



INTEGRATING INFORMATION SCIENCE FOR SUSTAINABLE DEVELOPMENT

Topics and Trends

Ana Lúcia Terra
Mariângela Spotti Lopes Fujita
(Organizers)



**CULTURA
ACADÊMICA**
Editora

Integrating Information Science for Sustainable Development

Topics and Trends

ANA LÚCIA TERRA
MARIÂNGELA SPOTTI LOPES FUJITA
(ORGANIZERS)

Integrating Information Science for Sustainable Development

Topics and Trends

Marília/Oficina Universitária
São Paulo/Cultura Acadêmica
2025



**CULTURA
ACADÉMICA**
Editora

Director

Dra. Ana Clara Bortoleto Nery

Vice-Director

Dra. Cristiane Rodrigues Pedroni

Editorial Board

Mariângela Spotti Lopes Fujita (Presidente)

Célia Maria Giacheti

Cláudia Regina Mosca Giroto

Edvaldo Soares

Marcelo Fernandes de Oliveira

Marcos Antonio Alves

Neusa Maria Dal Ri

Renato Geraldi (Assessor Técnico)

Rosane Michelli de Castro

CIP – Cataloging-in-Publication

161 Integrating information science for sustainable development : topics and trends / Ana Lúcia Terra, Mariângela Spotti Lopes Fujita (organizers). – Marília : Oficina Universitária ; São Paulo : Cultura Acadêmica, 2025.

595 p. : ill.

Includes bibliography

ISBN 978-65-5954-623-7 (Impresso)

ISBN 978-65-5954-624-4 (Digital)

DOI: <https://doi.org/10.36311/2025.978-65-5954-624-4>

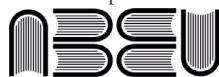
1. Information science. 2. Technological innovations. 3. Sustainable development. 4. Sustainable Development Goals. 5. Information literacy. 6. Information organization I. Terra, Ana Lúcia. II. Fujita, Mariângela Spotti Lopes.

DDC 020

Telma Jaqueline Dias Silveira – Librarian – CRB 8/7867

Imagem capa: <https://stock.adobe.com/br> - Arquivo "AdobeStock: 322263226 e 522279812". Acesso em 18/06/2025.

Affiliate publisher:



Associação Brasileira de
Editoras Universitárias

Academic Culture is the publishing imprint of UNESP Publishing
University Office is the publishing imprint of UNESP - Marília campus



This work is licensed under a Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License.

Scientific Committee of the Book

Alica Kolaric, University of Zadar, Croatia

Ariel Garcia, National Autonomous University of Mexico – UNAM, México

Carlos Candido de Almeida, São Paulo State University – UNESP, Brazil

Carmen Agustin-Lacruz, University of Zaragoza, Spain

Cibele Araujo Camargo Marques dos Santos, University of São Paulo – USP, Brazil

Fabio Assis Pinho, Federal University of Pernambuco – UFPE, Brazil

Fernando Vechiato, Federal University of Rio Grande do Norte – UFRN, Brazil

Gema Bueno-de-la-Fuente, University of Zaragoza, Spain

Isidoro Gil Leiva, University of Murcia, Spain

José Antonio Gomez Hernandez, University of Murcia, Spain

José Augusto Chaves Guimarães, São Paulo State University – UNESP, Brazil

José Eduardo Santarém Segundo, University of São Paulo - USP, Brazil

Kamelia Planska, University of Library Studies and Information Technologies - ULSIT, Bulgaria

Kornelija Petr Balog, University of Osijek, Croatia

Lídia Oliveira, University of Aveiro, Portugal

Luciane de Fátima Beckman Cavalcante, Federal University of Rio de Janeiro - UFRJ, Brazil

Maja Krtalic, Victoria University of Wellington, New Zealand

Maria Cláudia Cabrini Grácio, São Paulo State University – UNESP, Brazil

Maria João Antunes, University of Aveiro, Portugal

Maria Jose Jorente, São Paulo State University – UNESP, Brazil

Marta Lígia Pomim Valentim, São Paulo State University – UNESP, Brazil

Nadi Helena Pressler, Federal University of Pernambuco – UFPE, Brazil

Natália Bolfarini Tognoli, Federal Fluminense University – UFF, Brazil

Natalia Nakano, Faculty of Medicine of the Marília – FAMEMA, Brazil

Paavo Arvola, Tampere University, Finland

Paula Regina Dal'Evedove, Federal University of São Carlos – UFSCar, Brazil

Raimundo Nonato Macedo dos Santos, Federal University of Pernambuco – UFPE, Brazil

Roberta Cristina Dal'Evedove Tartarotti, State University of Campinas – UNICAMP, Brazil

Rogerio Mugnaini, University of São Paulo – USP, Brazil

Rosângela Formentini Caldas, São Paulo State University – UNESP, Brazil

Thomas Mandl, University of Hildesheim, Germany

Vania Mara Alves Lima, University of São Paulo – USP, Brazil

Walter Moreira, São Paulo State University – UNESP, Brazil

Table of contents

Presentation

Overviews from Information Science to Sustainability.....	15
<i>Ana Lúcia Terra</i>	
<i>Mariângela Spotti Lopes Fujita</i>	

Part I 21st Century skills and information profession

Green libraries: IFLA's actions and resources for sustainability and achieving the sustainable development goals	23
<i>Ana Carolina Silva Fonseca</i>	
<i>Sara Alexandra Rodrigues de Brito</i>	
<i>Liliana Isabel Esteves Gomes</i>	
Open Access Legal-Environmental Information Sources in Spain and Europe	41
<i>David Mercadal Cuesta</i>	
What conspiracy theories circulated on Twitter during the first wave of Covid-19 in France?	67
<i>Marc Tanti</i>	
Internet Censorship in Russia	79
<i>Marija Bitunjac</i>	
<i>Martina Dragija Ivanović</i>	

Records management in search of efficiency in the administrative archive of the archive of the university of Coimbra	<i>101</i>
<i>Isabel Cristina Guerra Correia Rostami</i>	

The Convergence of Digital Transformation and Sustainability: the Role of Information Professionals in Building a More Sustainable Future.....	<i>123</i>
<i>Janaína Fernandes Guimarães Polonini</i>	
<i>Carla Conforto de Oliveira</i>	
<i>Bárbara Souza da Silva</i>	

Part II

Digital transformation and sustainability

Information tools – integration into the librarian profession	<i>149</i>
<i>Elena Popova</i>	
<i>Sabina Eftimova</i>	

Sustainable development of library institutions through digital transformation.....	<i>161</i>
<i>Ivana Nikolova</i>	
<i>Elisaveta Tsvetkova</i>	

From pay to read to pay to publish: a new beginning for open access in Romania	<i>177</i>
<i>Ivona Olariu</i>	

Implications and challenges for the information professional: the use of text generators	<i>191</i>
<i>Janaína Fernandes Guimarães Polonini</i>	
<i>Bárbara Souza da Silva</i>	
<i>Carla Conforto de Oliveira</i>	

Records Manager facing the demands of sustainable development and personal data protection: two important issues of the 21st century	<i>209</i>
<i>Cecília Preciosa Cabsela</i>	
<i>Gildo Carlos Macie</i>	
<i>Sonia Maria Troitiño Rodriguez</i>	

Part III

Information Behavior and sustainability

Information Behavior at ICBAS - School of Medicine and Biomedical Sciences: an approach to sustainable development in the business landscape	231
<i>Andreia Carvalho</i>	
<i>Hélder Ferreira</i>	
<i>Inês Braga</i>	
Information literacy and sustainability in the context of implementing the National Records Management System (e-SNGD) in the Mozambican Public Administration	263
<i>Gildo Carlos Macie</i>	
<i>Telma Campanha de Carvalho Madio</i>	
<i>José Carlos Abbud Grácio</i>	
<i>Cecília Preciosa Cabsela</i>	
An overview of prominent topics on teaching Sustainability and Information Literacy	283
<i>Paula Grgić</i>	
<i>Mate Juric</i>	
Information literacy: university extension and contributions to Sustainable Development Goal.....	291
<i>Rita de Cássia Silva dos Santos</i>	
<i>Glória Maria Lourenço Bastos</i>	
<i>Tamara de Souza Brandão Guaraldo</i>	
<i>Celia Retz Godoy dos Santos</i>	
University extension as a field for information literacy actions for sustainability.....	315
<i>Marianna Zattar</i>	
<i>Nysia Oliveira de Sá</i>	
<i>Alberto Calil Elias Junior</i>	

Exploring the Information Sources of the Indigenous People of Terena (Brazil) considering the United Nations (UN) 2030 Agenda for the Safeguarding of Cultural Heritage	333
<i>Lilian Aguilar Teixeira</i>	
<i>Ana Lúcia Terra</i>	
<i>Oswaldo Francisco de Almeida Junior</i>	
<i>Antonio Hilario Aguilera Urquiza</i>	
Information behavior of Czech and Slovak students during the COVID-19 pandemic: a case of information hygiene	359
<i>Michaela Dombrovská</i>	

Part IV Libraries and education for sustainability

LIS programs and profession: an overview of Croatian and Portuguese students' perception and expectations	373
<i>Sanjica Faletar</i>	
<i>Ana Lúcia Terra</i>	
<i>Borna Petrović</i>	
<i>Martina Slobodanac</i>	
<i>Beatriz Chaiça</i>	
<i>Carolina Alves</i>	
Mapping of good practices in university libraries aligned with the development of digital competence from the perspective of the 2030 agenda,	391
<i>Alessandra Monteiro Pattuzzo Caetano</i>	
<i>Helen de Castro Silva Casarin</i>	
Smart Cities and the 2030 Agenda for Sustainable Development: considerations on public libraries' role in Brazilian National Policy on Smart Cities	419
<i>Camilla Castro de Almeida</i>	
<i>Elisabete Gonçalves de Souza</i>	

Permeability of the SDG Book Club in Portuguese Language in public policies towards reading in Brazil and Portugal.....	447
<i>Callu Ribeiro Ferreira Pedreira e Andrade Bamberg</i>	
<i>Juliana Marques Ramos</i>	
<i>Luciane Paula Vital</i>	
<i>Daniella Camara Pizarro</i>	

Part V

Knowledge organization to support sustainability

Knowledge Organization and Sustainability in Brazilian Information Science: from bibliographic systems to systematic reviews on innovation in environmental contexts,	475
<i>Graciane Silva Bruzinga Borges</i>	
<i>Gercina Ângela de Lima</i>	
<i>Gustavo Silva Saldanha</i>	
Decolonial practices of Knowledge Organization: a Brazilian literature overview	503
<i>Admeire da Silva Santos Sundström</i>	
<i>Heloá Cristina Camargo de Oliveira</i>	
Indexing guidelines for self-archiving policies in institutional repositories in southern and southeastern regions of Brazil	523
<i>Franciele Marques Redigolo</i>	
<i>Fernanda Kelly Menezes Gonçalves</i>	
<i>Stela Andrade Vasconcelos</i>	
<i>Cecília Abrahão Nascimento de Santi</i>	
<i>Mariângela Spotti Lopes Fujita</i>	
Analysis of indexing language in Covid-19 subject representation	545
<i>Maria Carolina Andrade e Cruz</i>	
<i>Jessica Beatriz Tolare</i>	
<i>Mariângela Spotti Lopes Fujita</i>	

**Perspectives on preservation in digital libraries in the light of metadata:
paths for the sustainability of Luso-Brazilian heritage..... 573**

Gabriela Aparecida da Cunha Yamane

Fabiano Ferreira de Castro

Israel Guerra Yamane

Presentation

Overviews from Information Science to Sustainability

*Ana Lúcia Terra*¹

*Mariângela Spotti Lopes Fujita*²

In the face of global environmental challenges, Information Science is emerging as a powerful ally in the pursuit of sustainable development. *Integrating Information Science for Sustainable Development: Topics and Trends* examines the essential role of information professionals in addressing the United Nations Sustainable Development Goals (SDGs) and contributing to sustainability. This book serves as both a practical guide and a comprehensive analysis of how Information Science can be integrated into sustainable practices, with insights that span digital transformations, information behavior, knowledge organization, and more.

Divided into five key parts, the book explores the intersections between Information Science and sustainability from multiple perspectives, illustrating how libraries, information literacy, and digital tools contribute to building a sustainable future. Each part delves into the unique ways information professionals are adapting to the demands of the 21st century and contributing to environmental and social well-being across different cultural and institutional contexts.

¹ University of Coimbra, CEIS20 – Centre for Interdisciplinary Studies, Portugal.

² São Paulo State University (Unesp), Brazil.

<https://doi.org/10.36311/2025.978-65-5954-624-4.p15-20>

The opening section, titled “21st Century Skills and the Information Profession”, focuses on the evolving roles of information professionals as they adapt to sustainability-related responsibilities. This part begins with an exploration of green libraries, highlighting the actions of the International Federation of Library Associations and Institutions (IFLA) to integrate sustainability into library practices. Through these initiatives, libraries become agents for promoting sustainable development, providing resources, and fostering community engagement around environmental issues. The next chapter examines the availability of open-access legal and environmental information sources in Spain and Europe. These resources are critical for ensuring that both policymakers and the public have access to accurate information, which in turn supports informed decision-making for sustainability efforts. Following this, the book turns to the topic of misinformation, specifically addressing conspiracy theories circulated on Twitter during the first wave of COVID-19 in France. This discussion emphasizes the importance of information hygiene and responsible information management in times of crisis. Further chapters in this section explore topics such as internet censorship in Russia, revealing the challenges faced by citizens when accessing unbiased information, and the efficiency of records management in the administrative archive of the University of Coimbra. The section ends with a discussion on the convergence of digital transformation and sustainability, illustrating the role of information professionals in creating a sustainable digital future. In a rapidly changing digital landscape, information professionals are not only adapting to new technologies but also actively shaping the principles of sustainable information practices.

The second part of the book, “Digital Transformation and Sustainability”, delves into the digital transformation sweeping across libraries and information institutions, emphasizing the importance of these changes in supporting sustainable development. The section opens with a look at information tools that are becoming fundamental to the librarian profession, highlighting how digital skills reshape information practices. Digital tools allow libraries to enhance sustainability through efficient resource management, community outreach, and data-driven decision-

making. A chapter on the sustainable development of library institutions underscores how the Digital Library at the Library and Information Center of the University of Library Studies and Information Technologies – Sofia, Bulgaria, is incorporating information and communication technologies and demonstrates that digital transformation is a key element of the sustainability of any modern library. Another chapter discusses Romania's transition from "pay-to-read" to "pay-to-publish" models in open access, signalling a shift in how knowledge is disseminated. This movement supports equitable access to knowledge while fostering a more sustainable, open, and collaborative research environment. Next, the implications and challenges of using text generators in information services are explored, offering insights into the potential of AI in supporting sustainable information management while acknowledging the ethical considerations that come with such innovations. Lastly, the role of records managers in balancing sustainable development with personal data protection is examined, stressing the need for information professionals to handle sensitive data responsibly while contributing to a sustainable information landscape.

"Information Behavior and Sustainability" is the core of Part III, which explores the relationship between information behavior and sustainable development, focusing on how information literacy and access to information can influence sustainable practices. The first chapter examines information behavior at the School of Medicine and Biomedical Sciences (ICBAS) – Porto, Portugal –, analyzing how information literacy can contribute to sustainable development in business and health-related fields. By fostering information literacy, educational institutions can cultivate a generation of professionals who are not only well-informed but also committed to sustainable practices. The role of information literacy in Mozambique's public administration is another focus, where the implementation of the National Records Management System (e-SNGD) aims to streamline information processes and promote sustainability in governance. The following chapters offer an overview of prominent topics in teaching sustainability and information literacy, underscoring the importance of integrating these concepts into educational curricula to foster an informed citizenry. Further discussions

highlight university extension programs as platforms for promoting sustainability. These initiatives help students and community members develop information skills that support the SDGs, bridging academic knowledge with practical, community-based applications. A chapter on the information sources of the Terena Indigenous people in Brazil brings a unique perspective about the relevance of legal policies and international treaties in preserving cultural diversity and the right to access information, which is in line with the UN Sustainable Development Goals. The section concludes with a case study on the information behavior of Czech and Slovak students during the COVID-19 pandemic, underscoring the critical introduction of a new course, called Information Hygiene, into the Library and Information Science (LIS) curriculum to overcome misinformation and support public health.

In Part IV, *Libraries and Education for Sustainability*, the book examines the role of libraries and education in advancing sustainability literacy and awareness. Through an analysis of LIS programs in Croatia and Portugal, this section sheds light on students' perceptions of the field, their expectations, and their role as future information professionals. The section also explores the best practices of Brazilian university libraries to achieve the Sustainable Development Goals of the United Nations 2030 Agenda, and underscores that libraries are equipping patrons with the skills necessary for sustainably navigating the digital world. Another chapter considers the role of public libraries in Brazil's national policy on smart cities, exploring how these institutions can contribute to sustainable urban development and the need for law recognising their role as a fundamental public policy actor with objectives congruent with those of the 2030 Agenda. Lastly, the book discusses the SDG Book Club in Portuguese-speaking countries and its potential to shape public policies for reading. This initiative demonstrates how libraries and educational programs can cultivate a reading culture that aligns with sustainability goals, fostering awareness of social and environmental issues through literature.

Part V, titled "Knowledge Organization to Support Sustainability", is the final section of the book. It delves into Knowledge Organization as a foundational element for sustainable practices in Information Science.

The first chapter explores Knowledge Organization within Brazilian Information Science, discussing bibliographic systems and systematic reviews on innovation in environmental contexts. These systems not only facilitate access to information but also support the management and dissemination of sustainable knowledge. A chapter on decolonial practices in Knowledge Organization offers a critical perspective on how Brazilian Knowledge Organization has engaged with decoloniality over the past decade, focusing on its incorporation into theories, methods, and practices. Findings indicate that while the field has been slower to develop than in other countries, it is establishing a foundation centered on marginalized groups, including women, Afro-Brazilian communities, Indigenous peoples, and LGBTQ individuals. The next chapter investigates the self-archiving policies of institutional repositories in federal universities across Southern and Southeastern Brazil, with a focus on subject representation, keyword assignment, and controlled vocabularies. Results show that despite most of the repositories having self-archiving policies, improvements are needed in guidelines for effective information representation and retrieval. The section continues with a discussion on indexing language, focusing on subject representation during the COVID-19 pandemic, which underscores the importance of clear and accurate categorization in managing health-related information. Findings reveal that indexing languages offer more specific and hierarchically organized terms, while database subject categories tend to be broader and less systematically aligned with the central topic, retrieving documents from various fields. The book concludes by analysing metadata's role in preserving digital heritage. This final chapter, focuses on how the Luso-Brazilian Digital Library preserves rare book metadata through digitization, ensuring accessibility and alignment with W3C best practices for long-term heritage sustainability. By examining metadata standards, it highlights efforts to unify access and preserve the cultural memory of Brazil and Portugal through digital curation initiatives. By standardizing metadata practices, digital libraries can ensure the longevity and accessibility of valuable cultural resources, supporting the sustainability of both digital and physical heritage.

Throughout the book, readers will find a comprehensive collection of 27 chapters, authored by 66 contributors from 9 countries — Brazil, Portugal, Spain, France, Croatia, Bulgaria, Romania, the Czech Republic, and Sweden — representing over 20 academic and research institutions. These 27 chapters are selected papers from the presentations given at the 32nd BOBCATSSS Conference held at the University of Coimbra, Portugal, from January 23rd to 25th 2024, and co-organized by the State University of São Paulo – UNESP, Marília, Brazil, and the University of Library Studies and Information Technologies – ULSIT, Sofia, Bulgaria. The name BOBCATSSS is an acronym representing the university network, with each letter denoting the initial letters of the cities where the universities that initiated the BOBCATSSS symposium are located: Budapest, Hungary; Oslo, Norway; Barcelona, Spain; Copenhagen, Denmark; Amsterdam, Netherlands; Tampere, Finland; Stuttgart, Germany; Szombathely, Hungary; and Sheffield, England. Since the 1990s, the BOBCATSSS conferences have been notable for the strong engagement of the host universities' Library and Information Science students, fostering a uniquely dynamic and vibrant atmosphere. The conferences were initially organized under the auspices of EUCLID (European Association for Library & Information Education and Research), which was renamed BOBCATSSS Association in 2019, acknowledging the name's wider recognition.

Integrating Information Science for Sustainable Development: Topics and Trend presents a forward-thinking exploration of how information professionals can support sustainability in an increasingly digital, interconnected world. Through diverse topics, case studies, and innovative practices, this book serves as a vital resource for information professionals, educators, and researchers committed to building a sustainable future through knowledge and collaboration.

Part I

21st Century Skills and

Information Profession

Green Libraries: IFLA's actions and resources for sustainability and achieving the Sustainable Development Goals

*Ana Carolina Silva Fonseca*¹

*Sara Alexandra Rodrigues de Brito*²

*Liliana Isabel Esteves Gomes*³

ABSTRACT: The concept of a “green library” has been discussed since the 1990s and is associated with the activities that libraries carry out to minimise the negative human impact on the natural environment. This research aims to analyse the role of the International Federation of Library Associations and Institutions (IFLA) in promoting green libraries. The methodology adopted includes research and analysis of the IFLA website. The results show that this institution has been promoting and disseminating the issue through various initiatives. These include the creation of the IFLA Environment, Sustainability, and Libraries Section (ENSULIB) in 2021, the Green Library definition webpage, and the IFLA Green Library and Green Library Project awards. Open-access reference publications are also available in the IFLA repository. Educational actions and projects that unite librarians from all over the world in favour of sustainability and the achievement of the Sustainable Development Goals (SDGs) are also supported by IFLA. It is concluded that IFLA highlights the role of libraries in sustainable development and encourages them to actively decrease emissions, promote sustainable economy and

¹ University of Coimbra, Coimbra, Portugal.
E-mail: acarolinafonseca0@gmail.com | ORCID iD <https://orcid.org/0009-0009-5048-3833>

² University of Coimbra, Coimbra, Portugal.
E-mail: ssbrito2003@gmail.com | ORCID iD <https://orcid.org/0009-0006-2479-3860>

³ University of Coimbra, Centre for Interdisciplinary Studies – CEIS20, Coimbra, Portugal.
E-mail: liliana.gomes@fl.uc.pt | ORCID iD <https://orcid.org/0000-0003-3786-2942>

provide library services with a focus on social sustainability. ENSULIB is increasingly promoting libraries' commitment to the implementation of the goals of the United Nations 2030 Agenda and SDGs.

KEYWORDS: Green Libraries, International Federation of Library Associations and Institutions, IFLA ENSULIB Section, Sustainable Development Goals.

INTRODUCTION

The 17 United Nations' Sustainable Development Goals (SDGs) adopted in 2015 represent a global call to action for eradicating poverty, protecting the planet, and ensuring peace and prosperity by 2030. To achieve these goals, all institutions, including libraries, must prioritize sustainability.

Over the past few decades, libraries have showcased their dedication to environmental sustainability, raised awareness about social sustainability, and taken a leadership role in environmental education. They serve as examples of sustainable buildings and practices, educate the public on sustainability literacy, and support research and activities related to sustainability.

Founded in 1927, the International Federation of Library Associations and Institutions (IFLA) is “the global voice of libraries, representing the interests of the profession and working to improve services worldwide” (IFLA, 2024a). As IFLA is the most important global association for libraries, its website is a source of information for librarians, community stakeholders, local government agencies, policy makers and educational institutions.

Given its global reach and its mission to connect libraries, librarians and information professionals around the world, the IFLA website is a valuable resource for various topics related to libraries and information in general, and to the subject of this research, green libraries.

BACKGROUND AND PURPOSE OF THE RESEARCH

The concept of a “green library” has been discussed since the 1990s and is associated with the activities that libraries carry out to minimise

the negative human impact on the natural environment. Nevertheless, the term cannot be limited to buildings. According to the IFLA Environment, Sustainability, and Libraries Section (ENSULIB), a “green library” is synonymous with a green and sustainable library, i.e., a library that takes environmental, economic, and social sustainability into account. These libraries can be of any size, but they must have a clear sustainability agenda that includes: “green buildings and equipment, green office principles, sustainable economy, sustainable library services, social sustainability, environmental management and commitment to general environmental goals and programmes” (IFLA ENSULIB, 2022).

Within this context, green libraries “also focus on services, activities, events, literature and projects related to any kind of sustainability that follows the United Nations Agenda 2030, demonstrating the social role and responsibility of libraries as leaders in sustainability education” (Hauke, 2019, p.1).

A simple search for “green libraries” or related terms returns a significant number of research articles, news, stories, and blog posts. Websites like “Green Libraries” (North America) and “Green Libraries Manifesto” (United Kingdom) offer resources and best practices for library greening. Using academic databases, we can analyse published papers on green libraries, tracking trends in authorship, citations, and publication dates. Overall, the growing scientific production about green libraries reflects a vital and expanding field.

Since IFLA is a global organisation that connects libraries, librarians, and information professionals worldwide, this research aims to analyse the role of the IFLA in promoting green libraries. Based on this objective, the research questions are: What is the IFLA’s involvement in promoting green libraries? What are the key initiatives that IFLA has implemented to promote green libraries?

Researching IFLA’s actions in this area or topic can provide valuable insights considering their influence as an international organisation, their advocacy and collaboration efforts, their resource allocation, and their impact on the entire library community.

RESEARCH METHODS AND INSTRUMENTS

This research is exploratory in nature, using a qualitative approach. The methodology used includes research and analysis of the IFLA website between November 2023 and January 2024. The collected information was analysed to synthesise and summarise the key initiatives that IFLA has developed and implemented to promote green libraries. The IFLA institutional repositories were also searched using the following filters: In the “Topic” field the key word used was the term “Green Libraries”, and in the “Type” of publication and “Unit” all resources were selected.

RESULTS FROM THE RESEARCH ON THE IFLA WEBSITE

From the research and analysis carried out, we can perceive that IFLA has been promoting and disseminating the issue through various initiatives, which we highlight below.

IFLA created the ENSULIB Section in January 2021, which had previously been the Environment, Sustainability, and Libraries Special Interest Group (IFLA ENSULIB, 2021). ENSULIB aims “to encourage librarians to inspire their communities into more environmentally sustainable way of action” worldwide, “by providing materials on green librarianship, giving voice to green librarians and library projects worldwide, leading by example, and offering a discussion forum” (IFLA, 2023a).

Knowledge hubs are essentially centralised locations where information, resources, and expertise on a specific topic are collected, organised, and disseminated. IFLA has a virtual knowledge hub that plays a vital role in knowledge sharing, collaboration, and learning about green libraries. A page on the IFLA website that defines a “Green Library” and explains how it may be an active and important part of sustainable development is available for viewing. Green and sustainable libraries should have a sustainability agenda which includes (figure 1):

Figure 1: Green and sustainable libraries

Topic	Description
Green buildings and equipment	Actively reducing the carbon footprint of library buildings and equipment.
Green office principles	Implementing environmentally sustainable operational routines and processes.
Sustainable economy	Promoting restrained consumption, advancing circular and sharing economy practices, and making them accessible to the community.
Sustainable library services	Ensuring easy access to relevant and up-to-date information for users, offering environmental education, and maintaining efficient operations with a positive carbon handprint.
Social sustainability	Focusing on good education, literacy, community engagement, cross-cultural diversity, social inclusion, and overall participation while actively working to reduce inequality.
Environmental management	Setting SMART (Specific, Measurable, Achievable, Realistic, and Timebound) environmental goals, minimising the library's negative impact on the environment, and communicating results and policies to a broader audience.
Commitment to general environmental goals	Guided by the UN Sustainable Development Goals, the Paris Climate Agreement, and related environmental certificates and programmes.

Source: Elaborated by the authors based on IFLA Section Environment, Sustainability and Libraries, 2022.

The ENSULIB Section “Green Library Website” also includes guides or checklists for libraries to evaluate their sustainability practices, a “What is a Green Library?” poster template, information about Green Library Tools and the International Green Library Bibliography in cooperation with the German Green Library Network” (IFLA ENSULIB, 2023).

The Green Library Checklists are a set of guidelines that provide a list of actions that libraries can take to become more environmentally sustainable. The “Sustainable buildings, equipment, and management. A checklist” (figure 2), originally published in German/English in “The Green Library = Die grüne Bibliothek. The challenge of environmental sustainability” (Hauke, Latimer & Werner, 2013), cover topics such as green buildings and equipment, green office principles, sustainable library services (Werner & Latimer, 2014).

Figure 2: The Green Library Checklists Project

The Green Library Checklists Project

The Green Library Checklist, "Sustainable buildings, equipment, and management. A checklist" was originally published in German/English in: *The Green Library = Die grüne Bibliothek. The challenge of environmental sustainability* / ed. on behalf of IFLA by Petra Hauke, Karen Latimer and Klaus Ulrich Werner. München/Boston: De Gruyter Saur, 2013. VIII, 433 pp., ill. (IFLA Publications, 161) ISBN 978-3-11-030972-0. Available online, as open access/under an open access license.

The Checklist is available in the following languages: German/English (original)

Translations:

Arabic — Catalan — Chinese — Croatian — Czech — Farsi(Persian) — Finnish — French — Greek — Hebrew
— Hindi — Hungarian — Indonesian — Italian — Norwegian — Polish — Portuguese — Punjabi —
Romanian — Russian — Serbian — Slovenian — Spanish — Swahili — Swedish — Thai — Turkish — Usbek

Source: <https://www.ifla.org/the-green-library-checklists-project>

The Green Library Tools, or Toolbox is a project by the ENSULIB that aims to provide resources and stories for library professionals to get involved with sustainability in libraries. The project (figure 3) includes five sections: clarifying concepts, international framework, resources, green libraries in the world, and annual international days. The resources include books, articles, videos, repositories, games, and blogs; the green libraries in the world include networks and inspiring experiences of sustainable libraries in different countries in their own language. The annual international days are selected International Days of the United Nations related to the environment and connected with the Sustainable Development Goals of the 2030 Agenda (IFLA ENSULIB, 2022).

Figure 3: Tools for Green Libraries



Source: https://www.ifla.org/wp-content/uploads/GreenLibsTools_v01_202210-1.pdf

According to Hauke (2019), the IFLA Green Library Award (figure 4) was established in 2015 by ENSULIB, IFLA's Environment, Sustainability and Libraries Special Interest Group, and is sponsored by the German publishing house de Gruyter Saur. "Following the IFLA Statement on Libraries and Sustainable Development, the award will help to advance the profession through illuminating the role of libraries and librarians in the advancement of sustainability standards and the promotion of specialized knowledge within professional practice" (Hauke, 2019, p.2).

Figure 4: IFLA Green Library Award logo



Source: <https://www.ifla.org/g/environment-sustainability-and-libraries/ifla-green-library-award>

The objectives of the IFLA Green Library Award are: "to reward the best Green Library submission that communicates the library's commitment to environmental sustainability; to create awareness of libraries' social responsibility and leadership in environmental education; to support the worldwide Green Library movement concerned with environmentally sustainable buildings, environmentally sustainable information resources and programming, conservation of resources and energy; to promote the development of Green Libraries initiatives locally and worldwide; to encourage Green Libraries to actively present their activities to an international audience" (IFLA, 2023b).

The prize is awarded in two categories: Best Green Library and Best Green Library Project. Last year, in 2023, the first place of Green Library Award was given to EPM Library in Cucuta, Colombia, with the project "Education for Sustainable Development" (figure 5). According to IFLA

(2023b), this project deserved the award because it demonstrates “that sustainability is at the heart of their strategy and embedded in all their activities: storytime programmes, lectures, robotics/new technology, and business development”. Despite Colombia being a country with a low to medium income level, this library seeks to value the idea of continuous improvement with its projects in sustainable education.

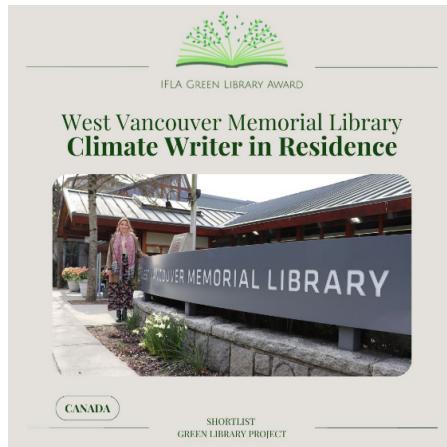
Figure 5: Green Library Award - EPM Library



Source: <https://www.facebook.com/photo.php?fbid=679799794190690&set=pb.100064820255732.-2207520000&type=3>

In the Best Green Library Project category, the 2023 winner was the West Vancouver Memorial Library in Canada with the project “Climate Writer in Residence at the West Vancouver Memorial Library: A Novel Solution” (figure 6). According to IFLA (2023b) this project deserves to win this award for “its innovative contribution that combines literature and climate in a unique way, creating education programs for sustainable development that involve the entire community through a variety of events. In addition, effective energy-saving measures have led to a greener design of the library itself.” This programme impacts not only its local users but also hopes to be a model for other libraries globally (IFLA, 2023b). Since 2022, a Climate Writer in Residence inspires community engagement on climate issues through writing.

Figure 6: Best Green Library Project - West Vancouver Memorial Library



Source: <https://www.facebook.com/photo.php?fbid=691873292983340&set=pb.100064820255732.-2207520000&type=3>

The IFLA ENSULIB Newsletter, published twice a year since December 2021, “reviews ENSULIB’s activities and achievements and provides a platform for presenting interesting stories, events or projects from libraries all over the world, which follow a clear green and sustainable commitment” (IFLA, 2022).

Since 2022, IFLA has been organising free webinars, available online, on the topics related to the green and sustainable libraries and library projects, the SDGs, and other relevant emerging trends.

ENSULIB has, since 2009, held meetings and programmes at the “IFLA World Library and Information Congress” (figure 7) about environmental, economic, and social sustainability in all areas of libraries and librarianship.

Figure 7: IFLA World Library and Information Congress



Source: <https://www.ifla.org/congress>

IFLA supports the SDGs stories for the Library Map of the World (figure 8). This Map provides “national level library data across all types of libraries in all regions of the world”. In addition to data, on this Map we can “learn how libraries contribute to the 17 United Nations Sustainable Development Goals (SDGs) by exploring stories by selected country or SDG”. Many libraries have programmes or activities that relate to the SDGs. “Each SDG story consists of the short description of activity, project or programme and its impact on community as well as links to additional information, pictures and videos” (IFLA, 2024b). ENSULIB also helps green libraries share their stories on the IFLA SDG website, boosting IFLA’s visibility and communication.

Figure 8: IFLA Library Map of the World



Source: <https://librarymap.ifla.org/stories>

IFLA is, also, currently developing guidelines for green and sustainable libraries that will offer specific recommendations and best practices applicable to libraries and information centres. By implementing these guidelines, libraries can showcase their dedication to environmental responsibility, raise awareness about green and sustainable issues, drive positive change within their communities, prioritize diversity, equity and inclusivity, and contribute to a more sustainable future (IFLA ENSULIB, 2023).

RESULTS FROM THE RESEARCH ON THE IFLA REPOSITORIES

The IFLA Library consolidated IFLA's digital resources into a single online location for ease of accessibility, search, and browsing for those interested in library and information science, available at: <https://library.ifla.org>. Here, between 2013 and 2019, we identified 17 results on the theme of "green libraries", corresponding to papers presented at the IFLA "World Library and Information Congress".

The IFLA Repository hosts various collections that can be explored by researchers, librarians, and information professionals for insights and resources, available at: <https://repository.ifla.org>. At this time, between 2009 and 2023, we identified 71 results (figure 9) on the theme "green libraries". Related subjects are also relevant, such as: Sustainability (52 results), Environment (33 results), UN Sustainable Development Goals (26 results), Environmental sustainability (23 results), Green buildings (16 results), Green collections (8 results).

IFLA has several open-access publications available about the topic "green libraries", among them (figure 7): Articles (17); Event Materials (19 resources); Posters (16 resources); Brochures (28 resources); Serials (3 resources).

Figure 9: IFLA Repository

Resources

Explore IFLA Standards, key publications, and core documents and more! All Resources are drawn from our ever-expanding institutional repository.

71 resources

Filter resources	
Type	<input type="button" value="All"/>
Topic	<input type="button" value="Green libraries"/>
Unit	<input type="button" value="All"/>

Minutes of Meeting: Environment, Sustainability and Libraries Section, 22 September 2023
2024-01-11
From: Environment, Sustainability and Libraries Section

Trajnostne zgradbe, oprema in upravljanje
2024-01
From: Environment, Sustainability and Libraries Section

BiblioVerde, un espacio para la co-construcción de la educación ambiental desde las bibliotecas públicas y escolares en la ciudad de Santa Clara, Cuba
2023-12-13
Se expone la experiencia de la implementación del proyecto de educación ambiental y comunitario BiblioVerde, que desar...

Source: <https://www.ifla.org/resources>

Examples of book publications are: “Going Green: Implementing Sustainable Strategies in Libraries Around the World” (Hauke et al., 2018); “New Libraries in Old Buildings: Creative Reuse” (Hauke et al., 2021).

The publication “Going Green: Implementing Sustainable Strategies in Libraries Around the World” (Hauke et al., 2018) provides a comprehensive guide to implementing sustainable strategies in libraries. The book covers topics such as green buildings, management, programmes, and services. The volume collects various contributions ranging from general questions to concrete case studies and is available not in the IFLA repository but in the following link with Open Access: <https://edoc.hu-berlin.de/handle/18452/23895>.

The book “New Libraries in Old Buildings” focuses on difficulties and opportunities in revitalisation of old, derelict, or abandoned buildings

into a library and investigates the transformation of buildings that originally had a different purpose. The publication shows worldwide best practice examples from different types of libraries in historic environments, both urban and rural, while maintaining a focus on sustainability concerning the architecture and interior design.

Related to the IFLA Repository and the IFLA Library, they serve distinct but complementary roles. The IFLA Repository includes a broad range of digital resources, such as documents, reports, publications, and other materials produced by IFLA and its working groups. Its main objective is to facilitate access to, and dissemination of information generated by IFLA, promoting collaboration and knowledge sharing within the global library community. In contrast, the IFLA Library is specifically focused on the papers presented at the IFLA World Library and Information Congress and other digital resources and metadata related to these events. Launched in 2013, the IFLA Library acts as the institutional repository of IFLA, centralising access to conference documents and ensuring they are easily searchable and downloadable. This repository is continuously growing, adding both existing and new resources.

In terms of content volume and scope, the IFLA Repository covers a wider range of document types compared to the IFLA Library, which is more specialised in conference-related documents. Both repositories aim to enhance the accessibility of IFLA's outputs, with the IFLA Library concentrating on conference materials while the IFLA Repository offers a more comprehensive collection of IFLA's digital resources.

REFLECTION ON THE FINDINGS

On the one hand, in this exploratory research several IFLA initiatives were highlighted, including the creation of the ENSULIB Section, the Green Library webpage or website, the IFLA Green Library Award to libraries and projects, and the open-access publications on the theme "green libraries" and related subjects. Our study encompasses the following key findings accompanied by a succinct overview and our perspective for further research (figure 10).

Figure 10: Analysis of the main results from the authors' perspective

Findings	Description	Author's perspective
Creation of the ENSULIB Section	ENSULIB section aimed at underscores IFLA's dedicated focus on sustainability.	A comprehensive evaluation is warranted to determine its broader impact on libraries worldwide.
Green Library webpage	IFLA's online resource serves as a central hub for information, tools, guidelines, and inspiration related to sustainable library practices.	A comprehensive understanding of how libraries worldwide benefit from these valuable resources requires further research, e.g. through case studies of libraries that actively use them, interviews with librarians and patrons to understand how these resources have influenced their practices, by analysing website usage data to determine which resources are most accessed.
Green Library and Green Library Project Awards	These annual awards recognize outstanding green library initiatives.	While these accolades illuminate commendable practices, efforts to enhance the visibility and dissemination of best practices could be explored further.
Open-access Publications	Publications available for free, covering various aspects of sustainable library practices.	These resources are crucial for knowledge sharing, however assessing the level of engagement and utilization by library professionals could provide valuable insights.

Source: Elaborated by the authors.

On the other hand, we have confirmed the perception that we had, i.e., that IFLA plays a crucial role in promoting information sharing and collaboration on green library initiatives. IFLA actively fosters information sharing and collaboration for green library initiatives through a range of strategies which we decided to group into five categories – Knowledge Hub; Capacity Building and Networking; Advocacy and Awareness Raising; Collaboration – with the following characterisation:

Knowledge Hub:

- **ENSULIB Section webpage:** This dedicated section provides resources, case studies, reports, guidelines, and best practices. The webpage on the IFLA website is a virtual knowledge hub that facilitates communication and knowledge exchange

between libraries worldwide, enabling them to share experiences and learn from each other's green initiatives.

- Capacity Building and Networking:
- Webinars and Conferences: IFLA regularly organises webinars and conferences dedicated to green libraries, providing opportunities for professionals to learn, share knowledge, and build networks.
- Regional and National Activities: IFLA collaborates with regional and national library associations to organise workshops, training sessions, and events focused on green library practices tailored to specific contexts.
- Mentorship Programmes: IFLA facilitates mentorship programmes connecting experienced libraries with those starting their green journey, fostering knowledge transfer and capacity building.
- Advocacy and Awareness Raising:
- Policy Statements and Campaigns: IFLA advocates for policies and initiatives that support sustainable library practices at the national and international level.
- Awards and Recognition: IFLA recognises outstanding green library initiatives through awards and programmes, promoting best practices, and inspiring others.
- Public Engagement: IFLA works to raise public awareness about the importance of sustainable libraries and their role in promoting environmental literacy and action.
- Collaboration:
- Connecting libraries with relevant stakeholders: such as green building experts, environmental organizations, and government agencies.
- Supporting research and development: by providing funding opportunities and hosting research forums.

- Promoting open access: to ensure that knowledge and resources on green libraries are widely available and accessible.

By employing these strategies, IFLA plays a significant role in fostering a global community of practice for green libraries, accelerating progress towards environmental sustainability in the library sector.

CONCLUSION

Conducting research on the IFLA website and their initiatives related to green libraries was both relevant and important, namely because: IFLA's policies and guidelines impact library practices globally; Researching IFLA's resources for green libraries helped to identify available tools, guidelines, and best practices; IFLA's advocacy efforts can influence policymakers, funding agencies, and library stakeholders to prioritise sustainability; IFLA's actions impact the entire library community; researching their green library initiatives provides a global perspective on sustainable library practices.

The IFLA promotes the development of green library initiatives locally, regionally and worldwide. The ENSLUIB Section encourages and empowers libraries to promote and help the fight for sustainability and environmental protection in their communities.

We conclude that IFLA highlights the role of libraries in sustainable development and encourages them to actively decrease emissions, promote sustainable economy and library services, with a focus on social sustainability. ENSULIB is increasingly promoting libraries' commitment to the implementation of the goals of the United Nations 2030 Agenda and SDGs.

REFERENCES

Hauke, P. (2019). *Green libraries towards green sustainable development*. IFLA Library.
<https://library.ifla.org/id/eprint/2562/1/166-hauke-en.pdf>

Hauke, P., Charney, M., & Sahavirta, H. (2018). *Going green: Implementing sustainable strategies in libraries around the world: Buildings, management, programmes and services*. De Gruyter Saur. <https://doi.org/10.1515/9783110608878>

Hauke, P., Latimer, K., & Niess, R. (2021). *New libraries in old buildings: Creative reuse*. De Gruyter Saur. <https://doi.org/10.1515/9783110679663>

Hauke, P., Latimer, K., & Werner, K. (2013). *The green library: The challenge of environmental sustainability*. De Gruyter Saur. <https://doi.org/10.1515/9783110309720>

IFLA Section Environment, Sustainability and Libraries Section. (2022). *What is a green library?* https://cdn.ifla.org/wp-content/uploads/IFLA-GreenLibraryDefinition_English_2022Jan.pdf

International Federation of Library Associations and Institutions. Environment, Sustainability and Libraries Section. (2022). *Tools for green libraries*. <https://repository.ifla.org/handle/123456789/2310>

International Federation of Library Associations and Institutions. Environment, Sustainability and Libraries Section. (2023). *The green library website*. <https://www.ifla.org/the-green-library-website>

International Federation of Library Associations and Institutions. (2021). *About the Environment, Sustainability and Libraries Section*. <https://origin-www.ifla.org/about-environmental-sustainability-and-libraries>

International Federation of Library Associations and Institutions. (2022). *The IFLA ENSULIB newsletter project*. <https://www.ifla.org/the-ifla-ensulib-newsletter-project>

International Federation of Library Associations and Institutions. (2023a). *Environment, Sustainability and Libraries Section*. <https://www.ifla.org/units/environment-sustainability-and-libraries>

International Federation of Library Associations and Institutions. (2023b). *IFLA Green Library Award*. <https://www.ifla.org/g/environment-sustainability-and-libraries/ifla-green-library-award>

International Federation of Library Associations and Institutions (2024a). *About IFLA*. <https://www.ifla.org/about>

International Federation of Library Associations and Institutions. (2024b). *Library map of the world*. <https://librarymap.ifla.org/about>

Werner, K. U., & Latimer, K. (2014). *The green library: Sustainable buildings, equipment, and management - A checklist*. <https://repository.ifla.org/handle/123456789/1658>

Open Access Legal-Environmental Information Sources in Spain and Europe

*David Mercadal Cuesta*¹

ABSTRACT: Effective understanding and study of legal issues related to the environment require access to reliable and high-quality sources of information (mainly, legislation, case law, and doctrine). This article provides an organised presentation of the main Open Access sources of legal-environmental information in Spain and Europe.

It is an exploratory, descriptive and qualitative study, based on the practical experience of the author as a documentalist in an environmental law research centre. The article describes law and case law databases (the official bulletins), official institutions and public research centres, journals, blogs and bulletins. It is highlighted that there is no official database of environmental law, therefore it is necessary to search using the general sources of law.

In general, these sources provide access to official documents, or to information created or reviewed by experts, and they are regularly updated. Open Access to these sources is essential as it enhances transparency in the field of research in environmental law, in line with Sustainable Development Goals, resulting in an improvement in legal frameworks.

KEYWORDS: Information sources. Environmental law. Legal information. Environmental information.

¹ Centro Internacional de Estudios de Derecho Ambiental, CIEDA-CIEMAT (Soria, Spain); Universidad de Zaragoza (Zaragoza, Spain).

E-mail: 530676@unizar.es | ORCID iD <https://orcid.org/0000-0002-8228-9869>

<https://doi.org/10.36311/2025.978-65-5954-624-4.p41-66>

INTRODUCTION

The ISO 9000:2015 defines “information” as “meaningful data”, considering data as “facts about an object”, and object as “anything perceivable or conceivable”. However, data is just data; it is its cognitive use that gives it an actual meaning, turning it into useful information.

Legal information is “that generated in the creation, application, spreading or researching of Law” (Maciá Gómez, 1998). From this definition, it can be understood that legal information encompasses all that has been generated during the legislative process: from its creation to its application, including related documentation. Traditionally, legal information has been classified into three types:

- Legislative: law in its wider sense: rules, laws, decrees, rules, etc. Institutions are obliged to publish the promulgated dispositions through official bulletins, and this law is compulsory for all citizens of a region.
- Judicial: includes all the case law from any judicial body. Spanish jurisprudence is established by the rulings of the Supreme Court when at least two of these rulings interpret the law in the same way. Case law from other courts is considered minor jurisprudence; it does not settle a precedent but can be consulted for informational purposes (Gutiérrez Gutierrez, 2015). This category also includes official publications from the Consejo General del Poder Judicial (Rodríguez Benito, 2020) and other justice organisms (such as the European Court of Human Rights, ECHR, or the Court of Justice of the European Union, CJEU).
- Doctrine: legal doctrine refers to the intellectual works that review, criticise and/or improve the legal system, as well as those that analyse rulings from various courts, including theses, papers, monographs, reports, and similar works.

All this information is found in their equivalent documents and is stored in specialised primary information sources. Other authors (Páez

Maña, 1991; Mikelarena Peña, 2001) add a fourth category, “parliamentary information”, which pertains to the interventions of parliamentarians during sessions to draft legislation and other acts; however, this information can also be included under legislative information.

For the concept of environmental information, article 2 of the Aarhus Convention defines it as:

“any information in written, visual, aural, electronic or any other material form on:

- a) The state of elements of the environment, such as air and atmosphere, water, soil, land, landscape and natural sites, biological diversity and its components, including genetically modified organisms, and the interaction among these elements;
- b) Facts, such as substances, energy, noise and radiation, and activities or measures including administrative measures, environmental agreements, policies, legislation, plans and programmes, affecting or likely to affect the elements of the environment within the scope of subparagraph (a) above, and cost-benefit and other economic analyses and assumptions used in environmental decision-making;
- c) The state of human health and safety, conditions of human life, cultural sites and built structures, inasmuch as they are or may be affected by the state of the elements of the environment or, through these elements, by the factors, activities or measures referred to in subparagraph (b) above;”

Razquín and Ruiz de Apodaca (2007, p.123) synthesise the definitions from the Aarhus Convention into six summarized categories:

- a) Environmental elements (air, ground, landscape, biodiversity...).*
- b) Factors (physical or natural agents, substances...).*
- c) Measures (politics, administrative, rules, plans...).*
- d) Reports on the execution of environmental law.*

e) Economic analyses.

f) Health, civil protection and human conditions of living.”.

Environmental information is complex due to its own characteristics. Cueva Martín and Ginés Huertas (2010) highlight the following points:

- Complexity of the concept of “Environment” and the elements and mechanisms involved in it.
- Multidisciplinarity and interdisciplinarity produce a wide range of sources and dispersion.
- Terminological imprecision.
- Disparity among issuing organisations.

It is important to note that this study is focused on legal-environmental information, which can be defined as information involved in the legislative process, at any of its stages, that affects in any manner the elements or the environment we live in.

Ensuring Open Access to this information is crucial, as it contributes to the Sustainable Development Goals (especially 16.10, guarantee of public access to information). Furthermore, environmental information stands out for its cross-cutting nature, impacting a wide range of fields related to the SDGs and current challenges such as climate change or energy transition. Law serves as both a weapon and a tool to protect the environment and the planet we inhabit.

Reliable information sources are vital to enrich the quality of the information distributed in the media. There is a vast amount of environment-related content in news, radio or TV, but a lack of specialised information sources is noted (Cantero de Julián & Herranz de la Casa, 2023). Moreover, it is confirmed that the use of information sources can breed innovation and sustainability, even if there is still uncertainty of what sources should be used (González Silva & Belmar Castro, 2022). This is

why research on information sources is needed, to clarify which sources are reliable and of quality, and how they can be used.

By the 1990s, several studies had already examined sources of legal environmental information. Creagar (1991) offers a comprehensive handbook on international environmental law sources, from encyclopedias to judicial decisions, including guidelines for developing effective research strategies. Perkins Spyke (1995) compiles a list of secondary sources focused on federal environmental law in the United States. Additionally, Raeder (1997) explores websites that offer general environmental information, some of which include legal resources. However, these studies are now outdated, as the landscape of environmental law and information sources has evolved significantly since then.

In the Spanish context, there is a moderate amount of literature regarding legal information sources. Some studies have focused on legal information databases (Páez Mañá, 1991), official bulletins (Martínez Navarro, 2001), and general legal sources (Mikelarena Peña, 2001). Yet, there is a noticeable gap in the literature, with a lack of studies in subsequent years, until the works of Becerra Pérez and Botía Fuentes (2010), describing an information system for lawyers and clients during legal processes, and Borrajo Félez and Gaspar Fuentes (2011), focusing on an internal information portal for Aragonese parliamentarians. These two studies do not examine general information sources, but rather address specific information services or products for targeted users. More recently, studies by Gutiérrez Gutiérrez (2015), Rodríguez Benito (2020) and López Zamora (2022) have filled this gap, providing updated insights into legal information sources. There are also some studies focused on legal journals and research systems as an information source, such as Sá Osorio (2011), Andrés Aucejo (2017) or Mercadal Cuesta (2024).

There are also studies related to environmental information sources. Cueva Martín and Ginés Huerta (2010) offer a variety of resources (physical and digital) to study the environment in a broader sense, some of them with legal information. Ramos Simón, Arquero Avilés, Cobos Serrano, et al. (2013) examine the information needs of citizens through public administration offices, analysing the format and content of their

websites. There are also studies about environmental information from a bibliometric perspective (Oliveira & Valentim, 2022).

Nevertheless, our objects of study are not purely legal or environmental information sources, but information sources of legal-environmental content. In this context, the study of Drnas de Clément (2010) deserves special attention. The article aims to establish a formal corpus that underpins the theories of International Environmental Law, which, while rooted in Public International Law, possesses its own characteristics. From this legal framework, the relevant information sources can be identified as they serve as the foundation for constructing this system.

As stated, there is a need to effectively communicate environmental issues, and in the case of legal information, reliable and high-quality sources are essential for policymakers, researchers and communicators. While there are works on legal sources and environmental sources separately, there is a notable lack of research on legal-environmental information sources. This justifies the relevance of this paper, which presents and describes legal-environmental information sources, setting a starting point for those interested in the topic.

OBJECTIVES AND METHODOLOGY

The main goal of this paper is to identify the legal-environmental information sources that are Open Access and of interest for Spanish researchers or policy makers, as well as those European sources of great relevance.

As a secondary goal, the paper establishes a classification of these sources based on the content they provide, along with a brief description of each resource. This study is not intended to be exhaustive but may serve as an introduction for those interested in environmental law research. It is a general presentation that can be expanded according to individual need.

The elaboration of this paper has been structured in 3 phases:

- 1) Bibliographic exploration in both general and specialised databases.

- 2) Identification of the sources:
 - a. Selected from the bibliography.
 - b. Selected by the author based on their experience as a documentalist in a research centre in environmental Law.
- 3) Analysis and description of the selected resources.

The study includes the main public official sources that either create or disseminate legal-environmental information. Some private institutions have been included as they offer Open Access information free of charge. All the resources are digital and Open Access. The geographic scope of these sources is primarily Spanish, but some European sources have been included due to their relevance to the European background for lawmakers in Spain.

Each resource includes a brief description focusing on the content they provide and their general characteristics.

OPEN ACCESS LEGAL-ENVIRONMENTAL INFORMATION SOURCES

INSTITUTIONS

Spanish legal documents originate from the different branches of government: legislative, executive, and judicial.

Typically, laws are proposed by the government through the ministries or by Parliament. Parliament consists of two chambers: Congress and Senate. Congress can accept or reject laws proposed by the government and may also propose its own laws. Once approved by Congress, the proposal is sent to the Senate for review and final approval (or modification). Briefly, we can find different documents depending on their source. For example, Organic Laws originate from Parliament; Royal Decrees, Regulations or Ministerial orders come from the Central Administration; and Laws, Decree-Laws and Orders are issued by the

Autonomous Communities. The various courts (Supreme Court, National Audience, High Courts of Justice, Court of First instance and Offices) are responsible for proclaiming and publishing rulings, sentences and orders that constitute case law or jurisprudence.

In this research, the websites of the Spanish Government, Parliament and the various courts are omitted, in favour of specific institutions that are specialized in environmental law.

In Spain, there are two ministries with responsibilities related to the environment: the Ministry for the Ecological Transition and the Demographic Challenge (Ministerio para la Transición Ecológica y el Reto Demográfico, MITECO) and the Ministry of Agriculture, Fisheries and Alimentation (Ministerio de Agricultura, Pesca y Alimentación, MAPA). Ramos Simón et al. (2013) confirmed that online environmental information was abundant in the public institutions' websites, but the heterogeneity of the information was still an issue, making it difficult to access the information. They proposed a rearrangement of the websites, even mentioning that the valuable information offered by these ministries was hidden in the internet due to the abundance and repetition of sources.

Currently, these websites are better structured and a wide range of information can be found in the ministries' websites, including general information, cartographic information, Open Data databases, statistics, planning documents, economic information, authorities, employment, strategies, etc. There is also legal information, which is the focus of this analysis. Both ministries have a "Press room" section featuring official statements, news, agenda, and other information about their activities. Furthermore, regarding participation and access to justice, they maintain a list of open procedures subject to public information, and they both provide information services where users can request tailored information.

Starting with the MITECO, its responsibilities are divided into three areas, so the information presented is classified into the following sections:

- Energy
 - Energy efficiency

- Electric energy
- Nuclear energy
- Renewable energies, co-generation and waste
- Hydrocarbons and new fuels
- Mining and explosives
- Environment
 - Water
 - Biodiversity and forests
 - Environmental quality
 - Climate change
 - Coast and marine environment
- Demographic challenge
- Although there is legal information regarding each topic in each of the sections, there are a few sections of general interest:
 - Functions and structure.
 - Directory.
 - Recovery, Transformation and Resilience Plan (RTRP)
 - Strategic framework for Energy and Climate.
 - Plans, strategies, and roadmaps.
 - Legislative activity.

The first two sections enable citizens to fully understand the responsibilities and operational scope of the Ministry, as well as providing information about the personnel within the Ministry and the legislation that defines its structure and functions.

The next three sections inform citizens about current actions of relevance, focusing on topics such as the RTRP, energy transition or climate

change. Finally, the legislative activity section directs citizens to the various databases (mentioned below) where the different laws are published.

Continuing with the MAPA, the information they provide aligns with their actions, which are classified into the following topics:

- Agriculture
- Cattle industry
- Fisheries
- Alimentation
- Rural development

There is also a specific section for the Common Agricultural Policy of the European Union, presented from historical, technical, and legislative perspectives. Similar to the previous ministry, legal information can be found in each individual section. The legislative activity section is likewise similar, with links to the external databases. However, it also includes legislative compilations elaborated by the BOE on the topics pertinent to the MAPA's responsibilities.

It is worth mentioning that both ministries have libraries that are part of the Spanish Network of Environmental Libraries (Red de Centros de Información y Documentación Ambiental, RECIDA). This network is formed by more than 150 libraries across Spain, including university libraries, research centres, public libraries and other information centres related to the environment. RECIDA libraries provide access to information on demand and undertake initiatives such as publishing guides or educational activities, thereby adding a degree of transversality to the legal aspect of the environment. Even in the 1990s, the importance of frequent visits to libraries to check for new publications in the field of environmental law was highlighted by Perkins Spyke (1995). Today, however, it is not only about browsing the physical shelves but also paying attention to the digital resources that libraries increasingly offer.

Although we focused on these ministries, there are others such as the Ministry of Transport and Sustainable Mobility or the Ministry of Science, Innovation and Technology, which may also have useful information due to the transversality of environmental law.

Regarding the judicial aspect, the Attorney General's Office (Fiscalía General del Estado) has a specific Office for Environment (Fiscalía de Medio Ambiente). From 2006 to 2020, they published an Annual Report detailing the activities of the Office, classified by topic, which serves as a summary of the most significant events and cases managed by the institution.

European legal-environmental information comes from the analogous institutions for creating and executing law. In summary, the European Commission serves as the executive body and they have the right to initiate new laws. These proposals are then sent to the European Parliament and the Council of the European Union for review, approval, or rejection. Finally, the CJEU ensures the proper application of EU law, and it can be consulted by all the State members, EU institutions and citizens.

The website of the European Commission is organised by directorates, each following a similar structure and offering information about policies and legislation, including strategic documents, law proposals or the status of their implementation. They also offer statistical information, datasets, guides, technical reports, standards, publications, news and events. Within each section, content is classified by topic, facilitating access to the desired information. The relevant directorates for Environmental law are:

- Directorate – General, Agriculture and Rural Development
- Directorate – General, Climate Action
- Directorate – General, Energy
- Directorate – General, Environment
- Directorate – General, Maritime Affairs and Fisheries
- Directorate – General, Mobility and Transport
- Directorate – General, Regional and Urban Policy

The Council of the European Union shares its website with the European Council (European Consilium). This page offers a variety of information that is useful for environmental law researchers. On the “Topic” pages, they compile information about recent meetings, press releases, and policies related to the activity of both councils. Some relevant topics include: agriculture, climate neutrality, energy, environment, fisheries, regional development or transport. Of particular interest is the section “Research and publications”, which provides access to:

- Datasets on the Council’s public register; requests for public access to documents; and council votes on legislative acts.
- Reports and publications.
- Infographics.
- Research papers.
- Educational resources.

They also maintain a library and archive with a wide range of information resources relevant to the work of these councils. They offer as well access to databases for treaties and agreements, and legislative acts under the ordinary legislative procedure.

Although the European Parliament’s website does not have a specific environmental section, it offers information of interest regarding the legislative process in the European Union. They have created a “Legislative Train Schedule” (image 1), which visually displays the progress of legislative proposals. Some initiatives, such as “Sustaining our quality of life: food security, water and nature” (the fourth on the list) are of special relevance to environmental law, serving as a tool to stay updated on ongoing processes.

Image 1: Legislative train schedule of the European Parliament

Legislative Train Schedule							
EC Priorities		EP Committees		Commission 2024-29			
		Legislative initiatives	Announced	Tabled	Blocked	Close to adoption	Adopted / Completed Withdrawn
1	A NEW PLAN FOR EUROPE'S SUSTAINABLE PROSPERITY AND COMPETITIVENESS	①	☒	0	32	53	10 5 7 0
2	A NEW ERA FOR EUROPEAN DEFENCE AND SECURITY	①	☒	0	8	21	0 0 2 0
3	SUPPORTING PEOPLE, STRENGTHENING OUR SOCIETIES AND OUR SOCIAL MODEL	①	☒	0	5	11	2 0 1 0
4	SUSTAINING OUR QUALITY OF LIFE: FOOD SECURITY, WATER AND NATURE	①	☒	0	7	8	2 1 0 0
5	PROTECTING OUR DEMOCRACY, UPHOLDING OUR VALUES	①	☒	0	5	8	2 0 0 0
6	A GLOBAL EUROPE: LEVERAGING OUR POWER AND	①	☒	0	11	7	5 0 0 0

Lastly, the European Committee of the Regions is an advisory body with consultative functions, capable of making recommendations on legislative proposals providing a regional perspective. Although they cannot initiate legislative proposals, and do not have the right to approve or reject a law, they can be of great importance as they assess proposals and issue an opinion. It is structured in six commissions, two of them related to environmental law: Commission for the Environment, Climate Change and Energy, and the Commission for Natural Resources.

On their website, there are press statements, news, events, reports, publications and details on citizen participation. While some of these documents may not be strictly legal, they are of particular interest due to the significance of the institution that produces them.

Besides these institutions involved in the legislative process, there are three Spanish research centres that contribute to environmental law research by providing doctrinal articles, reports, papers, and scientific information from experts.

The first is the International Institute of Law and Environment (Instituto Internacional de Derecho y Medio Ambiente (IIDMA)), a private organisation declared to be of public interest, created in 1997 with the aim of contributing to sustainable development and environmental protection through legal analysis. They collaborate with the United Nations

and participate in various projects related to climate litigation. On their website they offer access to articles and reports, and they also maintain a blog (described below).

Secondly, the Tarragona Centre for Environmental Law Studies (Centre d'Estudis de Dret Ambiental de Tarragona (CEDAT)) is a research institute, founded in 2009, that belongs to the Universitat Rovira i Virgili, a Spanish public university. As a research centre, they focus on environmental law research, and they perform different tasks such as: formative activities, collaboration with universities, services to public administration and private companies, support for citizen platforms and NGOs, etc. Their researchers participate in different conferences and courses, and they publish articles and monographs. The CEDAT also publishes a journal (*Revista Catalana de Dret Ambiental*) and a newsletter (both described below).

Finally, we must mention the International Centre of Environmental Law Studies (Centro Internacional de Estudios de Derecho Ambiental (CIEDA-CIEMAT)), which belongs to the Research Centre for Energy, Environment and Technology (Centro de Investigaciones Energéticas, Medioambientales y Tecnológicas), dependant of the Ministry of Science, Innovation and Universities of Spain. This public research institution, established in 2005, is dedicated to the study and dissemination of environmental law. They maintain a strong digital presence, including a digital journal (*Actualidad Jurídica Ambiental*, described below) and active social media accounts on Twitter/X, and LinkedIn. The library houses approximately 5,000 books and provides access to journals and legal databases. It is also part of the RECIDA network, previously mentioned. The centre can be contacted for information about different environmental-legal topics. They also organise a range of online educational activities and their researchers publish their results in journals, reports, and other formats.

DATABASES

The databases presented here offer either official legislation and/or official case law emanated from the courts. It is important to note that

there is no legal public database focused on environmental law or case law (although some private initiatives exist), hence environmental information must be retrieved from general law databases.

Regarding legislation, meaning the officially published laws and regulations, at the European level it starts on the database Eur-lex. It serves as the comprehensive repository for EU legal texts, including all texts published in the Official Journal of the European Union (OJEU), as well as case law from the CJEU and the General Court. Other legal information can be found, such as international agreements, preparatory acts, official reports and communications.

The OJEU, aforementioned, is the official publication containing the new legislation and communications. The current version was established in 2003 with the Treaty of Nice, but it is an evolution of the *Journal Officiel de la Communauté Européenne du Charbon et de l'Acier*, which began in 1952. It is managed by the Publications Office of the European Union (same as Eur-lex). It is structured in two sections:

- Series L (legislation): EU secondary law (regulations, directives, decisions, opinions and recommendations) and international agreements.
- Series C (Information and notices): preparatory acts, announcements, summaries of judgments from the CJUE, reports, statements, etc.

While there is no specific section for environmental law in any of these resources, the advanced search function allows users to filter by the terms of the Eurovoc thesaurus, facilitating searches for specific topics.

In Spain, the equivalent of the OJEU is the Official Bulletin of the State (Boletín Oficial del Estado, BOE). The electronic version of the BOE has been published since 2009, but inherits content from *La Gazeta*, published between 1661 and 1959 (also digitised and accessible in the BOE database). It is divided into five sections, plus a section for the Constitutional Court.

1. General dispositions.
2. Authorities and personnel.
3. Other dispositions.
4. Justice administration.
5. Announcements.
6. Constitutional Court

The BOE website provides access to other databases, such as the constitutional jurisprudence, prosecutorial doctrine and opinions from the Council of the State. Whilst there is no specific section for environmental law, it is true that the Editorial BOE has published compilations that are regularly updated on many topics, including environment, water, energy, food and agriculture, and fisheries.

The BOE is replicated in all the Autonomous Communities and Provinces in Spain. Each of them follows a similar structure, and interested individuals must regularly check these official bulletins to stay up-to-date with the published information. Similarly, the Congress also has an official bulletin that compiles both official publications and the records of the sessions, although environmental content is scarce. There is a database that compiles all the legislation of the Autonomous Communities, called Calex, which offers an index by topics.

Case law can be found in the various resources mentioned earlier; however, there are also specific databases specialised in case law.

At the European level, the main database is Infocuria, an information service provided by the CJEU and the General Court. The CJEU offers bulletins and guides that feature select jurisprudence on specific topics on its website; however, there is no dedicated section for environmental case law. To locate relevant cases, users can filter the Infocuria database by already assigned topics.

The ECHR also has a database containing all of its rulings, HUDOC. While it allows searches by keywords, these are related to the different

articles and sections from the European Convention of Human Rights, meaning users must be familiar with reading case law and know precisely which article they wish to search for. On the ECHR's website there are also recordings of the hearings, organised by State and date, alongside other publications, statistical data, reports, and more.

In Spain, jurisprudential information is managed by the General Council of the Judiciary (Consejo General del Poder Judicial, CGPJ). The CGPJ guarantees the independence of the judiciary, can make proposals for judges, and is responsible for producing reports, amongst other functions. All the information is processed through the Judicial Documentation Centre (Centro de Documentación Judicial, CENDOJ), which handles both case law and rulings from various courts, along with other documents. The CENDOJ Database provides access to the case law from:

- The Supreme Court.
- The National Audience.
- High courts of justice
- Provincial Audiences
- Military and unipersonal courts.

The advanced search does not offer filters related to searching by topic, so users must either be specific with their keywords or know which ruling they are looking for, including the code number, date of ruling, or any identifying information.

As previously mentioned, the jurisprudence from the Constitutional Court is published in the BOE. However, it has its own database of jurisprudence, with a thesaurus and an ontology to filter the search by accepted terms.

In summary, none of these official bulletins and databases include sections specifically related to the environment, so users should be experienced or know exactly what they are seeking, as searches using natural language can sometimes yield inaccurate results due to the legal

vocabulary. For further analysis of these general sources, we suggest reading works such as Gutiérrez Gutiérrez (2015), Rodríguez Benito (2020) or López Zamora (2022).

JOURNALS

All the journals listed below (table 1) are digital and double-blind peer-reviewed. Four of them are fully Open Access, while the last one operates on a hybrid model, where some articles must be purchased, although each issue includes a selection of free or Open Access papers.

The average lifespan of these journals is 20 years, demonstrating a long-standing trajectory that guarantees their quality and reflects the interest of readers. It is noteworthy that the four Open Access journals are published by public institutions (universities and research centres). Although each journal may have a specific focus (Spain or Europe), they all publish works relating to the legal systems of other countries, both within and outside Europe. They publish two or three issues on average, aligning with the average frequency of Spanish law journals (Mercadal Cuesta, 2024).

We must highlight the journal *Actualidad Jurídica Ambiental*. According to Mercadal Cuesta (2024), the publications from this journal represent 10,52% of all the Spanish publications in law journals indexed in Scopus and Web of Science. It is published daily on weekdays, although a monthly compilation is released to facilitate access to the items published during the month. This frequency allows readers to stay updated on legislative and jurisprudential news more swiftly than in other journals, which typically publish two or three issues per year. Furthermore, in addition to articles, comments and book reviews, this journal features an Agenda section, providing information about seminars, courses and other events, as well as a Bibliographic References section, which offers a curated bibliographic repertoire, classified by topics, including thesis, books, chapters, and papers from other journals.

Table 1: Environmental Law journals.

Title	Publisher	Geographic scope	Creation date	Frequency	Content
Actualidad Jurídica Ambiental	Centro Internacional de Estudios de Derecho Ambiental (CIEDA-CIEMAT)	Spain, Ibero-America (specific section), International	2011	Daily	Articles, comments, notes, case-notes, book reviews, agenda, bibliographic references
Law, Environment and Development Journal	University of London and International Environmental Law Research Centre (IELRC) (Switzerland)	European, International	2005	Semiannual	Articles, case-notes, book reviews, other documents
Medio Ambiente & Derecho: Revista electrónica de Derecho Ambiental	University of Seville	Spanish, International	1998	Semiannual	Studies
Review of European, Comparative & International Environmental Law	John Wiley and Sons, Inc	European, International	1992	Quarterly	Articles, case notes, book reviews
Revista Catalana de Dret Ambiental	Generalitat de Catalunya and Centre d'Estudis de Dret Ambiental de Tarragona	Spanish, International	2010	Semiannual	Studies, notes, reports, book reviews

BLOGS

This section includes six blogs, primarily originating from private initiatives led by experts or institutions (table 2). The information they offer is both relevant and up-to-date, with most posts addressing significant issues in environmental law. These contributions are authored by knowledgeable experts or groups, and nearly all the blogs include an Agenda section that details various events related to environmental law.

The average lifespan of these blogs is 9,6 years. Even if they all have posted information within the last year, the posting frequency varies. Two of the blogs, *Blog de Derecho Ambiental* (CGAE) and *RADA*, have only posted once, in January 2023 and June 2023. This may suggest they are not regularly updated; however, the information presented in these blogs is of interest.

It is worth noting that the *AEPDA blog* focuses on administrative law, so it may include topics not directly related to environmental issues. Nevertheless, environmental law is a branch of administrative law, so related content is included. Additionally, the publishers of these blogs maintain a presence on social media, and readers are encouraged to follow them to stay updated.

Table 2: Environmental Law blogs.

Title	Publisher	Creation date	Last update	Content
Asociación Española de Derecho Administrativo (AEPDA)	AEPDA	2010	22/01/2024	Legislation, Case law, Agenda, News, Bibliographic references
Blog de Derecho Ambiental (Consejo General de la Abogacía Española, CGAE)	José Manuel Marraco – CGAE	2012	13/01/2023	Articles

Blog de Derecho Ambiental (IIDMA)	IIDMA	2018	27/12/2023	Articles, News, Agenda
Blog de la Red de Abogados y Abogadas para la Defensa Ambiental (RADA)	RADA	2016	Junio 2023	Agenda, News
Esdejusticia	Diego Gómez Fernández	2016	18/01/2024	Articles, News
Terraqui	Terraqui	2014	24/10/2023	Articles, News, Agenda

BULLETINS

Bulletins are secondary information sources for legal research, usually elaborated by libraries (Mikelarena Peña, 2001) or research institutions, with a great focus on the digital aspect. They can include just references or add a brief summary, index, or some other kinds of information.

All the bulletins listed below (table 3) present the latest legislation published in the official bulletins. Two of them also include significant rulings from different courts of justice. Most are released monthly, except for one that is issued weekly. Their average lifespan is 10 years, with the newest one being published in March 2023.

It should be noted that the CDAMAZ is also part of the aforementioned RECIDA network. In addition to this bulletin, it provides access to legal information on demand, in collaboration with other RECIDA libraries. The CDAMAZ bulletin stands out as the only weekly publication, which accelerates access to information compared to the monthly bulletins. Furthermore, it is the oldest bulletin at 19 years, and its coverage is more comprehensive than the others.

Table 3: Environmental Law bulletins.

Title	Publisher	Geographic scope	Creation date	Frequency	Content
Boletín de Actualidad Jurídica Ambiental	Ilustre Colegio de Abogados de Barcelona (ICAB) – Sección de Derecho Ambiental	International, Europe, Spain Catalonia	2023	Monthly	Legislation, Case law, Documents, Bibliographic references, News
Boletín del CEDAT	Centro de Estudios de Derecho Ambiental de Tarragona (CEDAT)	International, Europe, Spain, Catalonia	2009	Monthly	Recognition, Agenda, News, Legislation, Case law, Bibliographic references
Boletín de Legislación Ambiental	Comunidad de Madrid	Europe, Spain, Madrid	2018	Monthly	Legislation, Legal reports
Boletín legislativo semanal	Centro de Documentación del Agua y del Medio Ambiente de Zaragoza (CDAMAZ)	Europe, Spain, Aragon, Zaragoza	2005	Weekly	Legislation, Legal reports

CONCLUSION

This study has identified a diverse array of legal-environmental information sources available in Open Access, particularly relevant to Spanish researchers, while providing European context.

Government institutions, ministries and judicial bodies, both Spanish and European, play a vital role in generating, storing and disseminating legal-environmental information through their official websites. These platforms make information clear and accessible to users, offering specific legal insights into current environmental issues.

While the information displayed on these websites may appear redundant, the vast amount of legislation and jurisprudence produced daily necessitates the organization of this information into accessible formats. However, legislative and case law databases often lack the specialised tools needed to efficiently locate environmental documents, relying primarily on basic keywords or the Eurovoc thesaurus. This generalization can pose challenges for researchers and policymakers seeking relevant information. Although the BOE provides compilations by topic (with many of them related to the environment), such resources are not available on European databases, and case law databases require a certain level of jurisprudential knowledge for effective searching.

The research centres mentioned add a valuable insight to the field, promoting a deeper understanding of environmental legal issues. They not only serve as information repositories, but also maintain a variety of information products and services (journals, bulletins, publications and libraries) that make the complex subject of environmental law more accessible to the public, while still addressing a specialised audience.

The journals highlighted in this study have an average lifespan of 20 years, indicating their quality and sustained interest among researchers and readers. These journals are valuable for identifying relevant and popular topics based on the published works. They also provide extra information about formative activities, news, or latest publications. Notably, the journal *Actualidad Jurídica Ambiental*, with its daily publication schedule, stands out as one of the most relevant information sources.

Similarly, the blogs included offer insight into current topics of interest, with an average lifespan of 9,6 years, which also demonstrates a longstanding tradition. As the posts of the blog are signed by personal authors, they present different points of view, serving as forums to discuss complex issues.

While there is currently no dedicated Open Access database for environmental law, the bulletins described can aid in staying informed about newly enacted legislation and the latest court rulings. In particular,

the *Boletín legislativo semanal*, produced by the CDAMAZ, is significant due to its weekly publication schedule.

Finally, the importance of environmental libraries must be emphasised. The library of the CIEDA is the only one specialised in environmental law, while the libraries within the RECIDA network are focused on broader environmental topics. Some of these libraries feature sections or resources about environmental law that can be borrowed and exchanged throughout the libraries of the network.

In conclusion, while this research does not encompass the entirety of available resources, the included ones are some of the most useful and frequently used by the staff at a research centre focused on environmental law, affirming their quality and relevance. This paper serves as a starting point for further investigation into legal-environmental information, an area that, as demonstrated, remains largely unexplored. Thus, this work represents a preliminary approach to a broader study on this subject.

REFERENCES

Andrés Aucejo, E. (2017). La evaluación de la actividad investigadora en ciencias jurídicas: Hacia un impacto nacional y un impacto internacional en las ciencias jurídicas. *Revista de Educación y Derecho*, (16). <https://dialnet.unirioja.es/servlet/articulo?codigo=6147698>

Becerra Pérez, F. E., & Botía Fuentes, F. J. (2010). Sistema de información bajo plataforma web para la administración jurídica en el seguimiento de procesos legales (SIAP). *Vestigium Irei*, 3(1), 37-45. <http://revistas.ustatunja.edu.co/index.php/ivestigium/article/view/165>

Borrajo Félez, M. C., & Gaspar Fuentes, A. (2011). *EComisiones: El portal de información parlamentaria del Servicio de Documentación de las Cortes de Aragón*. [Apresentação de trabalho]. Actas de las XII Jornadas Españolas de Documentación: Una profesión, un futuro (pp.190-195). Fesabid, Malaga. <https://www.fesabid.org/wp-content/uploads/2022/05/2011-Malaga.pdf>

Cantero de Julián, J. I., & Herranz de la Casa, J. M. (2023). Cobertura de la información sobre medioambiente en medios de comunicación de España entre 2018 y 2021. *Revista Mediterránea de Comunicación*, 14(2), 17-34. <https://doi.org/10.14198/MEDCOM.24100>

Convention on access to information, public participation in decision-making and access to justice in environmental matters, done at Aarhus. (1998, June 25). *Denmark*. <https://unece.org/DAM/env/pp/documents/cep43e.pdf>

Creagar, E.O. (1991). Research Strategy and Sources for International Environmental Law. *Colorado Journal of International Environmental Law and Policy*, 2(1), 141-195. <https://heinonline.org/HOL/P?h=hein.journals/colenvlp2&i=201>

Cueva Martín, A., & Ginés Huertas, F. (2010). *Fuentes de información en medio ambiente*. Universidad de Valencia.

Drnas de Clément, Z. (2010). Fuentes del derecho internacional del medio ambiente. *RECORDIP*, 1(1). <https://revistas.unc.edu.ar/index.php/recordip/article/view/37>

European Parliament. (2025). *Legislative train schedule*. <https://www.europarl.europa.eu/legislative-train/>

González Silva, M., & Belmar Castro, C. (2022). Innovadores verdes: el uso de fuentes de información como factor diferenciador. *Journal of Management and Business Studies*, 4(1). <https://doi.org/10.32457/jmabs.v4i1.1935>

Gutiérrez Gutiérrez, A. (2015). Fuentes de información jurídica. *Derecho y cambio social*, 39. <https://dialnet.unirioja.es/servlet/articulo?codigo=5460669>

International Organization for Standardization. (2015). *ISO 9000:2015: Quality management systems: Fundamentals and vocabulary*.

López Zamora, P. (2022). Fuentes de información jurídica. In Martínez-Sicluna y Sepúlveda, C. (Dir.), *Habilidades prácticas para juristas* (pp. 43-53). Dykinson.

Maciá Gómez, M. (1998). *Manual de documentación jurídica*. Síntesis.

Martínez Navarro, V. (2001). *Las publicaciones oficiales conceptualización y tipología documental. Fuentes para su análisis y recuperación* [Tese de doutorado]. Universidad de Murcia.

Mercadal Cuesta, D. (2024). Análisis bibliométrico de las publicaciones en revistas españolas de Derecho en Web of Science (2018-2023). *Revista EDICIC*, 4. <https://doi.org/10.62758/re.4124>

Mikelarena Peña, F. (2001). Fuentes de información relativas a las obras de investigación jurídica. *Revista de Gestión Pública y Privada*, 6, 101-133. <https://drive.google.com/file/d/0B1FNRX3Pc5OsM0FjVmp4MUFJRTA/view?pli=1&resourcekey=0-vO7oPJrla1XckVQosm7Bsg>

Oliveira, H. V. de & Valentim, M. L. P. (2022). A ciência da informação e a produção científica brasileira sobre informação ambiental. *Revista Educación Superior y Sociedad*, 34(1), 877-897. <https://doi.org/10.54674/ess.v34i1.435>

Páez Maña, J. (1991). *Documentación jurídica: bases de datos* [Tese de doutorado, Universidad Nacional de Educación a Distancia].

Perkins Spyke, N. (1995). Making Sense out of Secondary Sources in Environmental Law: A Research Primer. *Environmental Law*, 25(1), 93-110.

Raeder, A. (1997). Environmental information sources on the net. *Searcher*, 5(2).

Ramos Simón, L. F., Arquero Avilés, R., Cobo Serrano, S. (2013). La información medioambiental en España: recursos y acceso a la información pública (1^a parte). *Revista Interamericana de Bibliotecología*, 36(3), 221-234. http://www.scielo.org.co/scielo.php?script=sci_arttext&pid=S0120-09762013000300005

Razquin Lizarraga, J. A. & Ruiz de Apodaca Espinosa, A. M. (2007). *Información, participación y justicia en materia de medio ambiente. Comentario sistemático a la Ley 27/2006, de 18 de julio*. Thomson Reuters – Aranzadi.

Rodríguez Benito, I. (2020). *Acceso a las fuentes de información jurídica mediante un escritorio virtual* [Trabajo de conclusão de curso, Universidad de Salamanca]. https://gredos.usal.es/bitstream/handle/10366/147111/TFG_InfyDoc_RodriguezBenito_o_Inmaculada_SI_95_2019-2020.pdf?sequence=1&isAllowed=y

Sá Osorio, A. M. de. (2011). Contributo das revistas jurídicas para a comunicação e criação de conhecimento: uma perspectiva bibliométrica [Tese de doutorado, Universidad de Alcalá de Henares]. <http://hdl.handle.net/10017/9823>

What conspiracy theories circulated on Twitter during the first wave of Covid-19 in France?

*Marc Tanti*¹

ABSTRACT: The Sars-Cov2 virus emerged in China in the Wuhan market on November 16, 2019. It quickly spread around the world causing the Covid-19 pandemic. Many epidemics that took place before this pandemic have been the source of many misinformation, conspiracy theories, post-truths and fake news. Our article aims to analyze the conspiracy theories that circulated on Twitter from March 1, 2020 to June 29, 2020 during this pandemic. Our methodology was qualitative. In particular, an interpretative descriptive analysis methodology was applied. The analysis data was extracted from Twitter with the Radarly® software. This tool permits to represent results in several forms (graphs, maps, clusters, etc.) and makes it possible to identify “influencers” and thematic of conversation. Our study highlights the circulation of numerous conspiracy theories. For example, in many tweets, the coronavirus would be an invention which would serve as a diversion and allow the discreet installation of 5G equipment. In our study, we can also cite the circulation of numerous fake news. For example, we can report the often relayed fake news of a virus manufactured in a laboratory. In conclusion, our analysis highlights during the Covid-19 epidemic, with the advent of the social web, conspiracy theories and fake news found a unique “breeding ground” for propagation. The boundaries of digital have become more and more subtle because manipulations have become more and more effective and have become invisible across these boundaries and in this cyberspace, where our privacy no longer belongs to us.

KEYWORDS: Covid- 19; Twitter; conspiracy theories

¹ Centre d'épidémiologie et de santé publique des armées CESPA- Marseille, France & Institut Méditerranéen des Sciences de l'Information et de la Communication IMSIC-AMU.

E-mail: mtanti@gmx.fr | ORCID ID: <https://orcid.org/0000-0001-6730-1463>

<https://doi.org/10.36311/2025.978-65-5954-624-4.p67-77>

INTRODUCTION

The Sars-Cov2 virus emerged in China in the Wuhan market on November 16, 2019. It quickly spread around the world crossing sea, land and air borders to cause the Covid-19 epidemic which was global and unprecedented. Scientific data on the virus and the disease quickly spread in cyberspace across digital borders, but also manipulated data and fake news. Their diffusion was significant through social networks.

Between reliable information, disinformation, post-truth or fake news, the digital frontiers have become, with the advent of this epidemic, subtle because tricks and manipulation have become more and more effective in making themselves invisible across these borders and into cyberspace.

A certain number of international studies have analyzed the diffusion of disinformation messages on the web during this epidemic.

For example, we can cite Wasim's study which analyzed the 5G conspiracy theory based on a content analysis of Twitter data over a period from March 27, 2020 to April 4, 2020, using the hashtag #5GCoronavirus (Wasim, 2020).

We can also cite the work of Kouzy who analyzed 673 information tweets whose scientific validity he verified. The author highlighted that 24.8 % of the tweets collected were disinformation and 17.4% contained unverifiable information (Kouzy et al., 2020). In this work, Kouzy concluded that medical misinformation about the epidemic was spreading at an alarming rate on social media and was having health, social and societal impacts.

This wave of false or misleading information on social networks also gave birth on February 2, 2020 to the concept of infodemic by Tedros Adhanom Ghebreyesus, director general of the World Health Organization (Mesquita et al., 2020).

Our article aims to present in a first time the dissemination of conspiracy theories that circulated on the social network Twitter from March 1, 2020 to June 29, 2020 via an analysis of tweets collected during

this period. In a second time, we will discuss the practical implications that could emerge from our work.

But before describing the research methodology and the results, we will first attempt to define the concept of conspiracy theory and what differentiates it from the concept of fake news.

STATE OF THE ART

Attempt to define the concept of conspiracy theories

Conspiracy theories have emerged more or less spontaneously in the public space in recent years, particularly following the attacks in Paris and Brussels (Giry, 2017). Also, it is not surprising that an epidemic of such magnitude as Covid-19 is at the origin of such phenomena. We can also note that conspiracy theories, although old phenomena, have for several years been the subject of particular attention, and even competition, in France, particularly between journalists, researchers and scientists and, finally, public authorities and professionals of politics

As for the French and European academic fields, beyond their pioneers, they are also crossed by an interdisciplinary vitality on this question and which brings them closer to the Anglo-Saxon world where “conspiracy theories” have been an object of study since the years 1960 at least (Butter & Reinkowski, 2014). This is reflected, for example, in the establishment of the “Comparative Analysis of Conspiracy Theories” action in 2016 or the holding of a thematic workshop during the annual congress of the French political science association in 2017 (Freiman, 2019). In addition, since 2010, journals such as Science and Pseudo-science, Agone, Raison Publique, Esprit, Diogenes, Emulations have published on conspiracy.

According to Fenster, conspiracy theories firstly reflect conviction profound, both deterministic and essentialist, that an “omnipotent group or individual, navigating on the margins of society, secretly controls, in whole or in part, the political and social order” (Fenster, 1999).

DIFFERENCE WITH THE CONCEPT OF FAKE NEWS

Popularized by Donald Trump during the 2016 electoral campaign to qualify his opponents and also the newspapers which are critical of him, the formula of “fake news” has spread through social networks and the media from year 2017, reaching peak attention in 2018.

If the expression “fake-news” is the one that is found in current vocabulary, it is interesting to look at its official translation decided by the Commission for the Enrichment of the French Language: “infox” (Ministère de L’Éducation Nationale, 2018)

Thus, the French Official Journal specifies the definition of this new phenomenon as: “false or deliberately biased information, spread for example to favor one political party to the detriment of another, to tarnish the reputation of a personality or a company, or to contradict an established scientific truth.” (Ministère de L’Éducation Nationale, 2018).

Far from being limited to the political domain alone, fake news would therefore contaminate the entire public space, attacking the reputation of individuals or brands as much as scientific facts (Allard-Huver, 2023).

The Anglo-Saxon expression “fake-news” specifies the notion of “falsity” of information, it does not necessarily imply negative intentionality. Indeed, many commentators on “fake news” insist on the need to differentiate between misinformation, i.e. the unfortunate sharing of incorrect information, and disinformation, i.e. mean the deliberate creation and sharing of false information (Wardle, 2017).

METHODOLOGY

This article follows a qualitative analysis methodology. In particular, for a better understanding of the situations encountered where the description of phenomena is essential, an interpretative descriptive analysis methodology is applied (Gallagher & Marceau, 2020).

The analysis data was extracted from the Radarly® software which allows you to record publications on social networks. The software also

makes it possible to draw qualitative and descriptive data. The tool is designed and marketed by the company Linkfluence (<https://radarly.linkfluence.com>) and operates in SAAS mode. The program is accessible online by paid subscription and allows us to collect data from Twitter, Facebook, Instagram, forums, blogs, etc.

The Radarly® software permits to represent results in several forms (graphs, maps, clusters, etc.). It also displays information about the tone of posted messages. It makes it possible to identify “influencers”, people or groups who intervene on a given subject or theme. Finally, it allows the export of data in .csv format to derive statistics. Data mining was mainly focused on Twitter. The period of extraction was from March 1, 2020 to June 29, 2020 (during the first epidemic wave in France). The social network Twitter has an important penetration rate in France during this period. Indeed, according to Business Insider FR on April 30, 2020, the number of daily Twitter users increased to 166 million during the first quarter of 2020, with an increase of 24% compared to the same period of 2019.

The languages questioned were mainly French and English.

A content analysis exploiting the inspection and knowledge representation functionalities offered by Radarly® was carried out. This analysis methodology makes it possible to identify information concerning the epidemic in the “torrential flood” of tweets (Negura, 2006).

To theoretically anchor this approach, the term “content” designates the information transmitted through discourse (Mainguenaud, 2009). The Palo Alto school contrasts it with the term “relationship”. We thus distinguish two types of content: manifest content and latent content, borrowed from the field of Freudian psychology. Manifest content is what is explicitly expressed: opinions, beliefs, etc. (Freud, 2012). In this sense, studying the content of a speech consists of bringing out its manifest content: the themes most often discussed, the key words, the positions taken and the arguments invoked to justify them (Clauzard, 2014). In this context, according to Albig (1952), content analysis is “a research technique for the objective, systematic and quantitative description of the manifest content of communications, with the aim of interpreting them”. According

to Mucchielli, analyzing the content of a document or a communication, “is searching for the information found there, extracting the meaning or meanings of what is presented there, formulating, classifying everything contained in this document or communication.” (Mucchielli, 1979). For Mucchielli, in “content analysis, the essential thing is the meaning and not the form. Its division will in principle be different from that of classical linguistics.” (Mucchielli, 2006).

In this analysis step, the filters integrated into the Radarly® software allowed us to sort and categorize the data by, for example, revealing the most popular tweets, and therefore the topics, on Twitter using the Clusters functionality. The software’s functionalities also allowed us to determine the influencers and their networks, the scope of action of these Internet users and the tone of the messages they convey.

RESULTS

Our study highlights the circulation of numerous conspiracy theories on Twitter during our period of analysis.

For example, in many tweets, the coronavirus would be - for a segment of the population - an invention which would serve as a diversion and allow the discreet installation of 5G equipment. For others, it is the waves emitted by these devices which would weaken the bodies of individuals and expose them to the coronavirus. The most extreme conspiracists even believe that Covid-19 is a direct consequence of this radio radiation deemed harmful and that it is transmitted only through them. However, we can note that Twitter is carrying out a massive cleanup of these publications in cyberspace, with increased attention to those that invite the sabotage of 5G antennas.

In another area, conspiracy theorists accuse, on Twitter, the Rothschilds of taking advantage of the epidemic for mercantile purposes. Others still assert that the virus does not exist but is intended for a universal vaccination campaign accompanied by electronic chipping.

We also find a video which is creating a buzz on the social network, in the form of a true-false television news and which explains that the virus responsible for Covid-19 is not natural, but was created by a laboratory financed by billionaire George Soros in order to annihilate the Chinese and Japanese populations. This video was posted online by the Swiss far-right conspiracy site Kla.tv and was, at the beginning of March 2020, among the most shared links in France on the social network. In this video, we find two fake medical experts, patents in biological engineering which have no relation to the subject, and a scientific study dating from 2007 that was deliberately misinterpreted.

With the health crisis, this practice, in conspiracy theories, has increased tenfold with the explosion of open platforms, such as BioRxiv, where numerous articles not validated by peers are posted, with studies that are much less solid and more subject to open to interpretation or doubt (Moatti, 2013). For example, at the end of January 2020, we found on BioRxiv, an Indian pre-study on “strangely similar insertions” between SARS-CoV-2 and HIV. This study was taken up worldwide by the complosphere in order to promote the thesis of a virus created in the laboratory. We find it in particular, in conspiracy theories on Twitter, during our period of analysis. It has since been dismissed by specialists and its own authors, but continues to be cited as a reference by supporters of the thesis of a laboratory virus.

In our study, we can also cite the circulation of numerous fake news. For example, we can report the often relayed fake news of a virus manufactured in a laboratory. Indeed, on Twitter, since the beginning of March 2020, a patent dating from 2004 relating to a vaccine against SARS-Cov-1 has been circulating in cyberspace and has been the subject of multiple misinterpretations.

This patent actually concerns a vaccine candidate against another type of coronavirus which has nothing to do with SARS-Cov-2. Not only are these gross errors of interpretation voluntarily or involuntarily relayed on the social network. But tweeters also do not hesitate to publicly attack the Pasteur Institute as having invented the virus at the origin of the pandemic.

As other fake news, we also found from February 2020, information claiming that a Cameroonian student in China was cured of the virus because of his African genes, while no evidence exists that Africans are more resistant to the virus.

We can also cite several viral tweets which claim that snorting cocaine could sterilize the nostrils of the coronavirus.

CONCLUSIONS AND DISCUSSIONS

The explanatory descriptive analysis of the publications that we conducted on Twitter concerning Covid-19, using the Radarly® tool, during the period from 03/01/2020 to 06/29/2020 highlighted the resurgence of conspiracy theories, particularly with references to scientific studies.

We can note that reference to scientific studies is a classic rhetoric of conspiracy theories (Peltier, 2018). Indeed, they serve both to discredit speeches that are hostile to conspiracy theories and to criticize speeches from authority. The objective is to induce in the reader a real paradigmatic doubt through the very large number of references, often contradictory. According to Giry, this strategy already appeared in the 1960s, after the assassination of John Fitzgerald Kennedy, where conspiracy theories referred to quotes, academic works or footnotes in order to attribute the attack to the president to a conspiracy (Giry, 2017). Our analysis also corroborates other studies. For example, Kouzy's study that highlighted that 24.8% of the tweets collected during the pandemic were disinformation and 17.4% contained unverifiable information (Kouzy et al., 2020). We can also note that our work corroborates the results published by the IFOP polling institute, in its annual study on conspiracy for the Jean-Jaurès Foundation and the Conspiracy Watch (IFOP, 2020). In this survey carried out on a sample of 1,008 people representative of the French population aged 18 and over, from March 24 to 26, 2020, a majority of French people questioned (57%) believe that the coronavirus appeared naturally, but more than one in four respondents (26%) think it was made intentionally (17%) or accidentally (9%) in a laboratory.

In conclusion, our work highlights that medical misinformation about the epidemic was spread at an alarming rate on Twitter and was having health, social and societal impacts.

In discussion, it seems to us that with the advent of Web 2.0 and Twitter, the border which separates the public space that of the Internet, and our private space, our intimate life, has become increasingly blurred. Our data, our testimonies, our tweets are preserved, relayed, disseminated, transformed. Thus, during the Covid-19 epidemic, with the advent of this social web, conspiracy theories and fake news found a unique “breeding ground” for propagation. The boundaries of digital have become more and more subtle because manipulations have become more and more effective and have become invisible across these boundaries and in this cyberspace, where our privacy no longer belongs to us. In our opinion, it is a true social paradigm, beyond being a technological revolution. It would be interesting to deep our results by carrying out quantitative analyses, both around conspiracy theories and fake news that circulated during our study period, but also controversies. It would also be interesting to determine the geolocation of the dissemination of these messages. It also seems interesting to continue our work by analyzing the social impacts of this conspiracy theories and fake news.

REFERENCES

Allard-Huver, F. (2019). *Fake news, post-vérité & infox*. <http://allardhuver.fr/publications/fake-news/>

Berelson, B. (1952). Content analysis in communication research. Glencoe: The Free Press.

Butter, M., & Reinkowski, M. (2014). Introduction: Mapping conspiracy theories in the United States and the Middle East. In M. Butter, & M. Reinkowski (Ed.). *Conspiracy theories in the United States and the Middle East: A comparative approach* (pp. 1-21). Berlin, Boston: De Gruyter. <https://doi.org/10.1515/9783110338270.1>

Clauzard, P. (2014). *Cours de méthodologie de recherche: Théorie et application*. Université de Réunion, ESPE. <http://www.formations.philippeclauzard.com/methodo-rechercheUE18.pdf>

Fenster, M. (1999). *Conspiracy theories: Secrecy and power in american culture*. Minneapolis: University of Minnesota Press.

Freiman, O. (2019). The philosophy of taking conspiracy theories seriously. *Social Epistemology Review and Reply Collective*, 8(9), 51-61.

Freud, S. (2012). *L'interprétation du rêve*. (Collection Quadrige). Puf. https://www.puf.com/content/Linterpr%C3%A9tation_du_r%C3%A8ve_PAREI_AQUI_JANA

Gallagher, F., & Marceau, M. (2020). La recherche descriptive interprétative: Exploration du concept de la validité en tant qu'impératif social dans le contexte de l'évaluation des apprentissages en pédagogie des sciences de la santé. In M. Corbière, & N. Larivière (Eds.), *Méthodes qualitatives, quantitatives et mixtes*, 2e édition: *Dans la recherche en sciences humaines, sociales et de la santé* (pp. 5-32). Québec: Presses de l'Université du Québec. <https://doi.org/10.2307/j.ctv1c29qz7.6>

Giry, J. (2017). Étudier les théories du complot en sciences sociales: Enjeux et usages. *Quaderni*, 94(3), 5–11. <https://doi.org/10.4000/quaderni.1101>

IFOP Group. (2020). *Un français sur quatre estime (à tort) que le coronavirus a été conçu en laboratoire: Conspiracy Watch: L'Observatoire du conspirationnisme*. <https://www.conspiracywatch.info/un-francais-sur-quatre-estime-a-tort-que-le-coronavirus-a-ete-concu-en-laboratoire.html>

Kouzy, R., Joseph, A. J., Kraitem, A., El Alam, M. B., Karam, B., Adib, E., Zarka, J., Traboulsi, C., Akl, E. W., & Baddour, K. (2020). Coronavirus goes viral: Quantifying the COVID-19 misinformation epidemic on Twitter. *Cureus*, 12(3), e7255. <https://doi.org/10.7759/cureus.7255>

Maingueneau, D. (2009). *Les termes clés de l'analyse du discours*. <https://shs.hal.science/halshs-01150060>

Mesquita, C. T., Oliveria, A., Seixas, F. L., & Paes, A. (2020). Infodemia, fake news and medicine: Science and the quest for truth. *International Journal of Cardiovascular Sciences*, 33(3). <https://www.scielo.br/j/ijcs/a/gFzP6nLZXytdHLJCcLMXWGz/?lang=en>

Ministère de l'Éducation Nationale et de la Jeunesse. (2018). *Recommandation sur les équivalents français à donner à l'expression Fake News*. <https://philarchive.org/rec/FRETPO-52>

Moatti, A. (2013). *Alterscience: Postures, dogmes, idéologies*. Éditions Odile Jacob. <https://www.decitre.fr/livres/alterscience-9782738128874>

Mucchielli, R. (1979). *Opinions et changement d'opinion, connaissance du problème, applications pratiques*. Éditions E.S.F. <https://www.leslibraires.fr/livre/1696412-opinions-et-changement-d-opinion-connaissance--roger-mucchielli-editions-e-s-f--entreprise-moderne-d-edition>

Mucchielli, R. (2006). *L'analyse de contenu: Des documents et des communications* (9e éd.). Éditions E.S.F.

Negura, L. (2006). L'analyse de contenu dans l'étude des représentations sociales: Analyzing content in the Study of Social Representations. *SociologieS*. <https://doi.org/10.4000/sociologies.993>

Peltier, M. (2018). *Dans les coulisses du récit complotiste*. Éditions Inculte. <https://inculte.fr/produit/obsession/>

Wardle, C. (2017). *Fake News: La complexité de la désinformation*. <https://firstdraftnews.org/articles/fake-news-la-complexite-de-la-desinformation-2/>

Wasim, A., Vidal-Alaball, J., Downing, J., & Lopez Segui, F. (2020). COVID-19 and the 5G conspiracy theory: Social network analysis of Twitter data. *Journal of Medical Internet Research*, 22(5), e19458.

Internet Censorship in Russia

*Marija Bitunjac*¹

*Martina Dragija Ivanović*²

ABSTRACT: The topic of this paper is Internet censorship in Russia with the aim of determining censorship on websites, or the success of connecting to them in general, using and analyzing data from online censorship measurement portals (OONI and Censored Planet). The first half of this paper will start by defining censorship and Internet censorship, but the focus of the paper was on top-down censorship, government-level censorship that infringes upon one of the fundamental human rights: the right to freedom of expression, access, and the dissemination of information and ideas. The importance of human rights is also highlighted by IFLA through the Glasgow Declaration and Internet Manifesto. Other than libraries, there are many organizations that have stood up against Internet censorship. This paper presents the work of three organizations, which are Access Now, Freedom House, and RSF. In addition, there are also various technical methods to bypass Internet censorship (VPN and Proxies) which enable users to access censored content. However, the Russian government, as far back as 2019, began implementing laws to install equipment for identifying these tools and overall content filtering. They continued to act in the same manner in the following years, especially in 2022 when they launched an attack on Ukraine. They continued the same steps in 2023 and because of that, using the data from OONI and Censored Planet platforms, in this paper the data about measurements for Russia in the period from January 1st to June 30th, 2023, was analyzed. The test which was used was web connectivity test in case of OONI and DNS, HTTPS and HTTP test in case of Censored Planet with the purpose of determining the success rate of linking to websites in Russia for that period, especially looking at websites which belong to specific categories that are tools for anonymization and circumvention, communication tools, human rights issues, social networking and news media.

KEYWORDS: Internet censorship; human rights; website blocking; circumventing Internet censorship; censorship in Russia

¹ University of Zadar, Zadar, Croatia.
E-mail: mbitunjac13@gmail.com

² University of Zadar, Zadar, Croatia.
E-mail: mdragija@unizd.hr | ORCID iD <https://orcid.org/0000-0002-6541-7195>

INTRODUCTION

Censorship is a term that appears as early as 433 BC, and comes from the Latin word censor. This is the name for an activity that included inventorying property and evaluating the morals of citizens. Since censorship is a moral judgment of published content by a governing body, in the Croatian encyclopedia censorship is defined as the control and prohibition of the flow of information, cultural and artistic content in any format based on the judgment of the welfare of the community and society. The term governing body means the state, religious, corporate, political party and other bodies. (Croatian encyclopedia, 2021). Furthermore, Stipčević speaks of censorship as “a system of measures taken by the authorities or those who represent that authority, to prevent the public expression of ideas and opinions that the authorities consider to be contrary to their interests, i.e. those moral and social norms that apply in a certain environment and time [...]” (Stipčević, 1992). Depending on the time of its implementation, there is preventive censorship that is carried out before publication or performance of the content, and censorship that occurs before publication or performance is also self-censorship that the author carries out on himself, and there is suspensive censorship, which is censorship after publication or performance (Croatian encyclopedia, 2021).

Panić, on the other hand, divides censorship according to the subject, which is the body that carries it out. According to that, there is top-down censorship, which is carried out by institutionalized social bodies such as the state, state bodies, and civil servants, and bottom-up censorship, which refers to individuals, groups, associations, or interested parties that can be censors due to their position in society (Panić, 2018). The emergence, development, and greater use of technology in various aspects of human life have led to the emergence of a new form of censorship, the Internet censorship. Phenomenon that extends through several scientific fields, including social sciences, and has an impact on the overall structure of the Internet, protocols, and people's behavior (Aceto & Pescapé, 2015); therefore, it can be defined as the control and prohibition of access, publication, or viewing certain content on the web. As Panić explained, depending on the censor, we distinguish between censorship from

above, the control and banning of content at the request of the state or organization, and censorship from below, censorship by non-institutional individuals or groups of people. Vojinović also writes about censorship from above and defines it as exerting pressure on Internet service providers by the government by making demands on which content will be published and which will be blocked. In other words, Internet service providers implement Internet censorship by blocking certain content on a page or pages in their entirety, filtering, and controlling the flow of information at the request of the government (Vojinović, 2023).

The focus of this paper will be censorship from above, censorship at the government level, whose implementation violates one of the fundamental human rights, the right to freedom of expression, access, and dissemination of information and ideas, which is clearly defined in the “Convention for the Protection of Human Rights and Fundamental Freedoms.” The rights clearly defined by the convention, serving as the primary argument, laid the foundation for the suppression and fight against censorship, and in response to the implementation of censorship, numerous communication systems were developed and various organizations started their work. Libraries, which in the past were often used to enforce censorship and shape the opinions of society, especially during totalitarian regimes, also found their role in this fight (Stipčević, 1992).

Authors surveyed literature (both in English and Croatian) dealing with this topic in available print and online sources. We used the following keywords to search the database and Internet: censorship, intellectual freedom. We aimed to identify all relevant literature which could add to our understanding of previous contributions and scholarly work on this topic.

In the research part of the work, the results of the research on Internet censorship in Russia are presented, where, on a daily basis, content is controlled and blocked by the state authorities, especially after the attack on Ukraine in 2022. Just one month after the attack, the Russian government announced a series of laws related to the prohibition of disseminating,

according to them, unreliable information about the Russian armed forces and other state bodies (Li & Whitworth, 2023).

The research was conducted using measurement data from OONI and Censored Planet. An analysis of the degree of censorship carried out on the websites of organizations that advocate freedom of expression and fight against internet censorship was carried out.

INTERNET CENSORSHIP

The use of the Internet expanded significantly in the 1990s of the last century all over the world and brought significant changes in the way of production, dissemination, and use of information. The Internet is recognized as an effective tool for promoting freedom of expression and the free transfer of information, not only by civil society but also by other parties such as scientists and fighters for fundamental human freedoms. However, the authorities recognized the danger that the Internet can bring when shaping society and attitudes and values, so a new form of censorship soon developed: Internet censorship. Fletcher is talking about exactly how, in order to implement this type of censorship, the authorities had to develop different tools to stop the production and flow of information and its dissemination among the population because, unlike traditional censorship, it was no longer enough to simply arrest and attack members of the media. Therefore, internet censorship can be defined as a method of preventing the free flow of information and the use of services in the web environment (Fletcher, 2023).

As the Internet is still considered a relatively new medium, there are no clearly defined rights regarding restrictions in the virtual environment, so the authorities can more easily circumvent those rights specified in the “Convention for the Protection of Human Rights and Fundamental Freedoms.” The Convention states that every individual, regardless of age, gender, race, or religion, has the freedom to express his own opinion and receive and spread information and ideas without interference from the public authorities (National newspapers, 1999). Nevertheless, some form of Internet censorship is implemented in almost all countries of the

world, and this is evidenced by the latest report on democracy published by the V-Dem Institute, which shows that in the last ten years, freedom of expression has worsened in 35 countries, censorship by state authorities in 47 countries, and state repression against civil society organizations in 37 countries (V-Dem Institute, 2023). It is important to highlight Burnett's reflections on the government's relationship to freedom of access to information. He says that the authorities should strive to ensure that "although it is not always possible to guarantee free and open access to information, citizens have the right to know when their access is obstructed, limited, or changed, so that they can make timely decisions about access to information." (Burnett & Feamster, 2013).

AWARENESS, FIGHT AGAINST INTERNET CENSORSHIP AND WAYS OF CIRCUMVENTION

Libraries are public institutions recognized as a place where the "educational, cultural, and informational needs of all citizens" are nurtured (National Newspapers, 2000) and are thus directly related to the fight for freedom of expression and access to information. Horvat believes that in order for a person to speak freely, he must be knowledgeable about the topic he is talking about, and for that, he needs information. A large number of them are located in institutions specially organized by society with the task of collecting, processing, and making information available, namely public libraries" (Horvat, 2021). Within the framework of the umbrella library association IFLA, there is an Advisory Committee for Freedom of Access to Information and Freedom of Expression (FAIFE), which describes its mission as "at the heart of IFLA's efforts to promote intellectual freedom and achieve its vital mission of supporting libraries in their roles as gateways to knowledge and ideas." (IFLA, n.d.). One of the prominent documents by which IFLA defines the role of the library is the "Glasgow Declaration on Libraries, Information Services, and Intellectual Freedom," by which IFLA declares the right of access and the right to express fundamental human rights and asserts that the library's basic task is commitment to intellectual freedom and the preservation of democratic values and civil rights, regardless of restrictions, opposing all

forms of censorship (IFLA/FAIFE, 2002). It is also important to mention IFLA's Manifesto on the Internet, which talks about freedom of access to information, expression of one's own opinions, and the role of the library in publishing these freedoms in the virtual world. In addition to libraries, various organizations and associations recognized the importance of freedom of expression and other human rights, and the online environment provided them with space for global awareness of the importance of these freedoms, the daily promotion of freedom of speech, and the fight against all types of censorship, especially that of the Internet. In this way, the original idea of the Internet as an environment for the global and free production and dissemination of information is maintained.

Such organization is Access Now, a non-profit organization founded in 2009 that deals with human rights issues in the digital environment through a series of activities. In 2011, the organization held the first meeting of RightCon, which is the leading summit on human rights in the digital age. Its goal is to create an environment in which all layers of civil society will participate in building a digital environment that respects and advocates for human rights. The organization operates through innovative campaigns and digital engagements and provides education and assistance through its digital safety helpline (Access Now, 2023). One of her prominent campaigns is #KeeoItOn: Fighting Internet Shutdowns Around the World. This campaign was a collaboration between Access Now and the KeepItOn coalition, and 187 intentional internet disruptions, or "internet shutdowns," were counted in 35 countries. Among these countries was Russia, which cut off Internet access at least 22 times during the attack on Ukraine (Rosson et al., 2023). Another example would be, the Freedom House, organization founded in 1941, and since then it has dedicated its activities to the support and defense of democracy with a vision of a free world, which it achieves by reporting on threats to freedom by publishing detailed research in over 200 countries and territories, supporting advocates of democracy and fighters for human rights even in the most politically restrictive, in part by building relationships with researchers and local activists who promote the free flow of information and ideas (Freedom House, n.d.). Every year, Freedom House, in cooperation

with the aforementioned researchers, conducts research and analysis of Internet freedom under the title “Freedom on the Internet.” More than 70 researchers from various organizations, academic communities, and journalism covering an area of 65 countries were included in the research itself, and they have an elaborate methodology of 21 questions related to privacy, freedom of expression, and access to the Internet that relate to their area and the country from which they are coming (Shahbaz et al. 2020). According to the comprehensive results of the survey “Freedom on the Internet” from 2023, Russia was declared “unfree”. As one more organization with the goal of overcoming censorship and will to fight for human rights, there is Reporters Without Borders (hereinafter referred to as RSF). The organization was founded in Montpellier in 1985 by four journalists to oppose censorship, promote and advocate freedom of expression and the flow of information. In 1995, it received the status of an international non-profit and non-governmental organization guided by democratic principles. Accordingly, they respect the barriers and fight for the human rights of free and free access to information, as it is a right that leads to understanding, the formation of opinions, the acquisition of knowledge and the creation of a functional and just society. The mission of the organization is advocacy for freedom, pluralism and independence of journalism, and is based on respect, non-discrimination, joint work and communication. RSF reports daily on the state of media freedom and all forms of censorship, supports many actions to unblock censored websites, freedom of thought and expression worldwide (RSF, 2016). The organization’s official website allows monitoring of the countries most affected by censorship and reports daily to the world about cases of censorship around the world. The very name of the organization, “Reporters without Borders,” speaks of the way they operate and truly remain consistent, reporting without borders in new, interesting, and alternative ways. Thus, in 2018, music streaming platforms were recognized as a way of restoring the truth in countries affected by Internet censorship. Music streaming platforms, such as Spotify, Apple Music, and Deezer, are free and available in almost every part of the world, even in countries with the most internet censorship. The organization enabled five journalists to become copywriters. Articles that were censored were turned into songs

in English and their mother tongue, performed by local and international musicians. In this way, their word became known around the world but also returned to their countries through a playlist of songs called “The Uncensored Playlist.” This started a global discussion about censorship but also achieved much greater visibility of these articles both in the world and in the area of their creation (MediaMonks, 2020). In 2020, the computer game Minecraft was recognized as another way to circumvent censorship by launching “The Uncensored Library,” a library within the game. On March 12, when “World Day Against Cyber Security” was held, this library started its activities within the game “Minecraft.” The creators of this map, that is, the world within the game, gave a safe place to numerous authors from different countries, including Iran, Russia, Saudi Arabia, and other countries (Reporters Without Borders, 2020). All content collected inside the library is completely free and available within a game. The library consists of the main dome, where the countries are ranked according to the degree of censorship, but there are also special departments for individual countries, such as the Department of Russia, where articles on which Internet censorship was carried out by the Russian government are available for free access. The authors whose articles are on the “shelves” of this library are Yuri Izotov, who writes about the Russian government’s pressure on the Internet; Alexander Skobov and Vitaly Portnikov, who criticize politicians; and Ilya Milshtein and Alexander Podrabinek. This library is not limited by physical space, and in that way, it becomes an excellent tool for avoiding Internet censorship.

Other than music platforms and computer games there are other technical ways of circumventing Internet censorship. It has already been mentioned that the Internet was originally conceived as a communication system for the dissemination and exchange of information between people without any restrictions anywhere in the world (Leiner et al. 2003). The governing bodies recognized such a globally connected virtual world as a threat to their political, religious, or similar beliefs, which resulted in numerous cases of Internet censorship. Winter describes the problem of Internet censorship as the intention of a client, or a person, to access and retrieve certain information that is blocked and located outside the

censored network. The censor, whether it is a state, an organization, or a third party, controls part of the network path between the client and the information or content they want to access. Thus, the censor selectively blocks the traffic of network content, or, in other words, prevents the free flow of information (Winter, 2014). However, thanks to great computer literacy, various tools have been developed today that can be used to avoid censorship, with the use of which individuals can still access content that has been censored. The most commonly used tools are virtual private networks (VPNs) and various proxies.

CENSORSHIP OF THE INTERNET IN RUSSIA

By installing anti-threat equipment and the Sovereign Internet Act, the Federal Service for the Supervision of Communications, Information Technology, and Mass Media already in 2019 provided the Russian government with greater opportunities to restrict access and block websites in Russia. By law, operators are required to install additional equipment and tools for filtering and controlling their subscribers' internet, and the same tools are used to censor and limit access to websites. Internet censorship took off in March 2022, just one month after Russia's attack on Ukraine. When the Russian government announced a series of new laws aimed at banning and disseminating what it considers inappropriate and unreliable information about the Russian armed forces and other government bodies and expressed it as "invasion," they considered it an opposition to the national interest and could result in a prison sentence of up to 15 years (Li & Whitworth, 2023). Such criminal provisions are used to suppress critical discussions on the Internet (Freedom House, n.d.); however, this did not prevent certain media companies from publishing "unreliable" content, but they were blocked or temporarily banned for that reason. They do not remove the same content, which is clearly seen from the research conducted jointly by Roskomsvoboda (a Russian non-governmental organization that fights for a free Internet and the application of human rights in the digital environment) and the OONI initiative. The results of the research showed that in the same year, the Russian authorities blocked access to social networks, Russian and foreign media, websites that provide access to tools

for bypassing censorship (such as VPNs), and numerous others that deal with human rights issues and reporting on Russian operations, especially in Ukraine (Roskomsvoboda & OONI, 2023). Active blocking will continue in 2023. The journalistic blogging platform Medium was blocked due to the unsuccessful removal of content about Russian operations in Ukraine, and the “WE” website suffered a similar fate, which, if it does not remove “inappropriate” content, will be permanently banned and added to the list of banned websites (Roskomsvoboda, 2023). These are just some of the examples of numerous blocked websites, i.e., those that have experienced Internet censorship, and the previously mentioned OONI and Censored Planet are platforms that enable the measurement of blocked websites, so they will be presented in the following text as they were used to implement the research part of this work, determining the percentage of Internet censorship by checking connectivity which includes measurements of successful and failed cases of connecting to various websites.

OONI AND CENSORED PLANET

OONI stands for “Open Observatory of Network Interference,” which is a global initiative that aims to directly measure internet censorship around the world. It was created in 2012 as part of the “Tor Project,” but today it operates independently with the mission of promoting an open and free Internet and raising awareness about Internet censorship. Internet censorship measurements are carried out through free software, the OONI Probe application, which allows the measurement of the blocking of websites, messaging applications, and Internet censorship bypass tools. Measurements, or data obtained from these measurements, are simultaneously published on OONI Explorer and the API. Together, in cooperation with various partners, such as “Access Now,” they make Internet censorship visible. Publicly and freely available relevant data enable human rights fighters, activists, and journalists to conduct research on documented cases of censorship in any country (OONI, n.d.). In 2022, OONI participated in numerous events and projects related to Internet censorship and the promotion of human rights to expression, and numerous research projects were created using precisely the data that was

collected and published using OONI tools. They continuously work on improving their tools, cooperate with numerous organizations, and report daily on cases of censorship on all their platforms. This is precisely why it was chosen as a data source for blocked websites in Russia. The difference between the OONI platform and Censored Planet is that OONI depends on participants within countries to help them collect measurements, while Censored Planet does not depend on volunteers and uses IT infrastructure to collect measurements. Censored Planet was founded in 2018 and is a platform for measuring censorship and collecting measurements in more than 200 countries. The data on this platform played a key role in identifying and monitoring important Internet censorship events, i.e., the blocking of websites and access to website content. In 2019, it was also used in a study of internet censorship in Kazakhstan, and its data was also used to study Russia's decentralization mechanism for censorship as well as the suppression attack they carried out on Twitter (Censored Planet, n.d.).

RESEARCH: THE DEGREE OF SUCCESSFUL LINKING TO WEB CONTENT ON RUSSIAN SITES

The purpose of this research is to show the success of linking to the contents of websites in the territory of Russia in the period from July 1 to December 31, 2023. The goal is to determine the degree of Internet censorship in the period from July 1 to December 31, 2023, by analyzing the data collected and generated using the tools of the OONI and Censored Planet platforms. In order to authentically compare the results from these two platforms for measuring Internet censorship, the research was limited to six categories of websites: anonymization and circumvention tools, communication tools, hosting and blogging platforms, human rights issues, media news, and social networking. All six categories belong to the area of the exchange of ideas and opinions, so it is important to determine the success of their activities.

Research questions:

1. What percentage of Internet censorship was carried out over websites that fall into the categories of anonymization and

circumvention tools, communication tools, hosting and blogging platforms, human rights issues, media news, and social networking? What kind of results does the OONI MAT tool show, and what kind of results does the Censored Planet Dashboard show?

2. What is the percentage of Internet censorship over the percentage of successful connections?
3. Are there any deviations in measurements comparing OONI and Censored Planet data on censored websites with regard to all selected categories of websites and selected categories of websites?

Description of the research:

To perform the analysis of the first set of data, OONI Explorer and MAT, Measurement Aggregation Toolkit, were used. MAT allows data aggregation and graph creation by selecting different elements such as country, ASN (i.e., servers), time range, data display (by month, week, or day), columns (day of measurement, page category), and rows (domain, ASN, website category), test, domain, and category to which the website belongs (human rights, government, terrorism, etc.).

For the analysis of the second set of data, the Censored Planet Dashboard was used, which also aggregates data according to independently selected elements (country, network, subnet, website category, domain, and time range). Namely, with this tool, the data is displayed on two graphs: the timeline of the outcome and the outcome according to the network servers, and for the purposes of this work, the data of the “timeline of the outcome” graph will be analyzed.

The first part of the research was the analysis of data from six categories in the period from July 1 to December 30, the second half of the year 2023. In order to get an overview of the data on the OONI platform, the following elements were used:

- Country: Russia

- Time range: 1-7-2023 to 31-12-2023
- View data by: month
- Test name: web connectivity test
- Website category (anonymization and circumvention tools, communication tools, hosting and blogging platforms, human rights issues, news media and social networking)

In order to get an overview of the data on the Censored Planet platform, the following elements were used:

- Country: Russia
- Time range: 1-7-2023 to 31-12-2023
- Test: DNS Analysis, HTTPS Analysis, and HTTP Analysis
- Website category: (anonymization and circumvention tools, communication tools, hosting and blogging platforms, human rights issues, news media and social networking)

The OONI web connectivity test was used, which as a result gives the total number of measurements and data on confirmed censorship, anomalies (possible censorship or not confirmed), and successful connections to content on the website. For Censored Planet, all three tests (DNS analysis, HTTPS analysis, and HTTP analysis) were used and also returned data on the success or failure of connecting to the websites or content of the website.

FINDINGS

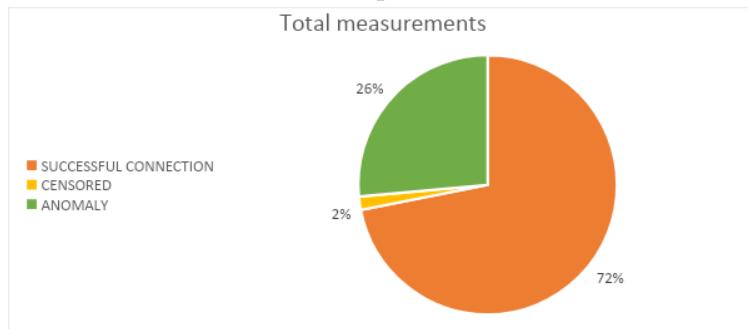
The first set of data from the OONI platform, using the web connectivity test for the period from July 1 to December 31, 2024, has a total of 10.672.302 measurements. Of all total measurements, 174.602 were cases of confirmed internet censorship, according to the data obtained using the MAT data aggregation tool, which accounts for 2% of the total

measurements. Furthermore, 2823611 of them indicated the occurrence of an anomaly, so 26% of the total measurements show that it was probably a question of blocking access to websites or content on websites, or some other form of censorship, such as messing with DNS or something similar. Measurements that showed a successful connection to web pages make up 72% of the total measurements. The data is visible in table 1 and on the graphic display 2.

1 Table showing data by month and total measurements for the period from July 1 to December 31, 2023 (OONI platform)

	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	Total measurements per category
SUCCESSFUL CONNECTION	1065355	1543132	1536737	1509379	1043447	976039	7674089
CENSORED	27904	36941	32935	29148	22848	24826	174602
ANOMALY	426273	546793	513850	519459	452728	364508	2823611
Total measurements per month	1519532	2126866	2083522	2057986	1519023	1365373	
Total measurements in general							10672302

2 Total measurements for the period from July 1 to December 31, 2023 (OONI platform)



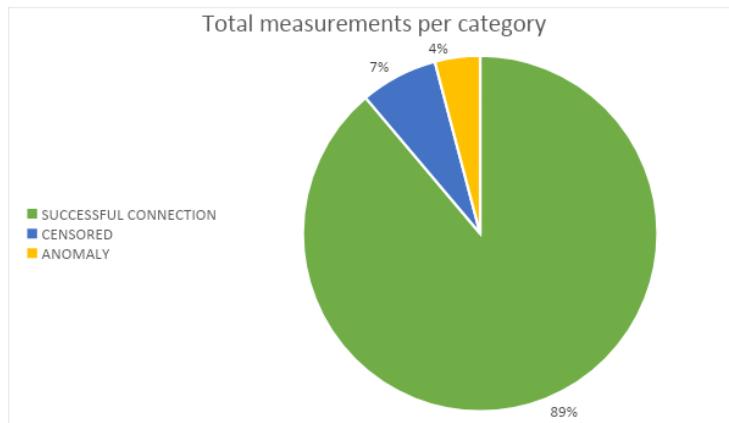
Data from the Censored Planet platform, with the total sum of all three tests (DNS analysis, HTTPS analysis, and HTTP analysis) for the period from July 1 to December 31, 2024, has a total of 1,934,427 total measurements. Of all these total measurements, the question of confirmed censorship was in 136,513 cases, and they make up a total of 7% of the total measurements. If we add the total number of anomalies, that is, possible cases of censorship, that percentage rises to 11%, as anomalies make up 4% of all total measurements. The number of measurements

that showed a successful connection to web pages and the contents of web pages makes up 89% of the measurements. The data is visible in table 3 and in the graphic display 4 below.

3 Table showing data by month and total measurements for the period from July 1 to December 31 (Censored Planet platform)

	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	Total measurements per category
SUCCESSFUL CONNECTION	179429	216387	309214	407481	303360	302321	1718192
CENSORED	6646	8098	30275	35704	27334	28456	136513
ANOMALY	9009	10461	10821	15539	17909	15983	79722
Total measurements per month	195084	234946	350310	458724	348603	346760	
Total measurements in general							1934427

4 Total measurements for the period from July 1 to December 31, 2023 (Censored Planet platform)



Looking at both platforms, it is evident that OONI counts a higher number of internet censorship measurements than Censored Planet in the selected range of months. OONI measurements are 10672302, which is visible in the table, while Censored Planet has almost 451% fewer measurements. Although Censored Planet has a smaller number of measurements of Internet censorship, the difference in measurements that have shown that it is a question of confirmed cases of Internet censorship does not deviate on a large scale. The difference in censorship measurements

is only 28%, with Censored Planet in 136,513 (see table) cases of Internet censorship and OONI in 174,602 cases (see table).

DISCUSSION

Analyzing the data on both platforms found that Internet censorship is ubiquitous; with OONI, it was the case in 2% of the total measurements, and with Censored Planet, it was the case in 7% of the cases with regard to the overall measurements. Anomalies, i.e., measurements that show data on possible cases of censorship, appeared on both platforms; with OONI, they make up 26% of the total measurements, and with Censored Planet, 4%, which greatly increases the number of censorships carried out if we consider that at least part of them was Internet censorship after all. It is therefore visible that the human rights to express, share, and spread ideas in the territory of Russia are largely violated, and thus the original idea of the Internet as a free and safe environment for expressing opinions and introducing changes is being lost. The selected categories of pages belong to those categories that provide access to information about the real time situation and space for expression and exchange of ideas. The social networking category of websites is exactly the one where people communicate every day and, at the same time, exchange information, either about their private lives or about current social topics and events. Hosting and blogging platforms, as well as communication tools, also have the same purpose, which is usually not only related to private communication but also official and business communication. By disrupting this communication, the opportunity to exchange and spread new and current ideas, values, and topics is denied, which again denies human rights. In the theoretical part of the text, tools for anonymization and circumvention are also mentioned as tools developed for the purpose of bypassing Internet censorship; however, we can see that the Russian government still found ways to stop their use and deny its citizens external and internal perspectives. News media categories of websites, those that report on the daily state of society and are available and adapted to all age groups, especially looking at older generations who may not be involved and familiar with other websites categories, such as Social Networking,

are largely affected by Internet censorship. The results of the analysis are consistent with the theoretical basis of this work. Internet censorship in Russia has increased since 2019, as we can see from the Freedom House report of 2021. If we look at the research conducted in cooperation with Raskomsvoboda and OONI in 2023, we also see the constant attempts by the Russian authorities to block access to Russian and foreign media websites, as well as various tools to circumvent censorship, as well as numerous websites dealing with human rights issues and the war with Ukraine. Roskomsvoboda reported later in 2023 on the same efforts of Russian authorities to block websites. When the results of this analysis are combined with these findings, it becomes clear that the government in Russia in 2023, just as in previous years, is persistently trying to shape people's attitudes and minimize access to content that it deems inappropriate and harmful to achieving its goals.

CONCLUSION

Censorship has a long history, but it is always carried out for the same reasons and by the same censors. Those who censor are actually those who have the most power; today, it is mostly the government, and the reason for censorship is an attempt to shape opinions and deny certain information and content that could threaten their views and ideas. As the new digital age, i.e., the Internet, has brought new possibilities for expressing and spreading opinions, a new form of censorship has also appeared, namely internet censorship. The government has developed new tools with which it censors content, violates human rights of expression, and destroys the original idea of the Internet as a free environment for the creation and exchange of ideas and attitudes. Constant attempts by the authorities to deny access to information and ideas did not stop individual participants in the fight against such actions. For the purpose of resistance, there are numerous organizations today that promote freedom of speech, fight for human rights, and fight against Internet censorship. They report on censorship in new and innovative ways and find ways around it. Thus, we have the organization Access Now, which carries out various campaigns and other activities in order to advocate for free access, then

Freedom House, which every year conducts research to report on Internet censorship in the world, and the RSF organization, which, in addition to actively reporting on censorship, also finds new and interesting ways of circumventing it. The way they used platforms for listening to music and the computer game Minecraft as a communication channel through which they returned censored content to the countries where they originated is particularly intriguing, as it is easy to reach the youth in society, not only those from scientific fields. Computer literacy also enabled the development of various technical ways to bypass internet censorship, such as VPNs and proxy servers, which enable their users to access censored content and be informed of the real situation. Already in 2019, the Russian government actively began to fight against such organizations and ways of bypassing by installing tools for detecting and verifying content in order to disable access to websites that publish inappropriate content for them, but also to those that provide access to tools to bypass censorship. In addition, it has issued a series of laws that try to prevent the spread of information about its activities and rigorously punishes violations of these laws, and the implementation of Internet censorship itself has significantly worsened since the attack on Ukraine in 2022 and will continue at the same pace in 2023, especially when it comes to blocking online pages of journalistic houses, those that provide tools to bypass censorship, talk about human rights, criticize political actions, and those that serve as a channel of communication. Accordingly, the researchers part of the work related to the analysis of data on Internet censorship measurements in Russia in the period from July 1 to December 31, 2023, using the OONI and Censored Planet platforms that provide data on Internet censorship. The success of connecting to web pages was investigated using a tool for displaying internet censorship measurements. Data analysis revealed that Internet censorship in Russia continues, and in the period from July 1 to December 31, 2023, 174,602 cases of censorship were measured on OONI, which is 2% of the total measurements, and 136,513 cases on Censored Planet, which is 7% of the total. measurements. Although OONI had more total measurements than Censored Planet, the difference in those measurements that showed censoring is not significantly large, accounting for 28% of the measurements on OONI, which, when we

take its total number of measurements, is not significantly higher than those measurements obtained using Censored Planet. Regardless of the differences in measurements in both cases, internet censorship has been proven to deny basic human rights and this research has its importance as a basis for further research in the field of internet censorship using these platforms, Censored Planet and OONI, which provide numerous other tools for deeper analysis of internet censorship in different countries.

REFERENCES

Access Now. (2023). *About Us*. <https://www.accessnow.org/about-us/>

Aceto, G., & Pescapé, A. (2015). Internet Censorship detection: A survey. *Computer Networks*, 80, 381-421. <https://doi.org/10.1016/j.comnet.2015.03.008>

Burnett, S., & Feamster, N. (2013). Making sense of internet censorship: a new frontier for internet measurement. *Computer Communication Review*, 43(3), 84-89. <https://doi.org/10.1145/2500098.2500111>

Censored Planet. (n.d.). *Welcome to Censored Planet Observatory's documentation!*. <https://docs.censoredplanet.org/index.html>

Croatian Encyclopedia. (2021). *Censorship*. Leksikografski zavod Miroslav Krleža. <https://enciklopedija.hr/natuknica.aspx?id=11246>

Fletcher, T., & Hayes-Birchler, A. (2023). Is remote measurement a better assessment of internet censorship than expert analysis? Analyzing tradeoffs for international donors and advocacy organizations of current data and methodologies. *Data & Policy*, 5, e9. <https://doi.org/10.1017/dap.2023.5>

Freedom House. (2021). *Russia: Freedom on the Net 2021 Country Report*. Freedom House. <https://freedomhouse.org/country/russia/freedom-net/2021>

Freedom House. (n.d.). *About Us*. <https://freedomhouse.org/about-us>

Horvat, A. (2021). The Croatian Library Association and freedom of access to information twenty years later. In S. Perić, & A. Štimac (Ed.), *Free access to information: 20th round table on free access to information December 10, 2020* (pp. 41-49). Croatian Library Association.

International Federation of Library Associations and Institutions. (n.d.). *Advisory Committee on Freedom of Access to Information and Freedom of Expression*. <https://www.ifla.org/units/faife/>

International Federation of Library Associations and Institutions/Freedom of Access to Information and Freedom of Expression. (2002). *The Glasgow Declaration on Libraries, Information Services and Intellectual Freedom*. <https://repository.ifla.org/handle/20.500.14598/3473>

Leiner, M. B., Cerf, V. G., Clark, D. D., Kahn, R. E., Kleinrock, L., Lynch, D. C., Postel, J., Roberts, L. G., & Wolff, S. (2003). A Brief History of the Internet. *Computer Communication Review*, 39(5), 22-31. <http://doi.acm.org/10.1145/1629607.1629613>

Li, Y.-T., & Whitworth, K. (2023). The right to information or data sovereignty? Sending unsolicited messages to Russians about the war in Ukraine. *Big Data & Society*, 10(1). <https://doi.org/10.1177/20539517231156123>

MediaMonks. (2020). *Reporters Without Borders: The Uncensored Playlist*. You Tube. <https://youtu.be/cPWMFBQFPLQ>

National Newspapers. (1999). *Convention for the protection of human rights and fundamental freedoms*. https://narodne-novine.nn.hr/clanci/medunarodni/1999_05_6_142.html

National Newspapers. (2000). *Law on Amendments to the Law on Libraries*. https://narodne-novine.nn.hr/clanci/sluzbeni/2000_10_104_2040.html

Open Observatory of Network Interference. (n.d.). *About*. <https://ooni.org/about/>

Panić, M. (2018). Censorship from Below: A contribution to the theoretical debate on censorship. *Journal of Croatian Librarians*, 60(4), 25–44. <https://doi.org/10.30754/vbh.60.4.526>

Reporters Without Borders. (2020). *The uncensored library: The digital home of press freedom*. <https://www.uncensoredlibrary.com/en>

Roskomsvoboda & Open Observatory of Network Interference. (2023). *How Internet censorship changed in Russia during the 1st year of military conflict in Ukraine*. <https://ooni.org/post/2023-russia-a-year-after-the-conflict/>

Roskomsvoboda. (2023). *Media harassment summary: June 2023*. <https://roskomsvoboda.org/post/smi-june-23/>

Rosson, Zach, Anthonio, F., Cheng, S., Tackett C., & Skok, A. (2023). *Weapons of control, shields of impunity: Internet shutdowns in 2022*. [accessnow.org https://www.accessnow.org/internet-shutdowns-2022/](https://www.accessnow.org/internet-shutdowns-2022/)

Reporters Without Borders. (2016). *Who are we?* <https://rsf.org/en/who-are-we>

Shahbaz Funk, A., Slipowitz, A., Vesteinsson, K., Buyon, N., & Grothe, C. (2020). *Acknowledgements: Freedom on the Net 2020*. Freedom House. <https://freedomhouse.org/report/report-sub-page/2020/acknowledgements-freedom-net-2020>

Stipcevic, A. (1992). History of censorship. In A. Stipcevic. *Censorship in libraries*. (pp. 137-147). Faculty of Philosophy, Department of Information Sciences.

V-Dem Institute. (2023). *Democracy Report 2023: Defiance in the Face of Autocratization*. https://www.v-dem.net/documents/30/V-dem_democracyreport2023_highres.pdf

Vojinović, I. (2023). *Internet Censorship: Definition, Types, and How It Can Affect You*. DataProt. <https://dataprof.net/articles/what-is-internet-censorship/>

Winter, P. (2014). *Measuring and circumventing Internet censorship*. <https://api.semanticscholar.org/CorpusID:107983841>

Records Management in Search of Efficiency in the Administrative Archive of the Archive of the University of Coimbra

*Isabel Cristina Guerra Correia Rostami*¹

ABSTRACT: This paper results of the work developed in the Administrative Archive of the Archive of the University of Coimbra (AUC). Driven by the difficulties and possibilities of information management in organizations, an intervention project was conceived to test the possibility of applying records management tools: NP 4438-1-2 and ISO INE TR 26122 standards - to identify and solve the records management problems of the administrative archive of the AUC. The work has a theoretical and a practical component. It began with an analysis of the literature to provide a theoretical foundation and to justify the choices made and, at the same time, collection and analysis of data based on the procedures set out in the Standards. Benefiting from the flexibility they provide, the intervention project followed the recommendations set out in NP 4432-1-2:2005 and ISO INE TR 26122, adapted to the needs and objectives defined. We confirmed the possibility of applying different document management tools to identify and solve document management problems in an organization with hybrid business processes. The work allowed us to discuss the contribution and complementarity of the different archival theories when we want to critically contribute to solving records management problems in organizations.

KEYWORDS: Archivistics, records management, standardization, Coimbra University Archive

¹ Faculty of Arts and Humanities of the University of Coimbra, Coimbra, Portugal.
E-mail: isa.c.souto@gmail.com | ORCID iD <https://orcid.org/0000-0002-5118-2460>
<https://doi.org/10.36311/2025.978-65-5954-624-4.p101-121>

INTRODUCTION

This article is the result of an intervention project carried out as part of the Master's programme in Information Science at the Faculty of Arts and Humanities of the University of Coimbra. It is therefore located in the scientific field of Information Science, more specifically Archivististics.

The choice of the intervention project resulted from the interest in carrying out a theoretical practical study that reflects the challenges currently facing archives and which, at the same time, could prove useful to the Organisation.

Among the challenges currently facing Archivististics, the ones that challenge us are the following:

- i) the archival theories that have emerged since the last decades of the 20th century; ii) the paradigm shift pointed out by some authors;

And the challenges faced by records management:

- i) that arise mainly from the complexification of organizations;
- ii) possibilities brought by the theoretical perspectives and the possibility of crossing them.

The increase in document production since the second half of the 20th century has led to the appearance and coexistence in organisations of documents associated with tasks that take place in both physical and digital environments. This reality has contributed to organisations resorting to standardisation as a necessity because it makes it possible to rationalise investments and increase the efficiency of procedures.

Therefore, the intervention project's main objective is to apply different but complementary records management tools to a specific situation, helping to increase the effectiveness of procedures and to meet identified needs in terms of managing archive documents.

This article is organised in four sections. The first section presents the history of archivististics and its relationship with efficiency, and discusses the theoretical issues related to the paradigm shift identified by some

authors, which involves moving from the primacy of the document to the primacy of information. The second section presents the methodology. The theoretical and practical aspects of the intervention project are based on a qualitative methodology. In this section, we justify the choice of project work, explain the object, the objectives to be achieved, the methodological procedures adopted and the techniques used. The third section presents the results in conjunction with the methodology and techniques used. In the fourth section, we discuss the intervention project results. Finally, we present the conclusions.

THEORETICAL FRAMEWORK

This work is theoretically based on Archivistics, a disciplinary area within Information Science.

Like any other area of knowledge, Archivistics is the result of the historical process of transformation it has undergone and is related to the social, political and economic contexts from which it emerges (Schmidt & Mattos, 2020).

If we take into account the chronology of the appearance of the terms Archivistics and Information Science or Information Management, we can conclude that the term Archivistics preceded the other two. From consulting *The Dictionary of Archives Terminology* da Society of American Archivists [SAA] (2023) we have retained the following definitions:

- i) *archival science* is understood as: “a systematic body of theory that supports the practice of identifying, acquiring, authenticating, preserving, and providing access to records of continuing value” (SAA, 2023).
- ii) for its part, *information science* is related to “study of the theory and practice of creating, acquiring, processing, managing, retrieving, and disseminating information, especially the use of computers to facilitate these processes” (SAA, 2023).

iii) and *information management* relates to “principles and techniques to process, store, retrieve, manipulate, and control access to information so that users can find information they need” (SAA, 2023).

The definitions above show an evolution towards access to documents being replaced by access to information, as can be seen in the last two definitions. Between access to documents and access to information lies records management.

The recognition by archival theory that information is a resource that adds value to organisations led to the emergence of information management and its integration into the *curriculum* of the Master’s Degree in Information Science at the Faculty of Arts and Humanities of the University of Coimbra (Borges & Freitas, 2020).

The Association of Records Managers and Administrators (ARMA, 2007) defines “Records and information Management - RIM” as the area of action of records managers, aimed at managing organisational documents, considered vital (“records”), for as long as they are needed and to meet the purposes for which they were created and used (Borges & Freitas, 2020, p.223). Borges e Freitas (2020) quote Oliver (2015) who “emphasises that the activities carried out in this area must be based on working together and using unified and consistent approaches to make the management of documents and information vital for day-to-day use and for the memory of organisations efficient and effective.” (p.224, our translation).

Although efficiency and effectiveness are not synonymous terms, while in general the term efficiency refers to the way in which a certain result is achieved, the term effectiveness refers to whether or not the objective is reached and whether that objective is really the one to be reached. The concept of effectiveness is especially relevant at a strategic institutional level - it’s important not only to do what you do well, but also to do what you should (Robalo, 1995).

Schmidt and Mattos (2020) identify the different epistemological approaches to Archivistics and quote Duranti (2005), who calls the first

approach “archives before archivistcs” (Duranti, 2005 cited by Schmidt & Mattos, 2020, p.29, our translation), placing it temporally between the invention of writing and the French Revolution (1789).

This is followed by the classic approaches that were in force until the end of the Second World War and which are characterised by: new uses for archive documents; the establishment of the principle *respect des fonds*; the idea of the archive; the principle of provenance and original order; the registration system; organicity; custody; ordering and description (Schmidt & Mattos, 2020).

Modern approaches lasted until the 1980s. They introduce modern records management, the life cycle, document evaluation and functional classification. Finally, in the last decade of the 20th century, we enter the contemporary theories of Archivistcs (Schmidt & Mattos, 2020).

We believe that following on from Schmidt and Mattos (2020), Araújo's (2013) perspective helps to complement the division and characterisation presented by the authors. Araújo (2013) considers that the first manuals and initiatives that denote changes in the way archives are conceived appear at the beginning of the 20th century. Thus “adjectives such as “living”, “dynamic” and “active” are beginning to be used to point in the direction of a necessary change to be made in the archives in order to combat their inertia and closure in on themselves” (Araújo, 2013, p.65, our translation).

The separation between historical archives and administrative archives was gradually dissolved from the beginning of the 20th century, together with the question of the functions of archives and their effectiveness. This was, however, a troubled and controversial path, and not before the split between the “traditional” view of archives and records management had been emphasised.

In Eugenio Casanova's *Archivistica*, dated 1928, the author does not separate the administrative archive from the historical archive - because the latter is a consequence of the former. Casanova (1928 cit. by Araújo, 2013) states that it is also the function of archives, in addition to collecting, processing and preserving documents, to do so “with less effort, saving labour

and making the most economical use of facilities, staff, time and managing costs" (Casanova, 1928 cited by Araújo, 2013, p.66, our translation).

The period between the First World War and the Second World War saw an increase in document production and, consequently, a concern with document appraisal as an imperative need that was inseparable from the question of the effectiveness of organisations. However, this activity was the responsibility of the producing organisation and was not the archivist's job (Araújo, 2013).

T. R. Schellenberg's work accentuated the split between the "traditional" perspective centred on historical archives in Latin European countries and a more pragmatic perspective in which the archivist intervenes in all types of archives. By introducing the concepts of primary and secondary value, Schellenberg contributed to preserving the maximum amount of information with the minimum number of documents. Consequently, a new field of archival science emerged: archival appraisal (Araújo, 2013).

The need to control the growth of document production led to the emergence of records management, i.e. the management of archival documents with the intervention of the archivist at the earliest age of the documents. Records management is therefore closely linked to administration and marked a break with archivististics, which until then had focused more on historical documentation (Araújo, 2013).

The evolution of Archivististics in the United States of America and Australia cannot be dissociated from the fact that administration documents in these countries were much more disorganised and that the principles of *respect des fonds* and provenance were not put into practice or applied, as was the case in the centuries-old tradition of European Archivististics - which had already provided the necessary theoretical and conceptual framework for archivististic work.

The emergence of the concepts *records group*, *records management* and *archival appraisal* provided American and Australian archivists with the necessary tools to solve an urgent problem. So much so that, in 1947, the US Congress created a specific group to deal with the problem of

records management. In 1950, the “doctrine” of *Records Management* was established, which prioritised administrative efficiency, distinguishing it from the theoretical and methodological approach to *documents* - documents with historical value.

In 1964, Peter Scott proposed abandoning the *record group* approach and adopting the series system, as he considered that the *record group* did not reflect the reality of document creation and use in environments with complex administrative changes, where multiple provenance is a frequent phenomenon. It proposes an approach to classification that allows description strategies to reflect the dynamic nature of document creation and that any set of documents can be viewed from various contextual perspectives (Schmidt & Mattos, 2020).

In addition to the exponential growth in the production of documentation and technological development, there are other factors that will mark the theoretical formulations in Archivistcs from the 1980s onwards. Archivistcs is confronted with new uses, values and functions of documents.

In Canada, in the 1980s, “integrated archival science” emerged, with Carol Couture, Jean-Yves Rousseau and Jacques Ducharme among its main representatives. This trend rejects the division created by modern American archivistcs between records and archives and aims to make archivistcs a scientific discipline. It argues that information management should subsidise document management and the union of primary and secondary value for an “expanded definition of archive” (Tognoli & Guimarães, 2010, p.16, our translation).

The functional or post-modern archival approach assumes the influence of the subject in document production and, consequently, the document is no longer considered an impartial and neutral construct. Functional analysis focuses on the process of document creation rather than the document, considers digital documents and new forms of document production, proposes macro-appraisal and analysis of the production context, and the concept of background becomes dynamic. Terry Cook,

Hugh Taylor and Tom Nesmith are some of the representatives of this approach (Tognoli & Guimarães, 2010, pp.7-10).

We conclude this tour of some of the theoretical approaches in contemporary archivistcs with the *records continuum* model, developed by Frank Upward in 1995. This model was based on Peter Scott's "series system" approach (Gilliland, 2014 cited by SAA, 2023).

According to Anne Gilliland (2014), the *records continuum* is a descriptive model that provides a complex and holistic way to think about the nature, role, use, and life of records, regardless of their media, as they exist and constantly interact across four dimensions: create, capture, organize, and pluralize (Gilliland, 2014 cited by SAA, 2023)

The *records continuum* rejects the life cycle theory as a linear and fragmented view. From this perspective, the archive document is a logical and non-physical entity and its management is continuous. This gives rise to the concept of *life continuum*, defined as

The unified pattern of a record's life, comprised of four interrelated stages: creation or receipt; classification; scheduling and its implementations, including maintenance in the creating office, an active storage area or records center, or an archives; and use (primary or secondary) (SAA, 2023)

As we can see, the separation between current and permanent documents is also rejected. Consequently, at a professional level, the separation between records managers and archivists no longer makes sense.

This model enables accountability in two ways: a) by conceptualising document interactions and identifying the path of documents in all their dimensions - creation, capture, organisation and pluralisation - it makes the document available as evidence; b) by identifying all the axes that represent different facets of accountability - the identity of the entity involved in a transaction documented by the records, what that entity's intervention consisted of, what evidence is made available by the documents, how the documents are found and retrieved for later use (SAA, 2023).

This journey would not be complete without reference to Theo Thomassen, who argues that archivistcs as a science is distinguished

from other sciences by the objectives it pursues, its object of study and its methodology. The object of study is information in its relationship with the process that generates it, which structures it and the circumstances in which this phenomenon occurs. Its aim is to analyse documents as products and producers of social activities in order to establish, develop and preserve their quality and that of the archives [...] (Thomassen, 2006).

As far as the methodology is concerned, it involves chain analysis of the links established “between information and documents, documents and other documents, documents and work processes and work processes and their social environment” (Thomassen, 2006, p.14, our translation).

Therefore, we believe that the fundamental aspect of this whole journey has been to transfer the value of the document to the value of the information contained in the document.

In Portugal the issue of the effectiveness of organisations and archives is a current and pressing issue that has accompanied the government's administrative modernisation policies.

The first moment was the “Lei de Bases da Reforma Administrativa” of the Second Constitutional Government, of 1978, which set “the objectives of rationalising circuits, making things easier for the public, simplifying processes [and procedures], generalising information services and reducing bureaucracy in services” (Silva, 2008, p.3, our translation). Between 1983 and 1985, the IX Constitutional Government focused on meeting the needs of users and recognising their rights (Silva, 2008).

For Silva (2008), the concept of administrative modernisation as “effective service provision, humanized service, timely and rapid satisfaction of users' requests” (p.4, our translation) is in line with what quality advocates - which sees the relationship between the administration and the administered as a relationship between organisations and their customers.

Still according to the author, quality, at least since 1999, has been understood as “a management philosophy that makes it possible to achieve greater effectiveness and efficiency in services, to reduce bureaucracy and

simplify processes and procedures and to satisfy the implicit needs of the citizen." (Silva, 2008, p.4, our translation).

From the 1990s onwards, quality became part of the lexicon of modernisation and administrative reform policies, now combined with eGovernment (Information Society) and the "Technological Plan". At the same time, legislation aimed at administrative modernisation and quality emerged with the aim of standardising processes and procedures (Silva, 2008).

Portuguese archives and archivists are no strangers to this context, and are now including administrative modernisation and quality management among their concerns. Silva (2008) cites as an example the communication by Pires de Lima (1997), in which the author warns of the urgent need for archivists to integrate records management into their work (Silva, 2008, p.4).

According to Penteado (2015), a paradigm shift in national archival policy began in 2005, triggered by the diagnosis of the central administration's intermediate archives, carried out a few years earlier. The diagnosis identified "a set of deficient practices in the management of archival information, which needed to be changed quickly" (Penteado, 2015, p.123, our translation). To this end, the then Direção-Geral de Arquivos (DGARQ) designed a set of strategies to promote the qualification of national archive systems.

The appearance in Portugal of NP 4438-1-2 in 2005 is a milestone for records management. The standard is presented as a guide that contributes to the management and organisation of documents from a quality perspective, in line with ISO 9001 and ISO 14001. It emerged from the production of ISO 15489-1, which resulted from the need to regulate the chaotic situation experienced in Australian archives. NP 4438-1-2:2005 presents a set of recommendations that allow organisations to implement records management systems while maintaining the characteristics of an archive document. Its general aim is to ensure that documents are created, organised and archived in a relevant manner. According to Sousa (2022):

*The vector for the spread of the functional approach and functional analysis was the first version, in 2001, of the ISO 15.489-1 standard, which clearly recommended that the development of the classification plan for archive documents should be based on an analysis of functions, activities and work processes. This was followed by ISO 26.122:2008, entitled **Analysis of work processes for document management**, which provided guidance on how to carry out a functional analysis of organizations. (p.7, our translation)*

RESEARCH METHODS AND OBJECTIVES

The theoretical and practical aspects of the intervention project are based on a qualitative methodology.

In the first phase, prior to defining the intervention strategy, we analysed the literature resulting from bibliographic searches carried out in the Repositórios Científicos de Acesso Aberto em Portugal (RCAAP), Repositório científico da UC (Estudo Geral), Biblioteca do Conhecimento ON-Line (B-ON), Base de Dados Referencial de Artigos de Periódicos em Ciência da Informação (BRAPCI) and the EBSCO database. Analysing the literature made it possible, firstly, to substantiate the choice of project work and, subsequently, to support the theoretical basis of the theme chosen for the work project and the choices made in the intervention strategy.

Project work provides the opportunity to develop professional competencies based on concrete problems that require the development of critical thinking, research skills, the integration of theory and practice and the ability to adapt to a dynamic reality.

According to Terra (2022), “since the 1970s, a new profile has been advocated for the professional responsible for managing the entire life cycle of information in the most diverse contexts” (p.56, our translation). Project work has advantages identified by authors such as Moylan, who points to critical thinking and problem-solving orientation, creativity and innovation as some of the professional competences that this type of academic work enables to be developed.

Given the characteristics that we have been able to identify and attribute to the project work, we consider it to be part of a qualitative methodology. Since “[w]hat defines an investigation of this nature is the fact that the data obtained is not quantified, measured or counted for inferential purposes” (Freitas, 2009, p.61, our translation). We also see a convergence with the characteristics identified by Flick (2007), for whom “Qualitative research is recognised by the fact that it has different ways of confronting reality, with a view to understanding it holistically” (Flick, 2007 cited by Freitas, 2013, p.1086, our translation).

The agreement with the qualitative methodology can also be found in the procedures adopted, since we followed the recommendations of NP4438-1-2:2005 and UNE ISO TR/26122:2008, adapting them to the defined objectives and the context of the organisation. This is because the standards present a model to follow, but also allow flexibility and adaptation to the organisational context.

We therefore agree with Strauss and Corbin (2002 cited por Freitas, 2013,) when they consider that

There are at least three components that characterise qualitative research [...]: the peculiar way of collecting data, suggesting different sources; the way of reducing and interpreting it, generating conceptual constructs; the way of communicating the results, focusing on descriptive and interpretative aspects of reality.” (p.1087, our translation).

Data collection and the techniques used to comply with the standards consisted of on-site observation; unstructured interviews; documentary research and analysis based on standards NP 4438-1-2:2005 and AENOR IT 26122:2008.

The main objective it's apply different but complementary records management tools to a specific situation, helping to increase the effectiveness of procedures and to meet identified needs in terms of managing archive documents. The application exercise took place at the University of Coimbra Archive (AUC) Secretariat.

To achieve the main objective, the following specific objectives were formulated: a) identify the records management needs of the administrative archive of the AUC; b) integrate the records management instruments NP 4438-1-2:2005 and UNE ISO TR/26122:2008 into the proposed solution for the records management needs identified; c) contribute to solving the needs identified on the basis of the records management tools and the context of the organisation.

The research question is: How is it possible to integrate and apply the NP 4438-1-2:2005 and UNE ISO TR/26122:2008 records management tools in the administrative archive of the AUC?

The following questions were also asked:

- a) What are the records management needs of the administrative archive of the AUC?
- b) How are the NP 4438-1-2:2005 and UNE ISO TR/26122:2008 records management tools used to solve the records management needs identified?
- c) What are the contributions to solving the needs identified based on the records management tools and the context of the organization?

In order to answer the above questions, it was also necessary to answer the following questions:

- a) how are business process mapping and Classificação e avaliação da informação pública (CLAV) Lista consolidada (LC) integrated/related within the implementation of an organisation's records management system?
- b) How are business processes, CLAV (LC), quality management and strategic planning linked in an organisation?

FINDINGS

The methodology was applied as follows.

The research was carried out during the 2022/2023 school year.

The first task of the project work consisted of a preliminary study that allowed for the diagnosis of the main records management difficulties experienced at the AUC Secretariat. This first, more general analysis, supported by on-site observation, unstructured interviews and document analysis, enabled the definition of the object of work, the objectives to be achieved, as set out above, and the intervention strategy.

The main difficulty identified was the need to describe processes and procedures, classify and evaluate them.

After identifying the needs, the business processes targeted for intervention were selected according to the established criteria, namely:

- i) those identified as core;
- ii) those with the highest number of occurrences in requests addressed to the AUC;
- iii) those that are specific to archival work and directly related to AUC's functions as a District Archive;
- iv) those which, given their demand and complexity, would benefit most from the intervention carried out.

The strategy intervention was then outlined.

We used the same methodology and methods as above: on-site observation, unstructured interviews and document analysis, and added the use of the UNE ISO/TR 26122:2008, NP 4438-1:2005 and NP 4438-2:2005 as guidelines for the intervention strategy to be developed and with the aim of constituting a documentary *corpus* that would respond to the needs of the service and the normative requirements.

Specifically: UNE ISO TR/26122:2008 presents the methodology for analysing business processes with a view to records management (AENOR, 2008). A functional and sequential analysis of the business processes was carried out, preceded by a study of the organisation's context, in line with what is also proposed by NP 4438-1-2:2005.

For a better understanding of the context in which the work project took place, we present a summary characterisation of the AUC.

The AUC is an organisational unit of the University of Coimbra (UC), under the supervision of the Rectorate. The UC is a legal person governed by public law, with its headquarters in Coimbra, in the Paço das Escolas.

The AUC is a centuries-old institution, recognised for its rich documentary heritage. It is known above all as an institution of memory and culture. However, like all other institutions of its kind in activity, it has a current or administrative archive which sets in motion a set of procedures that allow the definitive Archive to fulfil its functions.

The SAA Dictionary defines the term “function” and the term “competence” as “The activities of an organisation or individual performed to accomplish some mandate or mission” (SAA, 2023).

From the analysis carried out, we can see that during 2023, around 6,821 requests were received only via the formally established (Request Ticket), i.e. not counting requests that reached the AUC via other channels (telephone, emails from employees, the Board, etc.), among which the following types of requests stand out: issuing certificates, endorsements, reservations or advance seat reservations, information and reproduction of documents, document loans and acquisitions. The types of requests identified are related to the functions, competences and activities of the AUC and constitute business processes, and it was on these that we developed the intervention strategy.

The NP 4438-1:2005 provides public and private organisations with the guiding principles for document management (IPQ, 2005a). NP 4438-2:2005 presents an eight-stage methodology. Of the eight stages, in the intervention project we concentrated on the first five: “Stage A: Preliminary investigation”; “Stage B: Functional analysis”; “Stage C: Identification of archive document requirements”; “Stage D: Evaluation of existing systems” and “Stage E: Identification of strategies to fulfil archive document requirements”.

As a result, and in fulfilment of the recommendations of “Stage A: Preliminary Investigation”, we decided to create *Modelo para Estrutura de Processos ou Procedimentos*². We reached this conclusion based on document analysis, interviews and on-site observation, actions that allowed us to understand the “administrative, legal, functional and social contexts” (IPQ, 2005b, p. 11, our translation) of the AUC.

The functional analysis, provided for in Step B, aims to demonstrate how the documents relate to the organisation’s activities and business processes, resulting in a description of the activities and business processes selected. Stage B also recommends defining a functional classification scheme that shows the organisation’s functions, activities and transactions. To fulfil this objective, in addition to using the methodology recommended by ISO INE TR/26122, we also used the Lista Consolidada³ (LC) available at Classificação e Avaliação da Informação Pública⁴ (CLAV)⁵. Instruments made available by the Direção-Geral do Livro, dos Arquivos e das Bibliotecas (DGLAB).

“Stage C: Identification of archive document requirements” aims to “identify and document in a structured way an organisation’s requirements for producing, receiving and retaining archival documents” (IPQ, 2005b, p.12, our translation). A systematic analysis of organisational needs and legal and regulatory obligations is necessary to ensure that only the appropriate documents are kept for the proper conduct of activities and to guarantee the legal and administrative accountability of individuals and the organisation. The *Model for the Structure of Processes or Procedures* in its entirety, i.e. taking into account all its fields, makes it possible to control the production, receipt, processing, maintenance and destination

¹ Our translation: Process or Procedure Structure Model.

² Our translation: The LC is a hierarchical structure of classes that represent the functions, sub-functions and business processes carried out by the Public Administration, including their description and evaluation. Its purpose is to serve as a reference for the development of organisational or multi organisational instruments for classifying and evaluating public information (Lourenço et al., 2019a).

³ Our translation: “Modular platform for classifying and evaluating public information Plataforma” which, as part of the country’s administrative modernisation, is part of the Simplex+ programme, which aims to simplify and dematerialise administrative processes (Lourenço, et al., 2019b).

⁴ CLAV is a collaborative platform which we used to gather data on the selected business processes in terms of description, classification and evaluation. Available at: <https://clav.dglab.gov.pt/>

of archive documents, thus contributing to their reliability, authenticity, integrity and utilisation.

“Stage D: Evaluation of existing systems” was carried out by collecting information in Stage A, which made it possible to identify the organisation’s existing information systems. Subsequently, by assigning responsibility for the custody of the documents/records, identifying the support, location, administrative retention period, recording changes to the document and other meta-information elements contained in the *Model for the Structure of Processes or Procedures*, we sought to eliminate any possible discrepancies between the requirements for archive documents and what the existing systems allow.

Lastly, “Stage E: Identifying strategies to fulfil the requirements of archive documents”. The identification of the strategy took into account the analysis of the organisation and the objectives of this project work and consists of the description of the intervention strategy adopted and presented here.

We consider the proposed *Model for the Structure of Processes or Procedures* to be a strategy (Stage E) for “fulfilling the requirements of archive documents” (IPQ, 2005b, p.12, our translation) that brings together and synthesises the recommendations found in the Stages we are focusing on.

DISCUSSION

Given the characteristics of the AUC as a UC organisation and the activities it carries out, arising from the duties conferred on it as a District Archive and University Archive, the theoretical and methodological principles defended by the post-custodial theories of Archivistics - *records continuum* and Functional Archivistics - are adapted to the reality of this organisation, especially when the aim is to contribute to the implementation of a records management system aligned with the Quality Policy of the UC⁶ and with the policies of the DGLAB. This conclusion

⁶ In the Estatutos da Universidade de Coimbra, republished by Despacho normativo n.º 8/2019, the UC introduces Quality Management as a management practice.

also stems from the results obtained from combining the resources used - LC, CLAV and records management standards in the intervention project. The LC was inspired by the theoretical model of functional classification and, on a practical level, by the work carried out by the National Archives of Canada. On the other hand, since the business process is at the centre of all the actions carried out by records management, its dissection supported by the functional and sequential analysis recommended by ISO INE/TR 26122:2008 in conjunction with NP 4432-1-2:2005 made it possible to fill the gaps in the records management.

Bustelo Ruesta (2012) argues that in ISO standardisation, the orientation followed by TC46/SC11 was defined by ISO 15489, which translates into the inclusion in records management of document processes and controls, right from the creation of the document or even before and with the main objective “the integration of records management into work processes” (Bustelo Ruesta, 2012, p. 43, our translation). Changing times, technology and management methods have meant that strategic thinking has integrated records management and records management has integrated business processes (Bustelo Ruesta, 2012).

Moro Cabero and Llanes Padrón (2018) advance with the idea that the set of standards of which ISO TR 26122 and 15.489 are a part respond to the need to “build, implement and certify quality and business excellence” (Moro Cabero & Llanes Padrón, 2018, p.214, our translation), since a large part of the archives are understood as “information units and centres whose administration is subject to accountability, which includes an interest in demonstrating quality management and excellence” (Moro Cabero & Llanes Padrón, 2018, p.214, our translation).

With regard to the distinction between “current archives” and “historical archives”, we agree with Rousseau and Couture (1998) when they refer to the problem of the notions of primary and secondary value of documents and warn that these can lead to “an intellectual shortcut that must be avoided [...].” (p.123, our translation). The authors believe that associating primary value with active or semi-active documents and secondary value with documents that are part of definitive archives, is a pernicious simplification when put in simplistic terms. We proved this

premise when we began this project and therefore agree with the authors when they argue that “even when, at first glance, the definitive archives are no longer useful to the administration that produced them, we will see that their qualitative contribution is undeniable and that the administration must be able to count on them.” (1998, p.123, our translation).

CONCLUSION

We conclude that the application of the adopted methodology to a concrete work environment is possible and even beneficial for archival work, resulting in the achievement of the formulated objectives.

We also found that the methodology has a strong interpretative bias, which implies, for its good application, the knowledge of epistemology and Archival Theory, as well as the organizational culture of the institution. From a theoretical point of view, the practical work was based on literature from not only the *records continuum* and functional or post-modern archival theoretical approach, but also integrated archival science. We therefore believe that the contributions of the different streams of contemporary archivististics, depending on the objectives set by each organisation with regard to optimising document management, are complementary rather than competing.

REFERENCES

Araújo, C. A. Á. (2013). Correntes teóricas da Arquivologia. *Encontros Bibli: Revista eletrônica de biblioteconomia e ciência da informação*, 18(37), 61-82.

Association of Records Managers and Administrators (ARMA). Glossary of Records and Information Management Terms. 3rd. ed. Lenexa, KS: ARMA international, 2007.

Asociación Española de Normalización y Certificación. (2008). *UNE-ISO/TR 26122 IN Información y documentación: Análisis de los procesos de trabajo para la gestión de documentos*. AENOR.

Borges, M. M., & Freitas, M. C. V. de. (2020). Relatos de experiência de Gestão da Informação na Universidade de Coimbra. In E. N. Duarte, A. K. A. da Silva, R. A. da S. Llarena, S. de L. Lira, R. A. de B. Feitoza, & C. M. F. de Almeida (Org.). *Componentes curriculares do eixo temático da gestão na pós-graduação em Ciência da Informação, no Brasil, Espanha e Portugal* (pp. 215-240). Editora UFPB. <http://hdl.handle.net/10316/93314>

Bustelo Ruesta, C. (2012). La normalización internacional en información y documentación: ¿una historia de éxitos? El caso de la normalización ISO en gestión de documentos. *Métodos de información*, 3(4), 39-46. <https://doi.org/10.5557/IIMEI2-N2-039046>

Freitas, M. C. V. de. (2009). *A Arquivística sob o sinal da mudança: Cenários arquivísticos (re) desenhados pelo documento eletrônico* [Tese de doutoramento, Universidad de Salamanca]. <http://gredos.usal.es/jspui/handle/10366/76594>

Freitas, M. C. V. de. (2013). Investigação qualitativa: contributos para a sua melhor compreensão e condução. *Indagatio Didactica*, 5(2), 1080-1101. <https://doi.org/10.34624/id.v5i2.4493>

Instituto Português da Qualidade. (2005a). *NP 4438-1:2005: Informação e documentação: Gestão de documentos de arquivo: Parte I: Princípios directores*. IPQ.

Instituto Português da Qualidade. (2005b). *NP 4438-2:2005: Informação e documentação: Gestão de documentos de arquivo: Parte II: Recomendações de aplicação*. IPQ.

Lourenço, A., Melo, D. de, Neves, H., Ribeiro, M., Antónia, N., & Penteado, P. (2019a). *Orientações para a aplicação de tabela de seleção derivada da Lista Consolidada*. DGLAB. https://arquivos.dglab.gov.pt/wpcontent/uploads/sites/16/2019/10/Orientacoes_apli_cacao_TS_20191002.pdf

Lourenço, A., Ramalho, J. C., Gago, M. R., & Penteado, P. (2019b). Plataforma CLAV: contributo para a disponibilização de dados abertos da Administração Pública em Portugal. *Cadernos BAD*, 2, 19-44. <https://doi.org/10.48798/cadernosbad.2047>

Moro Cabero, M., & Llanes Padrón, D. (2018). La importancia de la normalización para el ejercicio profesional del archivista. *Investigación Bibliotecológica: Archivonomía, bibliotecología e información*, 32(74), 193-223. <https://doi.org/10.22201/iibi.24488321xe.2018.74.57919>

Penteado, P. (2015). Gestão de documentos de arquivo na administração pública em Portugal: experiência e desafios. *Acervo: Revista do Arquivo Nacional*, 28(2), 121-133. <https://revista.an.gov.br/index.php/revistaacervo/article/view/612>

Robalo, A. (1995). Eficácia e eficiência organizacionais. *BRU-RN: Artigos em revistas científicas nacionais com arbitragem científica*, 266(II-III), 105-116. <http://hdl.handle.net/10071/1383>

Rousseau, J.-Y., & Couture, C. (1998). *Os fundamentos da disciplina arquivística*. Dom Quixote.

Schmidt, C. M. dos S., & Mattos, R. de. (2020). A construção do pensamento arquivístico: Entre textos e contextos. In A. C. A. Mariz, & T. R. Rangel (Org.). *Arquivologia: Temas centrais em uma abordagem Introdutória* (pp. 27-47). FGV Editora.

Silva, C. G. da. (2008, Abril 24). O papel da arquivística na gestão da qualidade das organizações [Comunicação]. Convergindo. In *2.º Seminário Nacional de Arquivos, Bibliotecas, Centros de Documentação e Museus*, Maputo. https://www.academia.edu/5121065/O_Papel_da_Arquiv%C3%ADstica_na_Gest%C3%A3o_da_Qualidade_das_Organiza%C3%A7%C3%A7%C3%B5es

Society of American Archivists. (2023). *Dictionary of Archives Society of American Archivists*. SAA. <https://dictionary.archivists.org/>

Sousa, R. T. B. de. (2022). A classificação funcional de documentos de arquivo é uma abstração intelectual ou um instrumento prático? *Acervo*, 35(2), 1-21. <https://revista.an.gov.br/index.php/revistaacervo/article/view/1809>

Terra, A. L. (2022). Aprendizagem baseada em projetos: uma experiência pedagógica na área da Ciência da Informação. *Páginas a&b: Arquivos & Bibliotecas*, 17, 54-72. <https://doi.org/10.21747/21836671/pag17a4>

Thomassen, T. (2006). Uma primeira introdução à arquivologia. *Arquivo & Administração*, 5(1), 5-16. <https://brapci.inf.br/#/v/51643>

Tognoli, N. B., & Guimarães, J. A. C. (2010). Arquivística pós-moderna, diplomática arquivística e arquivística integrada: Novas abordagens de organização para a construção de uma disciplina contemporânea In *XI Encontro Nacional de Pesquisa em Ciência da informação. Inovação e inclusão social: questões contemporâneas da informação*. <https://brapci.inf.br/#/v/176886>

The Convergence of Digital Transformation and Sustainability: the Role of Information Professionals in Building a More Sustainable Future

*Janaína Fernandes Guimarães Polonini*¹

*Carla Conforto de Oliveira*²

*Bárbara Souza da Silva*³

ABSTRACT: Digital transformation has caused significant impacts in several areas of society, including environmental sustainability. The convergence of these two fields opens up new possibilities to face environmental challenges and seek innovative and sustainable solutions. In this context, the information professional must promote sustainable practices, ensuring that access to information and the use of digital technologies are aligned with the objectives of preserving the environment. This study aims to investigate the role of information professionals at this intersection, exploring sustainable practices and innovations to face environmental challenges. The research is bibliographic with a qualitative approach. The theoretical framework was retrieved from the Capes Periodicals Portal (a Brazilian and nationally recognized database, being of great relevance), in addition to consultations

¹ São Paulo State University, Marília, Brazil.
E-mail: janaina.polonini@unesp.br | ORCID iD <https://orcid.org/0000-0003-4174-8042>

² São Paulo State University, Marília, Brazil.
E-mail: carla.conforto@unesp.br | ORCID iD <https://orcid.org/0000-0003-2960-9429>

³ São Paulo State University, Marília, Brazil.
E-mail: bs.silva@unesp.br | ORCID iD <https://orcid.org/0000-0003-2835-5295>

<https://doi.org/10.36311/2025.978-65-5954-624-4.p123-145>

in manuals and specialized dictionaries on the proposed topic. It is considered that in the implementation of sustainable digital transformation in information environments, strategies such as Digitization and Operational Digitalization, Awareness, Training, Monitoring and Evaluation, Network Participation and Continuous Update stand out. By adopting innovative technologies, promoting sustainable practices and establishing strategic partnerships, these professionals are aligned with current demands and leading the way towards a more efficient, accessible and eco-conscious future.

KEYWORDS: digital transformation; sustainability; information professional; sustainable practices.

INTRODUCTION

Archives, documentation centers, museums, and libraries serve society as centers of knowledge, education, and culture. The significance of these institutions extends beyond the mere preservation of books; they are dynamic spaces that promote democratic access to information and contribute to the formation of informed and culturally enriched citizens.

The constant renewal of collections, the incorporation of new technologies, and the provision of innovative services are key elements that keep these institutions attractive both to investors and avid readers seeking knowledge. Thus, archives, documentation centers, museums, and libraries are institutions that foster the development of more educated, technologically updated, and sustainability-oriented societies.

Investing in the modernization and sustainability of these spaces is, therefore, an investment in the progress and quality of life of the communities they serve. The advent of technology, especially from the second half of the 20th century, introduced automated cataloging systems and the computerization of collections, facilitating access to and management of information.

The increasing pace of technological change makes digital transformation necessary for the sustainability and competitiveness of organizations. Those that resist or do not embrace this process risk becoming disadvantaged in a dynamic market environment (Sebastian et al., 2020). Digital transformation optimizes processes, improves operational efficiency, and opens new opportunities for innovation, enhanced

customer experiences, and adaptation to market demands. Institutions that overlook this aspect may become outdated, losing efficiency and the ability to remain relevant in an increasingly digitalized and technology-driven business environment (Sebastian et al., 2020).

Currently, archives, documentation centers, museums, and libraries incorporate digital technologies, offering access to online resources such as learning centers, and providing a dynamic environment for research and education. In this context, information professionals must promote sustainable practices, ensuring that access to information and the use of digital technologies are also aligned with environmental preservation goals.

In this way, this article addresses the importance of these dynamic centers of knowledge, education and culture, highlighting their role in promoting digital transformation and sustainability. It analyzes how the convergence of these fields offers unique opportunities to address environmental challenges. The objective of the study is to investigate the role of information professionals at this intersection, exploring sustainable practices and innovations to confront environmental challenges.

DIGITAL TRANSFORMATION AND SUSTAINABILITY

Digital transformation has had significant impacts on various areas of society, including environmental sustainability. The convergence of these two fields opens new possibilities for addressing environmental challenges and seeking innovative and sustainable solutions. In this context, Inácio, Rolim, and Serralvo (2022) highlight the transformation process, which comprised three phases related to digital transformation:

Kurt Lewin, a researcher at the Massachusetts Institute of Technology (MIT), in 1947, presented the change process as being composed of three phases: unfreezing the present state, moving to the new level and consolidation at this new level. The first phase corresponds to the necessary disposition for change to occur, it means discovering a problem and taking action. The second phase involves really wanting to make the change even if the process is arduous and difficult. The third and final phase concerns the

acceptability of the change. These three phases become very present in the analysis of DT, especially when the organizational culture has difficulties and even blocks in accepting innovation or change (Inácio et al., 2022, p.2, our translation).

It is evident that achieving digital transformation requires an understanding of the current landscape, demonstrating availability, perseverance, and openness to change. According to Verhoef et al. (2021), digital transformation encompasses three stages: digitization, digitalization, and digital transformation. Although the terms “digitization” and “digitalization” are often used interchangeably, they have distinct meanings in the context of digital transformation and document preservation.

Digitization refers to the specific process of converting analog information, such as paper documents or physical images, into a digital format. This procedure is carried out using a scanner or other capture devices, converting the information into binary data that is understandable by digital systems. “[...] we define digitization to describe the action to convert analog information into digital information. [...]” (Verhoef et al., 2021, p.891).

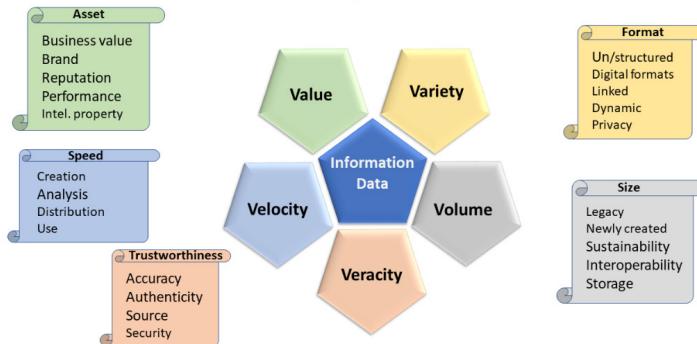
On the other hand, digitalization involves incorporating digital technologies into various aspects of an operation or process to enhance efficiency, automation, and accessibility. While digitization is a specific step in the transition to digital format, digitalization entails a broader transformation, encompassing the integration of digital systems into everyday practices to promote a more modern and effective approach. As Savic (2021) states, “Digital transformation is about doing things differently — creating a completely new business model by using modern information and computer technologies.” This process includes essential elements such as digital resources, organizational structure, growth strategy, metrics, and objectives (Verhoef et al., 2021).

Savic (2021) addresses the topic of “Digital Assets” and highlights the extensive impact of digital transformation on all five characteristics of these assets. The change is reflected in the increase in the quantity of digital products, the expansion of their volume, the evolution of their

accuracy, the acceleration of their speed, and the alteration of their value (Savic, 2021).

Figura 1: 5 Vs do Big Data. *Source: Savić (2021).*

5 Vs of Data/Information



Digital transformation is, therefore, influencing various aspects related to digital assets, from their quantity to their value, in a constantly evolving scenario (Savic, 2021). It is important to note that digital transformation includes considerations such as cloud computing (storing and accessing data and applications over the internet, on remote servers, offering flexibility and scalability), artificial intelligence (using algorithms to simulate human intelligence, automating tasks, learning from data, and making decisions) (Sawaya, 1999), big data (processing and analyzing massive data sets to extract insights, identify patterns, and inform strategic decisions), the Internet of Things (connecting devices to the internet, enabling data exchange and remote control, and expanding the interconnection between objects and environments), and virtual reality (creating immersive virtual environments through computational technologies, providing realistic sensory experiences) (Sawaya, 1999), among others. These elements in digital transformation represent technological advancements that impact interaction, information processing, and activity management across various sectors.

When considering the perspective of sustainability, the term, which originated in the 1980s, gained prominence following the report "Our

Common Future,” led by Gro Harlem Brundtland (Comissão Mundial Sobre Meio Ambiente e Desenvolvimento - CMMAD, 1988). In this context, sustainability is defined as “[...] meeting the needs of the present without compromising the ability of future generations to meet their own needs [...]” (CMMAD, 1988, p.46).

According to the Brundtland Report (CMMAD, 1988), sustainable development is “[...] a process of change in which the exploitation of resources, the direction of investments, the orientation of technological development, and institutional change are all in harmony and enhance both present and future potential, in order to meet human needs and aspirations” (CMMAD, 1988, p.49).

Since then, the concept has evolved and been widely adopted across different sectors, including business. “In recent years, the theme of sustainability has become a central topic for humanity, aiming to foster healthy and conscious relationships between humans and the environment and, consequently, to ensure quality of life for future generations” (Geraldo & Pinto, 2019, p.6). The application of sustainability in businesses occurs through the incorporation of practices and strategies that aim to balance economic, social, and environmental considerations. “Governments around the world are called upon to formulate legislation, public policies, and development models that allow progress in the present without compromising the future of the planet” (Souto & Pizzol, 2019, p.3). Initially, environmental concerns predominated, leading to the implementation of measures for waste reduction, energy efficiency, and minimization of environmental impact.

As awareness of corporate social responsibility has grown, companies have begun to address environmental and social concerns. Corporate sustainability now includes practices such as social responsibility, diversity and inclusion, ethical working conditions, and operational transparency.

Furthermore, sustainability in businesses involves developing long-term strategies that promote economic growth while considering the well-being of local communities and the global impact of operations. Transparent disclosure of sustainable practices, obtaining certifications,

and participating in global initiatives are common ways to demonstrate a company's commitment to sustainability.

Currently, corporate sustainability is considered an essential part of corporate management, as a response to social demands and a strategic approach to ensuring long-term resilience and prosperity. Sustainable companies minimize their negative impact and contribute positively to socioeconomic and environmental development.

Sustainable development, as conceived by the United Nations (UN), is a holistic approach aimed at meeting present needs without compromising the ability of future generations to meet their own demands. Officially launched in 2015, the UN's 2030 Agenda for Sustainable Development sets forth 17 Sustainable Development Goals (SDGs), addressing areas such as poverty eradication, zero hunger, health and well-being, quality education, gender equality, clean energy, and social justice (United Nations in Brazil, 2015).

The UN mobilizes international efforts, promotes partnerships, and monitors global progress towards a more equitable, inclusive, and environmentally conscious future (United Nations in Brazil, 2015). This initiative represents a collective commitment to addressing the complex and interconnected challenges humanity faces, establishing a sustainable path for global development (United Nations in Brazil, 2015).

RESEARCH METHODS AND OBJECTIVES

Thus, the article examines the significance of these dynamic centers of knowledge, education, and culture, emphasizing their role in advancing digital transformation and sustainability, and analyzing how the convergence of these fields presents unique opportunities to address environmental challenges. The study seeks to investigate the role of the information professional at this intersection, exploring sustainable practices and innovations to tackle environmental issues.

In this context, the question arises: How can the information professional harness the intersection of digital transformation and

sustainability to foster sustainable practices, ensuring access to relevant information and the prudent use of digital technologies in support of environmental preservation? To address this question, a literature review was conducted through a bibliographic survey on the CAPES Journal Portal, along with consultations in specialized manuals and dictionaries on the proposed topic. The CAPES portal was selected due to its extensive virtual scientific collection, which includes content from Brazil, international publishers, and national research and educational institutions. It encompasses over 50,000 journals and 455 databases, making it a prestigious national repository with diverse and high-quality content.

For the theoretical foundation, only peer-reviewed scientific articles, available in open access from 2018 to 2023, in English, Spanish, and Portuguese, were utilized. The initial search with the terms “digital transformation” and “environmental sustainability” identified 31 articles. The phrases “transformação digital” and “sustentabilidade ambiental” yielded only four articles, and no articles were found with the terms “transformação digital” and “sustentabilidade ambiental” and “profissional da informação,” nor “digital transformation” and “environmental sustainability” and “information professional.” Despite these search limitations, including database use, time frame, language, and access type, the results indicate a need to further explore the role of the information professional in promoting sustainable practices, ensuring access to relevant information, and advocating the prudent use of digital technologies to effectively contribute to environmental preservation.

The selected articles were used critically, contributing to the development of the theoretical framework, underpinning the study, or providing pertinent comparisons to enhance the discussion and conclusions.

THE INFORMATION PROFESSIONAL IN THE DIGITAL AGE: SUSTAINABLE PRACTICES

In the Digital Era, the role of the Information Professional is essential, characterized as an individual with specific training to handle data, information, and knowledge, as well as to mediate these elements

(Valentim, 2004). In this context, it is necessary for the information professional to adopt an investigative and critical stance, allowing for a natural adaptation to contemporary dynamics (Valentim, 2004).

Archives, documentation centers, museums, and libraries, traditionally considered guardians of knowledge, have evolved into agents of change, promoting both digital transformation and sustainability. The constant renewal of collections represents a dynamic approach to meeting the evolving demands of clients. No longer limited to printed volumes, these institutions now incorporate digital resources, e-books, and online databases, providing instant access to diverse information.

The information professional is faced with the Big Data phenomenon, and this scenario is characterized by extremely dense volumes of data that require skills, abilities and tools so that this information can be found; for this to be possible, it needs to be treated, analyzed and made available in a timely manner. (Coneglian et al., 2017, p.132, our translation).

The adoption of new technologies is fundamental in the modernization process. Digital management systems, online catalogs, and interactive platforms provide a more efficient and accessible experience for clients. Additionally, the implementation of automation technologies streamlines internal processes, allowing institutions to better meet the needs of their users.

Thus, archives, documentation centers, museums, and libraries adapt by providing customized spaces and encouraging interaction between clients and information. Managers focus on planned acquisitions to meet demands and optimize resources. Understanding informational trends is essential for adapting to changes in information mediation with clients (Valentim, 2016). Innovative management emphasizes that innovation should not be an isolated goal but a means to achieve concrete objectives, taking into account the institutional, sociocultural, technological, legal, and economic contexts of the library (Marcial, 2016).

Modernization enhances operational efficiency and positively influences the attraction of investors and readers. Investing in innovative technologies makes archives, documentation centers, museums, and libraries more appealing to those seeking dynamic and up-to-date environments. The provision of digital services, such as online lending platforms, virtual reading rooms, and interactive resources, contributes to reader retention and the attraction of new audiences.

The influence of modernization extends beyond the internal realm of archives, documentation centers, museums, and libraries, impacting the community in which they are situated. These spaces become catalysts for education, culture, and sustainable development, fostering the creation of more informed, technologically updated, and environmentally committed societies.

In this context, it is essential for the information professional to maintain a posture of continuous learning, remaining vigilant to the social, cultural, and technological transformations that permeate contemporary society (Valentim, 2019). By understanding new perspectives and informational trends, the information professional becomes an active agent in information mediation, effectively responding to the needs of diverse audiences (Valentim, 2019).

In implementing sustainable digital transformation in informational environments such as archives, documentation centers, museums, and libraries, it is advisable to adopt a comprehensive approach. Based on the readings conducted in this investigation, it is understood that among the suggested strategies, the following stand out: Digitization and Process Digitalization; Awareness; Training; Monitoring and Evaluation; Networking Participation; and Continuous Updating. These integrated actions form a foundation for the effective introduction of sustainable digital transformation, enhancing the role of these spaces in the digital era.

- **DIGITIZATION AND PROCESS DIGITALIZATION**

Digitization and digitalization of processes are essential in the transition from traditional practices to more efficient and sustainable operating environments. Digitization, specifically, refers to the conversion of physical documents to digital formats, while digitalization involves the comprehensive incorporation of digital technologies. Both processes contribute to more agile and accessible information management, promoting operational efficiency and sustainability.

By adopting digitization, institutions reduce dependence on physical resources, such as paper, and optimize the use of space, resulting in more sustainable operations. Furthermore, the rapid retrieval and sharing of information is facilitated, accelerating decision-making and improving internal communication. Reducing the consumption of physical resources aligns organizational practices with environmental concerns, generating substantial savings in the long term.

- **AWARENESS**

The awareness strategy in the digital era focuses on leveraging digital platforms as powerful tools to expand the reach and impact of campaigns on environmental issues. By using social media, websites, blogs and other online platforms, it is possible to reach a wider and more diverse audience, transcending geographic and demographic barriers. The dissemination of relevant information about sustainable practices becomes more effective, taking advantage of the ability to instantly share and go viral provided by the digital environment.

The use of digital platforms to raise awareness is not limited to just disseminating information. These tools allow the creation of interactive campaigns, such as quizzes, educational videos, polls and challenges, involving the audience in a participatory and engaging way. Online dialogue facilitates the exchange of ideas, experiences and knowledge, creating a virtual community committed to sustainable practices.

Furthermore, constant monitoring of interactions on digital platforms allows you to evaluate the impact of campaigns in real time, adapting strategies as necessary and ensuring a more efficient and targeted approach.

- **TRAINING**

Approaching capacity building at the intersection of digital transformation and sustainability is essential to creating a solid foundation of awareness and engagement. The creation of educational and training programs aims to provide knowledge and skills for both users, employees and the community in general. The main focus is to increase understanding of the importance of sustainability, highlighting practices that promote environmental preservation and the responsible use of technology.

For users, educational programs may include workshops, online tutorials and educational materials that address specific issues such as reducing the digital carbon footprint, consciously using electronic devices and promoting sustainable habits when using digital resources. In the case of employees, training can focus on sustainable practices in the digital workplace, encouraging operational efficiency and the incorporation of eco-efficient habits into daily professional life.

- **MONITORING AND EVALUATION**

The implementation of monitoring and evaluation systems is a step in the convergence between digital transformation and sustainability. These systems are designed to track and analyze the environmental impact of digital practices in any organizational context. The aim is to provide tangible data that allows for an accurate assessment of environmental performance and to identify specific areas for continuous improvement.

Environmental performance indicators can include metrics such as energy consumption, carbon emissions, digital waste management and efficiency in the use of technological resources. The implementation of real-time monitoring tools allows for dynamic analysis, enabling a quick

response to events or practices that may negatively impact the environment. Additionally, these tools can be integrated into reporting systems to provide clear and understandable information about the sustainable state of digital operations.

Identifying opportunities for continuous improvement is essential for adjusting policies, processes and technologies, aiming to minimize environmental impact and constantly improve sustainable digital practices. By establishing these systems, archives, documentation centers, museums and libraries can demonstrate an effective commitment to sustainability and contribute to the construction of a more responsible and eco-efficient digital environment.

- **NETWORK PARTICIPATION**

Network participation is an essential strategy to promote sustainable practices within the scope of digital transformation. Actively engaging in networks and initiatives focused on sustainability allows archives, documentation centers, museums and libraries to share knowledge, experiences and best practices with other institutions, expanding positive impact on the global stage.

Furthermore, collaboration in networks facilitates the exchange of information about green technologies, energy efficiency strategies and methods for reducing environmental impact. Active participation in networks also creates an enabling environment for the joint development of sustainable solutions and the promotion of common standards and guidelines. This collaboration can result in the creation of shared initiatives such as standardized environmental monitoring tools, development of sustainable educational resources, and joint awareness campaigns.

- **CONTINUING EDUCATION**

The pursuit of continuous updating is a fundamental practice for information professionals (Targino, 2000) who seek to operate effectively at the intersection of digital transformation and sustainability. Given

the rapid evolution of these dynamic fields, staying informed about the latest trends, technologies, and sustainable practices is essential to ensure relevance and efficiency in their activities.

Participating in courses, workshops, and specialized events provides valuable opportunities to acquire new knowledge, enhance technical skills, and develop a deeper understanding of the ethical and environmental implications of digital transformation. These learning experiences offer a conducive environment for idea exchange and networking, connecting professionals with experts and peers in related fields.

Continuing education strengthens the knowledge base of information professionals and equips them to implement innovative and sustainable practices in their work environment. Continuous awareness of changes in technological and environmental landscapes enables professionals to stay ahead of emerging challenges, contributing proactively to the advancement of their institutions and the creation of a more sustainable and informed future. According to Savic (2021), information managers and library staff will face significant impacts, requiring a multifaceted approach and the development of various competencies. The necessary skills include:

- Digital literacy or technical knowledge
- Full engagement
- Dealing with information and cognitive overload
- Flexibility and adaptability
- Lifelong microlearning and personal development
- Emotional intelligence and social skills
- Cultural and other diversity
- Transdisciplinary approach
- Mobile force and remote work
- Understanding of the generation gap
- High-level digital ethics

In conclusion, the implementation of sustainable digital transformation in informational environments requires a multifaceted and integrative approach. The strategies discussed form the foundation for an effective transition to more eco-efficient and innovative practices in archives, documentation centers, museums, and libraries. By coordinating these actions, these institutions align with sustainability principles and position themselves as leaders in promoting a conscious digital future committed to environmental preservation. Through these practices, informational environments strengthen their relevance in the digital age, ensuring the continuity of their educational and cultural mission while actively contributing to a more sustainable and responsible development.

INTEGRATION OF SUSTAINABLE DEVELOPMENT GOALS IN THE DIGITAL TRANSFORMATION OF INFORMATIONAL ENVIRONMENTS

The Sustainable Development Goals (SDGs) were established through a global consultation process involving governments, civil society, experts, and the private sector, aiming to create a universal set of targets addressing the most pressing challenges faced by humanity, including poverty eradication, promotion of quality education, reduction of inequalities, and climate action.

In the convergence of digital transformation and sustainability within archives, documentation centers, museums, and libraries, it is possible to enhance these efforts by integrating the Sustainable Development Goals (SDGs) established by the UN. This synergy strengthens local practices and contributes to global targets. Below are some particularly relevant SDGs that can be implemented in this context:

- SDG 4 - QUALITY EDUCATION:**

Implement digital solutions to improve the accessibility and quality of education, making educational resources more available and sustainable. In this scenario, the implementation of digital solutions emerges as a strategy to improve the accessibility and quality of education. The

digitalization of educational resources increases the availability of these materials, and promotes sustainability by reducing the need to consume physical resources, such as paper.

- **SDG 9 - INDUSTRY, INNOVATION AND INFRASTRUCTURE:**

Adopt innovative technologies to improve operational efficiency, including the digitization of collections and the implementation of effective information systems. The implementation of effective information systems contributes to more efficient management of resources, facilitating the management of data, loans, reserves and other services, promoting innovation

- **SDG 11 - SUSTAINABLE CITIES AND COMMUNITIES:**

Promote digital and virtual platforms to guarantee access to information in diverse communities, reducing the need for physical travel and contributing to urban sustainability. This transformation increases accessibility to information and reduces the environmental impact associated with transport.

- **SDG 12 - RESPONSIBLE CONSUMPTION AND PRODUCTION:**

Adopt sustainable digital resource management practices, reducing consumption of paper, energy and other physical resources, while promoting a more conscious approach. By adopting innovative technologies and digital strategies, archives, documentation centers, museums and libraries can minimize dependence on physical materials such as paper and reduce energy consumption associated with traditional processes.

The relationship between users and bibliographic materials in libraries often reflects a lack of understanding about the management of these resources. Many users may not be aware of how to handle materials that are not of interest to them, mistakenly assuming that libraries store

all types of materials indefinitely. Given this scenario, it is important to promote greater awareness about the proper disposal of these materials.

Clients often turn to libraries for advice on how to properly discard or recycle unwanted bibliographic materials. To meet this demand and promote sustainable practices, it is beneficial for libraries to establish partnerships with recycling companies. In this way, they contribute to the correct disposal of these materials and strengthen their environmental responsibility. These partnerships provide an efficient solution for proper disposal, aligning with sustainability principles and promoting a conscious approach to bibliographic resources.

- **SDG 13 - CLIMATE ACTION:**

Implement measures to reduce the carbon footprint of library operations, such as energy efficiency in digital systems and promoting eco-efficient initiatives. Energy efficiency in digital systems, for example, involves using technological resources in an optimized way, reducing unnecessary energy consumption. Furthermore, the promotion of sustainable initiatives in the digital sphere, such as the use of efficient servers and the choice of eco-conscious platforms, are strategies that contribute to action against global climate change.

- **SDG 17 - PARTNERSHIPS FOR THE GOALS:**

Establish collaborative partnerships between archives, documentation centers, museums and libraries, educational institutions and companies to promote sustainable practices and share digital resources. This collaborative approach allows for the exchange of knowledge, experiences and best practices in the field of digital sustainability. These partnerships are essential to achieving the objectives of digital sustainability, benefiting society as a whole.

Furthermore, the constant evolution of social demands requires in-depth reflection on the need to update curricula. The adaptation of academic programs must be directed to meet emerging needs, aiming to

train librarian professionals who are conscious, critical and prepared to face the ongoing transformations.

Introducing these innovations into curricula, although essential, presents significant challenges. It is necessary to address ethical issues, with privacy and equitable access to information as pressing priorities. In this context, ensuring a responsible transition guided by solid ethical principles and respect for individual rights is essential.

Additionally, it is essential to continue in-depth academic studies that cover the themes of digital transformation and sustainability. This practice will contribute to consolidating existing knowledge and devising and implementing new innovative initiatives.

Thus, the implementation of sustainable digital transformation in informational environments proves to be a multifaceted and integral journey. These actions enhance operational efficiency and amplify the role played by archives, documentation centers, museums, and libraries in the digital age.

The selection of Sustainable Development Goals (SDGs) addressed in this section is based on their specific relevance to the digital transformation of informational environments such as archives, documentation centers, museums, and libraries. For instance, SDG 4 stands out for promoting quality education, which can be significantly enhanced through the digitization and increased accessibility of educational resources. SDG 9 emphasizes innovation and infrastructure, which are essential for implementing technologies that improve operational efficiency and facilitate the management of digital collections. SDG 11 addresses urban sustainability, where access to information via digital platforms can reduce the need for physical travel, thus contributing to more sustainable cities.

Additionally, SDG 12, focusing on responsible consumption and production, is directly applicable to the sustainable management of digital resources, reducing paper and energy use. SDG 13, which deals with climate action, is relevant for implementing measures that lower the carbon footprint of digital operations. Finally, SDG 17 underscores the importance of partnerships and means of implementation, essential for sharing digital

resources and sustainable practices among institutions. Integrating these SDGs provides a strategic approach to align global sustainability goals with local digital transformation practices, thereby strengthening the impact of these informational environments in contemporary society.

The convergence between digital transformation and sustainability presents a unique opportunity for information professionals to play a significant role in promoting sustainable practices. Digital transformation, characterized by the adoption of advanced technologies and the digitization of processes, can be leveraged to effectively achieve sustainability goals.

Firstly, information professionals can use digital transformation to ensure access to relevant and up-to-date information on sustainable practices. By developing and managing robust and accessible information systems, they can facilitate the dissemination of knowledge that encourages the adoption of practices contributing to environmental preservation. Moreover, the digitization of documents and processes helps reduce the use of paper and other physical resources, directly contributing to sustainability.

In second place, the conscious use of digital technologies is essential for minimizing the environmental impact of digital activities. Information professionals can raise awareness about the importance of energy efficiency in data centers and the use of electronic devices, as well as about the proper management of the technology lifecycle, including responsible disposal and recycling.

Moreover, these professionals have the opportunity to lead initiatives that integrate sustainability into information governance processes. This includes developing digital preservation policies that ensure continuous access to information while also considering the environmental impact of data storage and processing practices.

Therefore, by exploring the intersection between digital transformation and sustainability, information professionals can ensure access to information and promote the conscious use of digital technologies, contributing to environmental preservation and sustainable development.

CONCLUSIONS

The integration of advanced technologies improves operational efficiency and contributes to global sustainability. It is essential that the global community adopts sustainable and digital transformation measures to optimize time and human resources, enabling more efficient conduct of daily activities. Information professionals often face an intense workload, struggling to keep up with daily tasks while dealing with increasing demands.

In this context, digital transformation appears as a promising solution by offering the automation of activities, allowing information professionals to focus on more strategic tasks. This technological evolution alleviates work overload and expands service capacity, enabling librarians to reach a greater number of users in different parts of the world.

The automation provided by digital transformation is not limited to optimizing time, but also opens doors to global accessibility. Archives, documentation centers, museums and libraries, through digitization, become available to people anywhere on the planet. This democratization of access to information is one of the outstanding benefits of the digital revolution in the field of information, promoting a wider dissemination of knowledge. In addition to optimizing processes, sustainable practices have the power to unite readers in a common cause of citizenship and environmental awareness.

Just as in other fields, information professionals must stay updated and continuously enhance their skills. Digital transformation requires ongoing training to ensure these professionals are equipped to handle emerging demands and digital innovations, guaranteeing that they can provide relevant and efficient services in an increasingly technological and globalized environment.

The convergence of digital transformation and sustainability significantly redefines the role of information professionals, promoting a more efficient and environmentally conscious approach. Digital transformation enables the automation of daily tasks, freeing up time for more strategic activities and providing greater reach for services. Integrating sustainable practices into the operations of archives, documentation centers,

museums, and libraries, aligned with the UN's Sustainable Development Goals (SDGs), reinforces the commitment to environmental responsibility.

The implementation of innovative technologies, awareness of sustainable practices, and the formation of collaborative partnerships are key elements in this convergence. The adoption of effective digital solutions, the promotion of quality education through accessible and sustainable resources, and the reduction of physical resource consumption contribute to achieving various SDGs. This integration optimizes operational efficiency and positions information professionals as change agents, leading initiatives that address current societal demands in an innovative and sustainable manner.

It is essential to consider digital inequalities when promoting sustainable practices, ensuring that digital transformation is inclusive and accessible to all segments of society. With a critical and engaged perspective, information professionals can make significant contributions to a more sustainable future, where digital technology acts as an ally in balancing development and environmental preservation.

Additionally, the continuation of academic research involving digital transformation and sustainability is essential for fostering new initiatives. Ongoing engagement in academic research in these domains is essential for developing a more comprehensive understanding of the challenges and opportunities, enabling society to advance in an informed and sustainable manner in the convergence of these fields.

Therefore, the convergence of digital transformation and sustainability redefines practices and operations in archives, documentation centers, museums, and libraries, strengthening the role of information professionals as essential facilitators in this dynamic landscape. By adopting innovative technologies, promoting sustainable practices, and establishing strategic partnerships, these professionals are aligned with current demands and leading the way toward a more efficient, accessible, and eco-conscious future. This integrated approach drives the evolution of informational environments in the digital age and significantly contributes to building more informed, educated, and sustainable societies.

REFERENCES

Comissão Mundial Sobre Meio Ambiente e Desenvolvimento. (1988). *Nosso futuro comum*. Fundação Getúlio Vargas.

Conegiani, C. S., Gonçalez, P. R. V. A., & Segundo, J. E. S. (2017). O profissional da informação na era do big data. *Encontros Bibli: Revista eletrônica de biblioteconomia e ciência da informação*, 22(50), 128-143.

Geraldo, G., & Pinto, M. D. de S. (2019). Percursos da Ciência da Informação e os objetivos do desenvolvimento sustentável da agenda 2030/ONU. *Revista ACB*, 24(2), 373–389. <https://revista.acb.org.br/racb/article/view/1597>

Inácio, B. R., Rolim, R. B., & Serralvo, F. A. (2022). O papel da cultura organizacional na transformação digital. *Revista Administração em Dílogo*, 24(2), 1-7.

Marcial, V. F. (2016). Inovação em bibliotecas. In A. C. M. Ribeiro, P. C. G. Ferreira (Org.), *Biblioteca do século XXI: Desafios e perspectivas* (pp. 43–59). Ipea.

Nações Unidas no Brasil. (2015). *Transformando nosso mundo: A Agenda 2030 para o desenvolvimento sustentável*. ONU Brasil. <https://brasil.un.org/sites/default/files/2020-09/agenda2030-pt-br.pdf>.

Savić, D. (2021, May 11). Impact of digital transformation on the future of library work. *Preuzeto*, 6. <https://www.institutefordigitaltransformation.org/impact-of-digital-transformation-on-the-future-of-library-work/>.

Sawaya, M. R. (1999). *Dicionário de informática e internet: Inglês-português*. NBL Editora.

Sebastian, I. M., Ross, J. W., Beath, C., Mocker, M., Moloney, K. G., & Fonstad, N. O. (2020). How big old companies navigate digital transformation. In R. D. Galliers, D. E. Leidner, B. Simeonova (Ed.), *Strategic information management: Theory and practice* (5th, pp. 133-150). Routledge.

Souto, L. F., & Pizzol, R. A. (2019). Sustentabilidade e gestão do conhecimento. *RDBCi: Revista digital de Biblioteconomia e Ciência da Informação*, 17, e019020. <https://doi.org/10.20396/rdbc.v17i0.8653433>

Targino, M. D. G. (2000). Quem é o profissional da informação? *Transinformação*, 12, 61-69.

Valentim, M. L. P. (2004). Equipes multidisciplinares na gestão da informação e conhecimento. In S. G. Baptista, & S. P. M. Muller (Org.), *Profissional da informação: O espaço de trabalho*. (pp. 154–176). Thesaurus.

Valentim, M. L. P. (2016). O perfil das bibliotecas contemporâneas. In A. C. M. L. Ribeiro, & P. C. G. Ferreira (Org.), *Biblioteca do século XXI: Desafios e perspectivas* (pp. 19–42). Ipea.

Valentim, M. L. P. (2019). Competências essenciais para a formação e a atuação do bibliotecário. *Revista Eletrônica da ABDF*, 3(2), 46-63.

Verhoef, P. C., Broekhuizen, T. L., Bart, Y., Bhattacharya, A., Qi Dong, J., Fabian, N. E., & Haenlein, M. (2021). Digital transformation: A multidisciplinary reflection and research agenda. *Journal of Business Research*, 122, 889–901. <https://doi.org/10.1016/j.jbusres.2019.09.022>.

Part II

**Digital transformation and
sustainability**

Information tools – integration into the librarian profession

*Elena Popova*¹

*Sabina Eftimova*²

ABSTRACT: The improvement of Information Technology (IT) in the last two decades has led to many changes in Library and Information Sciences. The librarian profession has been challenged in many areas. In relation to these changes, a new type of source has recently been discovered – information tools. There is a wide variety of tools used in IT that serve different purposes, depending on the specific area of IT. They are usually associated to the business needs, but libraries can also benefit from them. The aim of this paper is to present two information tools, designed to support librarians and the achievement of the United Nations (UN) Sustainable Development Goals – the International Federation of Library Associations and Institutions (IFLA) Library Map of the World and the European Bureau of Library, Information and Documentation Associations (EBLIDA) Matrix. Each of them has a specific purpose and needs to be popularised among librarians and guided in its use in order to be effective. As part of PhD study 'Libraries and future information ecosystem', an online survey was conducted among Bulgarian librarians. Thanks to the survey results, the paper explores some ways how these tools can be integrated into the work of Bulgarian librarians, so that they can be effectively involved in the achievement of the UN Sustainable Development Goals.

KEYWORDS: Sustainable Development Goals, information tools, librarians, Bulgaria, IFLA Map of the World, EBLIDA Matrix

¹ University of Library Studies and Information Technologies, Sofia, Bulgaria.
E-mail: elena_b_popova@abv.bg | ORCID iD: <https://orcid.org/0000-0002-8550-5475>

² University of Library Studies and Information Technologies, Sofia, Bulgaria.
E-mail: s.eftimova@unibit.bg | ORCID iD: <https://orcid.org/0000-0002-6033-7663>

INTRODUCTION

The Internet and new technologies for communication and exchange of information create a prerequisite for achieving good results in the field of library services. This is possible through the timely exchange of experience and sharing of good practices from libraries around the world. The need for physical isolation as a result of the spread of COVID-19 led to changes in the conduct of a number of events, which were transferred to the online space. Thus, many forums, round tables, discussions, conferences, etc. started to be held in a hybrid mode or completely online, which contributes to the possibility of more and more interested people participating. Also, this way the information reaches more people. Online meeting platforms (Zoom, Microsoft Teams, Webex, etc.) offer multiple possibilities - for recording, for feedback, for access from any device, anywhere in the world, at any time.

It is extremely important that Bulgarian librarians actively participate in this modern method of communication with their colleagues around the world. In this way, large-scale projects can be carried out in partnership easily, affordably and with the possibility of low-budget participation. This paper emphasizes another aspect of the benefits of this dynamically changing environment – the opportunities for free use of tools developed for the benefit of libraries by international organizations. These new ways of communication also facilitate the ability to collect information, which specialists from the International Federation of Library Associations and Institutions (IFLA) and the European Bureau of Library, Information and Documentation Associations (EBLIDA) analyse and make available to libraries worldwide.

METHODOLOGY

The research was conducted by analyzing information from the official web pages of the tools - IFLA's "Library Map of the World" and EBLIDA's "Matrix" and other documents related to the benefits of integrating them into the work of Bulgarian librarians.

Analysis has been carried out between June-September 2023 as a follow up on the research work done for the PhD study 'Libraries and future information ecosystem' (2019-2022) and as part of project titled, "Study of Attitudes to the Therapeutic Potential of Reading in Atypical Situations for the Individual". The empirical part of the PhD study led to the conclusion that Bulgarian librarians are very poorly informed about the opportunities they have for communication and participation in different activities on international level. This conclusion inspired a deeper view on these two information tools, which appeared in the PhD study as examples of innovative and useful for the librarians.

The paper is presenting the two information tools – what is available on their websites, how they gather their information, who can use it and why for. Also, the research is interested in their relation to the achievement of the 17 UN SDGs.

There are several studies led by Bulgarian LIS scientists such as T. Todorova (2014a,b), L. Parizhková (2014), I. Peteva (2015), O. Harizanova (2010), etc. which are related to the problems Bulgarian librarians face with their integration to the international librarian community. These studies have been considered during the current research to show the necessity of different approaches for informing and involving the Bulgarian libraries to the modern international communication.

RESULTS

Libraries actively use their collections, educational programs, exhibitions and collaborative projects with citizens to give visibility and information about the 17 UN Sustainable Development Goals. The good news is that many libraries - often without realizing it and without naming it explicitly - are already working towards the Sustainable Development Goals.

To make the efforts of Bulgarian librarians more effective, it is recommended to become familiar with and use good practices from libraries around the world. The tools presented in the paper are extremely

significant precisely in the direction of raising awareness. They provide an opportunity to better understand the importance of libraries in achieving the SDGs and to provide specific guidance for each library.

LIBRARY MAP OF THE WORLD

The World Library Map (see Fig. 1.) is a valuable tool developed by the International Federation of Library Associations and Institutions (IFLA) designed to collect evidence and demonstrate the importance and value of libraries around the world. The map allows access to different types of information: how many libraries a country has; how many of them offer internet access; how many registered library users there are in the country and how many visits are made; number of borrowed library materials per year, etc. The information available from the Library Map is a clear way of demonstrating how well libraries are being used, and quantitative data can be interpreted in reports, petitions and presentations. In addition, there is much qualitative evidence showing how libraries around the world are supporting the SDGs.

Fig. 1: IFLA (2017).



Libraries are leading organizers and providers of free access to all types of information for all citizens. To show the potential of the global library community, the World Library Map includes all types of libraries, including national, academic, community, school and special. The initial

set of performance indicators includes number of libraries; libraries providing access to the Internet; employees and volunteers; registered users and visitors; number of borrowings.

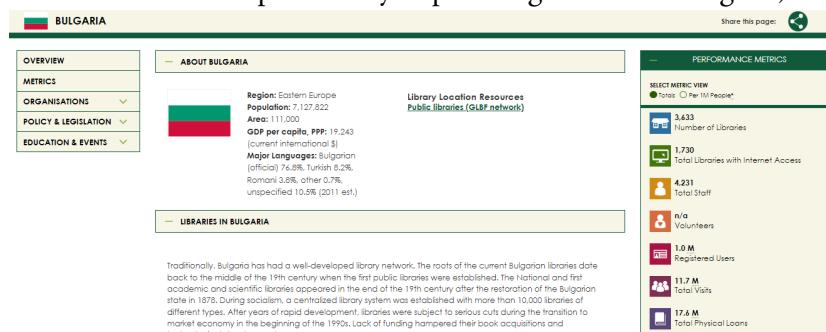
As an advocacy tool, the Library World Map is also a platform providing access to SDG stories, demonstrating how libraries in different countries contribute to the UN's Sustainable Development Goals and serve as partners in meeting local development needs (Library 2017).

Data is collected through an annual survey conducted between April and the end of October. IFLA selects a partner for this purpose - a national library association, national library or other institution in any country in the world to link and collect aggregated data at national level. The survey questionnaire is available on the Library Card website in three languages.

The webpage of the Map can be accessed in seven languages – Arabic, Chinese, English, French, German, Russian, Spanish.

The tool offers different types of selections – one of them is by country – for the purposes of the research Bulgaria was targeted (Fig. 2.) The tool provides brief information about the library network of the country and performance metrics, which are showing different categories due to the data provided from the survey.

Fig. 2: Library Map of the World – About Bulgaria (Resource accessed 23.06.2023: <https://librarymap.ifla.org/countries/Bulgaria>)



EBLIDA MATRIX

On the website of the European Bureau of Library, Information and Documentation Associations (EBLIDA) the so-called Matrix of EBLIDA (see Fig. 3.). It provides information at the service of European libraries - how they can get involved in the implementation of the UN's 2030 Agenda for Sustainable Development. This Matrix provides information on each of the Sustainable Development Goals in the following areas:

- Selection of EU programs that are suitable for libraries;
- Library policy;
- Possibilities for financing the library;
- Main indicators;
- Library Indicators.

Fig. 3: EBLIDA Matrix (2023).



The EBLIDA matrix works by considering that the mission of libraries is not only related to the collections stored in their buildings and on their servers. Libraries must respond to the needs expressed by

the communities with which they interact. They must work within a framework in which economic, social and cultural objectives are aligned and united in a clear and definitive direction. This framework is the UN's Sustainable Development Goals initiative, which was adopted by all UN member states in 2015, and is a common blueprint for peace and prosperity, now and into the future.

If, for example, a library operates in a context where there is a high level of pollution and/or a political commitment to eliminate plastics. Its task is not to set pollution control policies in motion - there are specialized departments and research centers responsible for this. But libraries can disseminate information and create awareness among users about the problem and possible solutions. They can initiate or collaborate on citizen science projects and be examples of a Green Library themselves.

A sustainable society is above all a matter of lifestyle. Therefore, libraries, which claim to be places of meeting and socializing, can be instrumental in turning malpractice into virtuous behavior.

According to the EBLIDA page, the information in the Matrix is updated on an annual basis. In this way, librarians and professionals can use it as a compass: to shape national, regional library policies in relation to SDGs perspectives; as a banner: to raise the profile of the library, projects to be submitted to European Structural and Investment Funds (ESIF); as a calculator: to assess to what extent libraries' performance corresponds to Eurostat's sustainability indicators (EBLIDA Matrix, 2023).

ANALYSIS AND RECOMMENDATIONS

As part of PhD study titled "Libraries and future information ecosystem" an online survey was conducted among Bulgarian librarians. The nature of the empirical research on the topic "Library specialists in Bulgaria and the changing information ecosystem" implies the use of a method of direct communication with the respondent group of Bulgarian library specialists as its object. The survey aims to investigate the level of awareness of the Sustainable Development Goals and the changing global

information environment among professionals working in Bulgarian libraries. The aim is to identify gaps in awareness and define the needs of professionals for better ways to access information about new trends in the changing information ecosystem and the opportunities for information professionals and users to contribute to the achievement of sustainable development goals. The target group of this study are librarians from public and university libraries in the country. The survey card contains 22 questions and is distributed to respondents via Google Forms between February 5 and March 30, 2022. The questions are accompanied by suggested possible answers. 18 questions are mandatory, but all have the option of a neutral answer. There is an opportunity to mark more than one answer for six questions, and only the last one has a free answer and is optional. The preparation and drafting of the questions were done in accordance with the objectives of the study and the specifics of the targeted group. The survey is completed anonymously, respondents have the option to enter the institution they work in as an answer to the last question. The survey card was sent directly to about 500 email addresses and spread through specialized groups in social networks. Respondents were invited to complete the form three times within this period. The result achieved before the survey was closed is 200 complete responses. According to information from the Bulgarian Statistical Institute from 2019, the total number of people working in the libraries in Bulgaria was around 1200, so the respondent's percentage can be considered reliable.

The data has been processed using typical statistical methods and presented using diagrams. The results of the survey are presented separately for each question and analysis was done based on them and on the theoretical chapters of the PhD study research.

In summary, the research establishes an unsatisfactory level of awareness regarding the new trends in the library and information sector described in the IFLA Trend Reports (2013, 2018, 2019, 2021) on the main guidelines for the development of the information society and the relationship of libraries to the UN SDGs. This reflects on the ability of Bulgarian library and information specialists to effectively apply modern methods in serving user needs, as well as to implement long-term changes

in the direction of modernizing the library institution. The survey results showed a low level of awareness of the professionals in relation to these instruments and the institutions behind them. This statistic led to exploration of different ways of how these types of tools and the information from the international institutions and organization can be integrated more effectively into the Bulgarian libraries. Here are some of the observations:

- Stimulation for participation in different international discussions, forums, projects etc., so the professionals can share ideas and see how the libraries work on the achievement of SDGs in other countries;
- Websites contend translation to Bulgarian or language courses for the library employees;
- Building a platform for library professionals titled “Libraries and future information ecosystem”, which collects multiple data from different sources (national – ministry websites, governmental documents, Bulgarian library association etc., and international – organizations, federations, associations such as IFLA, EBLIDA, Liber, also European council, different university library websites etc.) and providing field for the Bulgarian librarians to share information, discuss different topics and ask questions.

CONCLUSIONS

According to T. Todorova, the rediscovery of the importance of libraries and librarians in modern times is through the quality performance of their key function - of active partners in professional guidance, training and personal development in a networked environment with the three main pillars - access, retrieval and evaluation of information. For the implementation of the new concept of the library, the role of information is leading, considering the diversity of information carriers and the virtual nature of a large part of the information flow, created and exchanged in the conditions of the modern information ecosystem (Todorova, 2014a).

It is extremely important that Bulgarian librarians show professional curiosity and take active advantage of the created and working international tools for librarianship. Such are the “Library Map of the World” maintained by IFLA and the EBLIDA “Matrix” discussed in the present work. Their integration into the work of Bulgarian library institutions would lead to a few new ideas and potential improvements in the sector.

ACKNOWLEDGEMENTS

This research is part of the following project: “Study of Attitudes to the Therapeutic Potential of Reading in Atypical Situations for the Individual” financed by the National Science Fund of the Ministry of Education and Science of the Republic of Bulgaria with Contract № КП-06-Н45/2 from 30.11.2020, led by Chief Assist. Prof. S. Eftimova-Ilieva, PhD.

REFERENCES

European Bureau of Library, Information and Documentation Associations Matrix. (2023). *Official website*. <http://www.eblida.org/activities>

Harizanova, O. (2010). *Bibliotekite I mrezhovoto obshtestvo: Efekti I transformatsii*. Universitetsko Izdatelstvo ‘Sv. Kliment Ohridski’.

International Federation of Library Associations and Institutions. (2018). *IFLA Trend report update 2018*. <https://www.ifla.org/node/67015>

International Federation of Library Associations and Institutions. (2019). *IFLA Trend report 2019 update*. <https://trends.ifla.org/update-2019>

International Federation of Library Associations and Institutions. (2021). *IFLA Trend report 2021 update*. <https://www.ifla.org/news/ifla-trend-report-2021-update-released/>

International Federation of Library Associations and Institutions. (2017). *Library map of the world*. <https://librarymap.ifla.org/about>

International Federation of Library Associations and Institutions. (2013). *Insights from IFLA Trend report: Riding the waves or caught in the tide?* <https://repository.ifla.org/handle/20.500.14598/3220>

International Federation of Library Associations and Institutions. (n.d.). *Library Map of the World – About Bulgaria*. IFLA. <https://librarymap.ifla.org/countries/Bulgaria>

European Bureau of Library, Information and Documentation Associations. (2019). *Implementing sustainable development goals in european libraries*. <https://eblida.org/activity/libraries-un-sdgs-matrix/>

Parizhkova, L. (2014). *Novi formi na organizatsia na znanieto*. Za Bukvite.

Peteva, I., & Pavlova, D. (2015). *Digital Britain 2: Putting users at the heart of government's digital service*. National Audit Office.

Todorova, T. (2014a). *Integratsionni protsesi v bibliotechno-informatsionnata sfera*. Za Bukvite.

Todorova, T. (2014b). *Razrabotvane I upravlenie na proekti v bibliotechno-informatsionnia sektor*. Za Bukvite.

Sustainable Development of Library Institutions through Digital Transformations

*Ivana Nikolova*¹

*Elisaveta Tsvetkova*²

ABSTRACT: We live in a society where information technologies are used in all areas of human life, including the recording, storage and distribution of information. Modern consumers are constantly hungry for information, but prefer to receive it in electronic format. In this environment, libraries must adapt to adequately respond to current user demands. The most logical step to ensure sustainability of libraries in the modern information environment is precisely their digital transformation by including digital resources and services. The main objective of the research presented in this paper is to present and analyze the digital transformation of library institutions from the point of view of changes in the modern information environment and the wide advent of new information and communication technologies. As a specific example of digital transformation, the Digital Library at the Library and Information Center of the University of Library Studies and Information Technologies – Sofia, Bulgaria is presented. The methodology applied to carry out the research includes the tools of content analysis and synthesis, monitoring and comparison of traditional and electronic sources of information and good practices. In summary, this paper aims to highlight the key importance of the active inclusion of modern information and communication technologies in libraries today and to demonstrate that digital transformation is a key element of the sustainability of any modern library.

KEYWORDS: Digital libraries, Mobile digital libraries, Bulgaria, Library and information services, Digital transformation.

¹ University of Library Studies and Information Technologies, Sofia, Bulgaria.
E-mail: i.nikolova@unibit.bg | ORCID iD <https://orcid.org/0009-0009-0383-1022>

² University of Library Studies and Information Technologies, Sofia, Bulgaria.
E-mail: e.cvetkova@unibit.bg | ORCID iD <https://orcid.org/0000-0002-5966-7761>

INTRODUCTION

In the context of the digital transformation of education, the importance of forming an electronic library is justified, taking into account the fields of study, research topics and other searches of all target groups of the educational institution. The active use of Internet sources by students and teachers sets the task of popularizing and disclosing electronic collections and organizing trouble-free access to valuable, reliable information from legitimate sources. Introducing the practice of constant use of verified content by students, teachers and scientists has become the main task of the library. In this regard, the principles and methods used in libraries are investigated for collecting and disseminating information, organizing events, applying academic norms and new forms of work for using information resources in the educational process and research activity.

LIBRARIES IN THE MODERN INFORMATION ENVIRONMENT

Libraries are some of the most widespread and popular cultural and informational institutions in Europe. They have centuries-old traditions in providing quality and universally accessible information, and have won the broad support and trust of society. In their millennial history, libraries have gone through various transformations influenced by socio-political, economic and cultural factors, but they have always been some of the most important public institutions preserving the written memory of the world. Today, libraries are the place that provides all the necessary opportunities for the full development of both the individual and the society as a whole.

But the efficient and quality provision of information requires modernization of the processes for collecting, processing and providing information resources and a developed technological infrastructure. Modern information and communication technologies provide limitless opportunities precisely for the introduction of innovative library activities and services, for the initiation of up-to-date and user-requested policies that will further increase the social status and role of library institutions. Libraries are some of the oldest scientific, educational and cultural

institutes. For the long period of their existence, their social functions have undergone significant changes, influenced by the historical development of society. The purpose of the first libraries was to store documents. From the moment of their emergence until today, libraries have gone through the first stage of the evolution of the public mission: from serving the needs of the ruling elite to meeting public, scientific, educational and cultural needs. The library has become a social institution, including scientific-informational and cultural components, ensuring the sustainability of connections and relations within the framework of the new information society and the knowledge society.

The major principles of the information society are:

- increasing the role of state authorities in promoting the use of information and communication technologies for social development;
- development of information and communication infrastructure and a favorable environment for applications of information and communication technologies, primarily in the scientific and educational sphere;
- ensuring scientific, cultural and linguistic diversity and development of the regional component;
- building information and intellectual potential, including by organizing access to education and information;
- strengthening and expanding international and regional cooperation in the field of information technologies;

The peculiarity of the modern age lies in the fact that it is the arena of two revolutions at once – mental and technological. The first one is related to the process of globalization and the formation of a new cultural paradigm, and the second is to the consequences of technological breakthroughs in the field of communications.

Libraries, both traditional and electronic, especially electronic, occupy a certain place in the communication system – social, scientific, cultural. It is through libraries that scientific communication takes place above all. Although the development of computer technologies and telecommunications has changed the basic communication model of society, the social need for the functions of libraries as an element of the scientific communication system remains. According to statistics, over 70% of scientists use libraries (mainly academic, scientific, and university) as a source of information. However, updating traditional library collections does not fully meet the needs of modern users-researchers for a complex of intractable reasons. But still, a large and significant part of scientific electronic document circulation inevitably passes through libraries.

CHANGES IN THE DEMANDS OF MODERN LIBRARY USERS AND THE RESPONSE OF LIBRARIES

The young generation is the most interesting group of society in terms of education, knowledge and answers to interesting questions. A significant number of young people choose universities, institutes, science and business schools to obtain a higher educational status. Given their age, we can confidently say that they have come into this world with a well-developed network space with technologically new forms and opportunities for distributing and receiving information. The popular belief that all the information needed for education and research is available on the Internet is controversial, as quantity is no guarantee of quality, reliability, and relevance. Information must be checked through a “sieve of professional expertise” and younger users lack the critical and analytical skills to evaluate the information they find on the Internet (Anuradha, 2018 p.810). Academic libraries existing in university structures are able to solve this problem in the conditions of an abundance of information, not only shortening the path to the necessary and valuable content, but also creating an atmosphere of cooperation with students, teachers, scholars to achieve academic and research goals (Gerasimenko, 2019). But in order to solve this problem, new approaches are needed for the formation

of collections, strengthening the work of university libraries for their disclosure and introducing modern communication channels with users.

Bibliographic information on traditional printed publications (for example, textbooks, monographs, etc.) sought by students and teachers is reflected in catalogs (printed or electronic, sometimes in more complex information systems). With the emergence of a large number of supporters of electronic content, the need to solve the problem of unification and disclosure to users of traditional collections, separate electronic publications, own and external network resources, that is, the use of specialized technologies and services, has become obvious. Despite the active development of university and scientific libraries for the scientific and educational community, there remains an acute question about the preferences of users of search engines without taking into account the degree of trust in the information received. (Kozyreva, et al., 2021). To solve these problems, libraries take the following actions:

- actively promote the use of network resources with verified content, forming collections of the most valuable open access sources, making an expert selection of materials;
- use services for full-text search of documents from the collection (an approach similar to search engines);
- introduce a culture of working with information, organizing courses, master classes, and lectures for various target groups of the organization;
- reveal the advantages of working with information resources through tools and additional platform services.

New methods of information handling not only save time but also provide a substantial amount of information on the desired query. The process of gathering information from sources such as periodicals has undergone significant changes, which are most evident in the article format of publications such as magazines, newspapers, and other sources. The use of print publications or their electronic counterparts as a means of reviewing material on a topic is no longer considered appropriate for

serious research. With the advent of electronic information resources, it is now possible to conduct searches beyond the scope of a single journal, thematic collection, or yearbook. Aggregator platforms have been specially designed to accumulate information and conduct searches from sources of different publishers, organizations, and countries, as well as from interdisciplinary documents. Some publications may be challenging to locate if the user only searches for the periodical's name. The number of publications produced at the intersection of various scientific fields is already substantial, and it is expected to increase. This underscores the importance of attracting individuals interested in information to academic libraries. The use of new methods and tools to attract attention to professional information resources, services and communication is the task of libraries (Al Dwairi KMO, 2019; Gavrilova, 2021). Libraries are no longer the sole provider of information and are forced to compete for customers with the Internet, online stores and social networks, and to meet the challenge of raising awareness of their values and capabilities, which requires marketing solutions to build strong relationships with users through planning, implementation and continuous monitoring of activities (Golubeva, 2020; Lapo, 2021).

RESEARCH OBJECTIVES AND METHODOLOGY

The main goal of the research presented in this paper is to present and analyze the digital transformation of library institutions in view of the changes in the modern information environment and the widespread of new information and communication technologies. As a concrete example of digital transformation, the Digital Library at the Library and Information Center of the University of Library Studies and Information Technologies in Sofia, Bulgaria, is presented.

The methodology used to conduct the research includes tools for analysing and synthesising content, and observing and comparing traditional and electronic information sources. The object of the study is the digital libraries created by the library and information institutions in Bulgaria. As a good example, the Digital Library of the Library and

Information Centre of the University of Library Studies and Information Technologies (ULSIT) is presented and analysed in detail. The methods of observation, comparison and content analysis of the information on the state of digitization in the library sphere allowed to summarize the experience and to identify the main problems and advantages of the period of active use of information and communication technologies in the library system in Bulgaria. The library, as a traditional structure, is responsible for the collection, preservation and dissemination of knowledge presented through various media. Nowadays, the most appropriate way of disseminating information is through modern digital and mobile technologies. The latest ways of information transfer allow libraries to reach a variety of contacts and to create new forms of communication with the readers, i.e. to organise work on a new level: at any time of the day and outside the library premises (Lotova, 2017).

DIGITAL LIBRARY AND INFORMATION PROVISION IN BULGARIAN LIBRARIES

Today, as we have witnessed extremely rapid developments in technology, especially in the last two decades, information centres are once again readjusting their policies and taking into account the impact of various external factors and influences. The emergence of new information channels, new information media, changing information and knowledge flows, changed user attitudes - the desire for instant access to resources here and now - are at the heart of the need for library institutions to adapt and seek new models to respond to contemporary conditions and needs.

In spite of some negative facts and trends, such as insufficient care on the part of the government, the lack of adequate regulations in some respects and a persistent financial shortage, there has been some progress in the development of the library and information sector in Bulgaria in recent years. As a result of the active stance of the Library College, the efforts of individual libraries and representatives of the library profession, our information centres have begun to introduce modern European standards into their activities and are increasingly seeking their new place

and role in the social and educational environment. Digital and even mobile digital libraries have already been established in many of our larger libraries. Many library centres are equipped with modern equipment and software for digitisation, collection preservation and automation of library processes. Library managers are aware of the important role of European projects and make effective use of the opportunities they offer to the institutions they manage. The importance and role of library education and of well-trained and motivated information professionals is also recognized. Existing university programs are being optimized and there is an increasing emphasis on student and staff mobility and on learning about good library practices and professional experience abroad. At the same time, the need for lifelong learning to continuously improve and develop the skills and knowledge of library professionals is being recognised (Tsvetkova, 2022).

Undoubtedly, one of the positive directions in the development of the library and information system of our country is the creation of digital library collections accessible in electronic form, including through the latest forms of information and communication technologies, namely mobile phones and tablets. Any digital library can be used through mobile devices and is considered mobile in this type of access. Digital libraries meet the needs of modern users for quick and easy access to a wide range of information. It is also a way of promoting national cultural heritage beyond national borders, across the globe, using 21st-century technology.

THE DIGITAL LIBRARY OF IVAN VAZOV NATIONAL LIBRARY, PLOVDIV

The Ivan Vazov National Library's Digital Library was launched on July 4, 2017. Currently, all nine collections are available to users, with digital content being continuously added. The digital platform offers several advantages:

- is intended to appeal to the widest possible range of users;
- the interface is clean, modern and user-friendly;
- special preview mode for mobile devices;

- a possibility of an integrated search for cultural objects by all the participating institutions;
- by creating different types of accounts, including user accounts and multi-level administrator accounts, the system provides different levels of access;
- a possibility of forming personal user virtual collections representing lists of selected objects;
- bilingual interface - Bulgarian and English
- the administrative part of the system is flexible, convenient and requires no special computer skills, offering a wide range of features including the ability to export lists and track employee actions within the system, etc.;
- playback of different file types is supported, including images, 3D models, virtual video tours, videos, and audio.

The Digital Library of the Ivan Vazov National Library, Plovdiv, offers modern services and possibilities in accordance with the world standards of library services, promotes the national cultural heritage preserved there worldwide and provides convenient and permanent access to users.

SOFIA LIBRARY AND ITS DIGITAL RESOURCES

The Serdika Digital Platform is a free online resource that provides a large range of users with access to various materials, including full texts of books, journals and articles, digital copies of paintings and audio recordings from the Sofia Library Collection. In addition, users are able to explore documentary exhibitions and collections of different documents on specific topics. The platform also includes postcards, photographs, films and documents related to the history and development of the city of Sofia, its schools, community centres and cultural institutions.

‘Digitization of Cultural Heritage - an Accessible Portal to Historical Memory’ Project is being implemented as part of the Cultural Heritage and Contemporary Arts Program. Its objective is to establish four digitization

centres to document Bulgaria's cultural history. The project aims to increase institutional and public participation of Bulgarian cultural heritage in pan-European cultural exchange while also contributing to the protection and preservation of Bulgarian cultural heritage for future generations. The cultural institutions involved in the project include the Sofia Library, the Museum of Sofia History, and the Sofia City Art Gallery. The project's implementation aims to preserve the cultural institutions' collections, making them more accessible to the public. This will provide citizens and visitors of the capital with equal and free access to a high-quality package of cultural services, including rich web collections.

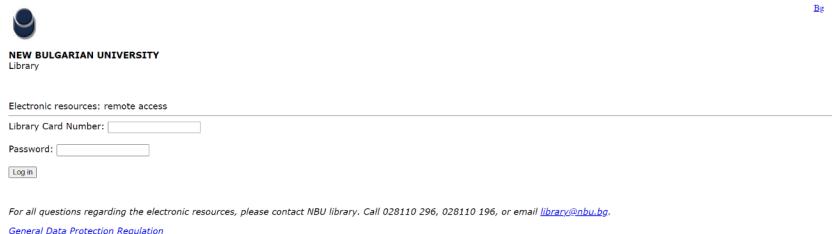
The joint partnership between the Institute of Literature at the Bulgarian Academy of Sciences, the National Museum of Literature, and the Sofia Library, from 2009 to 2014, resulted in the project 'Bulgarian Literary Classics - Knowledge for All: Unknown Archives and Cultural Contexts.' The aim of this project is to collect, systematize, digitize, and preserve the cultural heritage of 13 Bulgarian literary classics, including Petko R. Slaveykov, Ivan Vazov, Pencho P. Slaveykov, Peyo Yavorov, Elin Pelin, etc. The realization of this project contributes to the popularization of the archive among the general public, the creation of free access to it, and its transformation into a source of information for future cultural and educational products. Three digital centres have been established within the project to develop an innovative cultural and educational product. These centres include a web-based digital repository, a website featuring new literary texts, unknown and unique archival materials, as well as films and virtual collections.

THE NEW BULGARIAN UNIVERSITY'S DIGITAL LIBRARY AND SCIENTIFIC ELECTRONIC ARCHIVE.

The NBU Digital Library provides the Collection for Blind Readers, which offers electronic texts in a format suitable for playback from speech synthesizers via computer or mobile phone. This mode of reading is highly preferred by the visually impaired and has largely replaced reading via Braille.

The Scientific Electronic Archive of New Bulgarian University (SEA of NBU) is an open electronic repository that stores electronic documents for the long term and facilitates the dissemination of scientific results on the Internet.

Figure 1: The digital library of The New Bulgarian University's Digital Library and Scientific Electronic Archive .

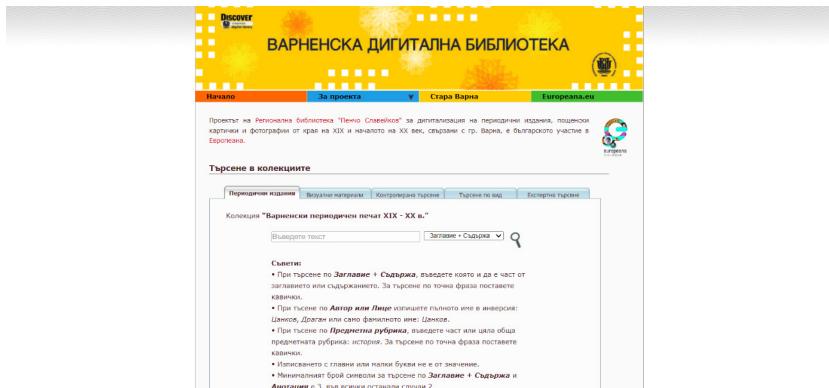


DIGITAL LIBRARY AT THE PENCHO SLAVEYKOV REGIONAL LIBRARY, VARNA

The Varna Digital Library presents a collection of various documents including photographs from the late 19th to the 20th century, postcards, photo portraits, of events, of buildings emblematic of Varna and the surrounding region as well as periodicals issued in Varna after 1880. These collections of documents are owned by the library and the cultural institutions in the city. The digitised collection includes both documents and metadata with analytical descriptions of the objects.

These are some of the digital collections created by Bulgarian libraries. The teams of experts of the respective libraries continue to work on these collections and they are being enriched on a continuous basis. However, only the National, some regional, and some university libraries have digital collections. School and community libraries are currently unable to create and maintain such collections mainly due to financial reasons.

Figure 2: The digital library of Pencho Slaveykov Regional Library, Varna.



DIGITAL LIBRARY OF THE LIBRARY AND INFORMATION CENTRE (LIC) AT ULSIT

University and academic libraries play a crucial role in the Bulgarian library and information system. They serve as leading information centres with modern services and resources, well developed in technological and organisational terms. These libraries provide information at a high professional level and are pioneers in many of the new forms of information services and resources offered (Tsvetkova, 2022).

The Digital Library of the Library and Information Centre (LIC) at ULSIT was launched in December 2020. Its purpose is to facilitate the educational and research processes at the University, and to provide controlled access to electronic information resources. To access the digital library, click on the 'Digital Library' button on the Library and Information Centre website. The library consists of four primary collections that are regularly updated:

Resources for electronic learning

For internal use only

Public Information

Free electronic resources

Access to the collections ‘Resources for electronic learning’ and ‘For Internal Use Only’ is restricted to students, postgraduate students, faculty, and staff of the University. To gain access, readers must register with the BIC librarians, sign a statement of compliance with the Copyright and Related Rights Act, and obtain a username and password for controlled access.

The collection ‘Resources for Electronic Learning’ offers access to complete learning materials in PDF format. In order to facilitate the use of the platform, the documents are organised in 45 folders, covering all fields of knowledge according to the Universal Decimal Classification. This makes it possible to search for literature in a given field without the reader having to know the specific author and title of the document, which results in a wide range of results (Tsvetkova, 2022).

To ensure accuracy and specificity of results, another way to search for documents in the Digital Library is to enter a keyword, author name, title, term, etc. in the search box.

One significant advantage of the digital platform is the ability to search the full text of documents, rather than just the metadata as is the case with electronic library catalogues. This indicates that the results obtained are comprehensive, precise, and relevant to the query.

Figure 3: The digital library of Library and Information Centre (LIC) at ULSIT.

The screenshot shows the Xerox DocuShare Education digital library interface. The top navigation bar includes links for Home, Content Map, What's New, Users & Groups, Help, and a search bar. A sidebar on the left lists categories such as Учебници, Електронни учебни ресурси, and Документи. The main content area displays a list of resources organized into folders. A table at the bottom shows a detailed list of items with columns for Owner, Edited, Size, and Actions. The interface is in Bulgarian, with a note at the top: 'Уважаваме читателите, апличи сме да спазвате Закона за авторското право и сродните му права! Молим, използвайте предоставените Ви библиотечни ресурси единствено за образователни и научни цели без търговски характер!'

Owner	Edited	Size	Actions
kristina	09/02/17	4	
kristina	18/09/14	4	
ei	25/01/21	1	
ellsa	16/11/21	2	
ei	09/04/21	1	
kristina	09/02/17	4	
kristina	09/02/17	4	
kristina	09/02/17	4	
kristina	09/02/17	13	
ei	13/10/21	4	
ellsa	18/10/21	3	
kristina	09/02/17	6	
kristina	09/02/17	3	

CONCLUSION

The overview of digital library, information and education services in Bulgarian libraries covers only a representative part of libraries that have successfully adapted to the new information environment, representing a small fraction of the Bulgarian library and information network. There are objective reasons for this situation, although the number of libraries working according to modern information standards is relatively small compared to the total number of libraries. The library and information system in Bulgaria faces challenges related to financial security, normative and legislative regulations, as well as material, technical and infrastructural provisions, but despite all of these it is making progress in developing and adapting library structures to the modern global information reality. The positive trends in this field are due to the professionalism and motivation of the professionals, the coordinated approach and interaction with the Bulgarian Library and Information Association and library and information education.

In the modern age of rapid technological change, the sustainability of library institutions proves not only possible but also necessary through the implementation of digital transformations. The digitization of library resources offers unprecedented access to information and knowledge, significantly expanding the reach and influence of libraries. It also facilitates better resource management and optimisation of operational processes, leading to higher efficiency and profitability.

Digital transformations allow libraries to adapt their services to the needs of modern society, providing platforms for online learning, access to e-books and scientific databases, as well as opportunities for virtual exhibitions and events. These innovations not only support the traditional role of libraries as repositories of knowledge, but also establish them as active centres for digital learning and cultural exchange.

In addition, through digital technologies, libraries can preserve and preserve valuable historical and cultural documents, making them accessible to future generations. This is particularly important in the

context of globalization and the digital age, where information must be easily accessible and protected from loss or damage.

For the preservation, protection, promotion and development of a country's cultural, historical and intellectual heritage, the sustainability of library institutions is crucial. Digital transformation is essential in this process, offering opportunities for modernisation and adaptation to the contemporary needs of the society. Digitising library resources is essential to improve information accessibility, regardless of location and time. However, digital transformation requires not only technological change, but also a rethinking of business models and service delivery. Active engagement with users, enhanced research opportunities and new forms of learning can be fostered by integrating new technologies and innovations into library policies. To remain relevant in an era of rapidly evolving technology and information needs, digital transformation is essential for the sustainability of library institutions. In conclusion, library institutions that successfully integrate digital transformations will not only survive, but also thrive in the future. They will continue to be indispensable centres of knowledge and culture, adapting to the changing needs of society and providing innovative solutions for access to information. The sustainability of libraries depends on their ability to adapt and use technology to their advantage, thus maintaining their relevance and relevance in the digital age.

REFERENCES

Al Dwairi, K. M. O. (2019). Advanced specialized jordanian libraries services by social media sites: Facebook. *Methods*, 9(3), 72–81. <https://www.iiste.org/Journals/index.php/IKM/article/view/47002>

Anuradha, P. (2018). Digital transformation of academic libraries: Opportunities and challenges. *IP Indian Journal of Library Science and Information Technology*, 3(1), 8–10. <http://doi.org/10.18231/2456-9623.2018.0002>

Digital Library of New Bulgarian University. (n.d.). <https://nbu.bg/bg/library/elektronni-resursi/digitalna-biblioteka>

Digital Library of Regional Library “Pencho Slaveykov” Varna. (n.d.). <http://digitallibrary.libvar.bg/index.html>

The digital library of Library and Information Centre (n.d.) <https://www.unibit.bg/en/about-unibit/administrative-units/library>

Gavrilova, Y. N. (2021). Functions of the university library in the conditions of digitalization of education 2021. *Sphere of Culture*, (1), 69-75. http://10.0.188.36/2713-301X_2021_3_69

Gerasimenko, A. Y. (2019). Formation of a unified information space of a scientific library. *Bibliosphere*, (4), 78–84. <http://doi.org/10.20913/1815-3186-2019-4-78-84>

Golubeva, E. A., & Smagina, M. V. (2020). Using the potential of electronic library systems in educational activities in higher education. *Bulletin of Kemerovo State University of Culture and Arts*, (50), 211-218. <https://cyberleninka.ru/article/n/ispolzovaniepotentsiala-elektronnyh-bibliotechnyh-sistem-v-obrazovatelnoy-deyatelnosti-vuza>

Kozyreva, A., Nazarenko, U., Shovkoplias, G., Beresnev, A., Klevtsova, E., & Gusarova, N. (2021). *Integration of social media platforms and specialized web resources for the effective use of high-tech medical information*. Proceedings of the 7th International Conference on Information and Communication Technologies for Ageing Well and e-Health (v. 1, pp. 154–162). Institute for Systems and Technologies of Information, Control and Communication, Lisboa. <http://doi.org/10.5220/0010404501540162>

Lapo, P. (2021). The role of information provision of science and education in the formation of the university digital space: The example of Nazarbayev University Library. *Prospects of Higher Education Development*, (10), 93-113. <https://cyberleninka.ru/article/n/rolinformatsionnogo-obespecheniya-nauki-i-obrazovaniya-v-formirovaniis-tsifrovogo-prostranstvauniversiteta-na-primere-biblioteki>

Lotova, E. Y., & Apakina, L. V. (2017). The new role of library as the creator and administrator of the educational portal of the university. *Electronic Libraries Journal*, 20(6):426-434. <https://www.elibrary.ru/item.asp?id=32337952>

Official Website of Sofia City Library. (n.d.). <https://www.libsofia.bg/>

Tsvetkova, E. D. (2022). *Highly sophisticated mobile technologies in library and education*. Publishing House “Za Bukvite – O Pismeneh”.

Website of the National Library Ivan Vazov. (2009). <https://libplovdiv.com/index.php/bg/2009-09-04-08-21-01>

From *pay to read* to *pay to publish*: a new beginning for *open access* in Romania

*Ivona Olariu*¹

ABSTRACT: “*Anelis Plus*” Romanian consortium has conducted four nationally and European funded projects and assumed the responsibility of promoting the principles and necessity of open access (OA) publishing. This initiative meant the beginning of training of all parties involved: authors from the academic community, university libraries professionals, master and doctoral students – who have been shown what the advantages of OA are, the pitfalls of predatory journals, as well as notions of research data management. The results obtained in past projects have been evaluated through performance indicators (PIs), which measure to what degree access to tens of databases influenced Romanian scientific performance. The current publishing European trends brought the consortium to a new beginning: transformative agreements (TA). The paper highlights the steps taken to maximize the effectiveness of the transition. The consortium has already initiated, for the first time in Romania, such measures (training for authors and library staff on relevant OA publishing topics) and evaluating their results will influence the next ones. The visibility of Romanian researchers is favored by the opportunity to publish in OA, and the lack of concern about paying article processing charges (APCs) allows them to focus on the actual scientific work and supports them in promoting it.

KEYWORDS: transformative agreements, scientific electronic resources, open access, national consortium

¹ The Association of the Universities, Research and Development Institutes and Central University Libraries in Romania “*Anelis Plus*”; “*Mihai Eminescu*” Central University Library in Iasi, Romania

E-mail: ivona@uaic.ro | ORCID iD <https://orcid.org/0000-0001-5957-0532>

<https://doi.org/10.36311/2025.978-65-5954-624-4.p177-190>

INTRODUCTION

The realities of the new information environment brought about by the development of digital scientific communication required, at the end of 2011, the aggregation of the academic and research community in Romania into a consortium-like structure, to improve the scientific research capabilities of the national research and development system and to keep the pace with international research. With as many as 100 members (public and private universities, research & development institutes, the Romanian Academy and central university libraries), the *"Anelis Plus"* Association of Universities, Research & Development Institutes and Central University Libraries of Romania was set up relying on successful European models: the Bavarian Library Consortium, the Serbian Library Consortium (KOBSON), the Electronic Information Service National Programme (EISZ) in Hungary, the Swedish Consortium (BIBSAM), etc.

Beyond the European tradition in the organization and functioning of such structures as consortia, with a similar mission, the necessity to create Anelis Plus became evident from the analysis of the statistics of the Romanian universities and the supplementary financial investments in electronic resources between 2009-2011.

Professional and scientific Association, the mission of Anelis Plus (www.anelisplus.ro) is to fulfil its members' information and documentation (I&D) needs; to undertake research and development activities; to subscribe to electronic resources (ER) of scientific I&D for education and research; to undertake promotion and study activities necessary for the implementation of the educational and research national policies, so as to answer to the growing information needs of the Romanian users; to encourage the scientific research and education in national and international projects with the purpose to increase cooperation and coordination of research activities on national and/or regional level; and to promote open access principles among the Romanian authors.

THEORETICAL FRAMEWORK

The meetings of the representatives of the regional consortia organized in 2018, 2019 and 2023 in Budapest brought together the experience of countries such as Hungary, Austria, Poland, Slovakia, Czech Republic, Slovenia, Croatia, Lithuania, Turkey and Romania in an exchange of good practices regarding the projects implemented by each of them. These events enabled easier decision-making regarding subscription criteria, choosing the methods to promote open access and users' training framework. Several common issues were analyzed comparatively: the working methods, the sources of financing, the problems that differentiate the activity depending on the national specificity, the specific legislation, and especially the common problems, for which common solutions can be found.

The scientific literature includes papers on the evolution of the open access phenomenon in European countries such as Spain, France, Italy, Portugal, Greece, Turkey (i.e. Anglada & Abadal, 2010), Germany and UK (Oberlander & Reimer, 2019) and in USA (Finnie, Moulton, 2022). Specific problems of the consortia have also been a topic tackled in literature (i.e. Elguindi & Schmidt, 2012; Lewin & Passonneau, 2012; Poll, 2012; Conghui, 2013; Horton & Pronevitz, 2015; Herold, 2021; Wissenschaftsrat German Science and Humanities Council, 2022), and a recent study about consortia assessment (Gonda & Papatheodorou, 2023) conducted research on the suitability of ISO 11620: 2014 library performance indicators to measure the performance of a consortium. The authors established a correlation between consortia services and the appropriate indicators included in the standard and how they can be implemented for collective assessment.

RESEARCH METHODS AND OBJECTIVES

The aim of this paper is to analyse the objectives and the results of the 4 projects carried out between 2013 and 2023 and to emphasize the novelties at each stage. The study highlights how the consortium has supported the research activities by providing access to quality scientific

literature, *open access* publishing and the transition from *pay to read* to *pay to publish*.

The projects *Anelis Plus*, *Anelis Plus* 2020, *Anelis Plus* 2022 and *Anelis Plus* 2023-2025 were assessed in the lights of their funding sources, the need to develop institutional repositories and continuous access to scientific literature, or the rapid changes in the way of publishing due to the European Commission's calls for support of *open access*, with undeniable advantages in terms of scientific visibility, of users' behavior and education, who are offered publication fees by including them in the cost of subscriptions.

The findings are supported by statistical data, the evaluation of some performance indicators and the identification of causes for delays in the consortium activity, constituting lessons learnt to be taken into account in the future work.

The usage statistics have been extracted at the national level, for the analyzed period. Using the standard ISO 11620: 2014, several performance indicators related to the electronic resources have been selected and the costs involved have been calculated. The results are detailed in the Findings section.

The analysis of Romanian scientific output and the experiments to waive article processing charges in 2022 and 2023 were the starting point in determining the number of APCs foreseen in the transformative agreements from 2024 onwards.

For this purpose, the number and the type of articles published by Romanian authors in recent years in the scientific journals of some collaborating publishers have been evaluated.

FINDINGS

The goal of the Project *Anelis Plus - Assuring national electronic access to scientific literature for supporting and promoting the research and education system in Romania* (May 2013 – December 2016) was to develop the research capacities and to integrate the Romanian research-development-

innovation (RDI) system to the international scientific environment by ensuring the continuity of access for the scientific and academic community to electronic scientific resources of information & documentation and developing specific methods for sustaining the research and promotional activities of researchers' work.

Funded from public budget (Ministry of National Education - Major Investments in the R&D infrastructure) - 80% and the own budget of the consortium members – 20%, its long term objective was setting a development and promotional model for additional specialized services which may support research, development and innovation (virtual campus, national repository, open access).

Anelis Plus met the specific project objectives by assuring national electronic access to scientific literature (*current subscriptions - IP-based access, mobile access, scientific archives hosted in the national repository and promoting open access*) and by creating hardware and software infrastructure for supporting and promoting the research and education (developing an integrated system for access services and scientific information storage - the implementation of a *virtual campus* (<https://portal.anelisplus.ro/acasa>) - a one-stop sign-in portal allowing the community to access scientific ER and also facilitating the collaboration between scientists and create a *national repository* (<https://dspace.anelisplus.ro/xmlui/>) to host documentation scientific resources).

The main objective of the 2nd project, (*National Electronic Access to Scientific Literature for Supporting the Research and Education System in Romania ANELIS PLUS 2020 Project 2017 - 2022*, co-funded by the European Regional Development Fund through Competitiveness Operational Program 2014-2020) was to increase Romania's Research, Development and Innovation (RDI) capacity by providing researchers with access to scientific publications and international databases. This increased the involvement of the Romanian research environment in specialized international research networks, a major step for the future development of science and technology. The success of the projects consists of continuing development of a national repository, through the acquisition of electronic archives of electronic journals and books,

to create an exhaustive documentation framework and ensuring the scientific community's access to resources (*full text* and bibliographic & bibliometric databases/ platforms of scientific journals), in order to support research, innovation and stimulation of scientific production at national level.

The national repository hosts now historical archives (journals - 2,239 titles Elsevier/ Science Direct Backfiles, 1,033 titles Springer-Nature/ Springer Online Journal Archives, 952 titles Wiley Journal Backfiles), current archives (387 titles Science Direct Journals 2016-2020) and more than 8,800 e-book titles published by Elsevier, Wiley, Springer, De Gruyter, CABI, Sage, IEEE, CUP, ALA). When assessing the e-resources investment, national PIs were calculated for the consortium as a whole and also for each of its members, according to ISO 11620 - Library performance indicators: 2014, and the conclusions reached influenced the procurement decision in subsequent projects. The aim was to subscribe to both multidisciplinary and specialized databases covering the scientific profile of all institutions involved in the project. The results of the assessment of three of these indicators are shown below.

The PIs in the ISO 11620 follows the Balanced Scorecard approach, creating an indicator framework with four major areas of measurement. The second area is *(collection) use* (i.e. number of content units downloaded per capita - to assess whether users find items of interest in an electronic resource fig. 1), the third one is *efficiency* (*collection efficiency* - i.e. cost per download - to assess the cost of a electronic resource related to the number of downloads from this resource, fig. 2), and *general efficiency* – i.e. cost per user - to assess the cost of the library's service related to the number of users, fig.3).

The most commonly used databases were bibliometric databases for research evaluation (Web of Science, Scopus), specialized databases for a highly specialized audience (i.e. IOP, AIP, Ovid), with a lower number of downloads per user. At the same time, the values for the *cost per download* indicator are low for the most accessed databases, for which the first mentioned indicator has the highest values. As for the *cost per user*, representing the ratio between the cost paid for the resource and

the number of foreseen users for that resource, high values are calculated for very high-priced electronic resources, although the number of users is also high.

These indicators have also been reported as appropriate for consortia in the study, being correlated with services for consortia (Gonda et al., 2023). The service *needs of the audience and general impact of the consortium/* needs of the audience: e-resources is reflected in the PI number of content units downloaded per capita, the service *collaborative collection development/* e-resources cooperative purchasing is connected with the PI cost per download, and the service *consortium management/* consortium efficiency is assessed by the PI as cost per user.

Fig.1: Number of content units downloaded per capita (user)

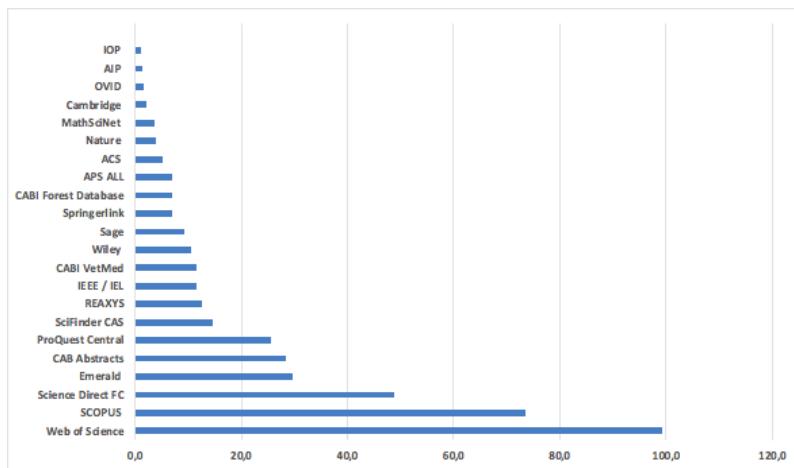


Fig. 2: Cost per download (lei - Romanian currency)

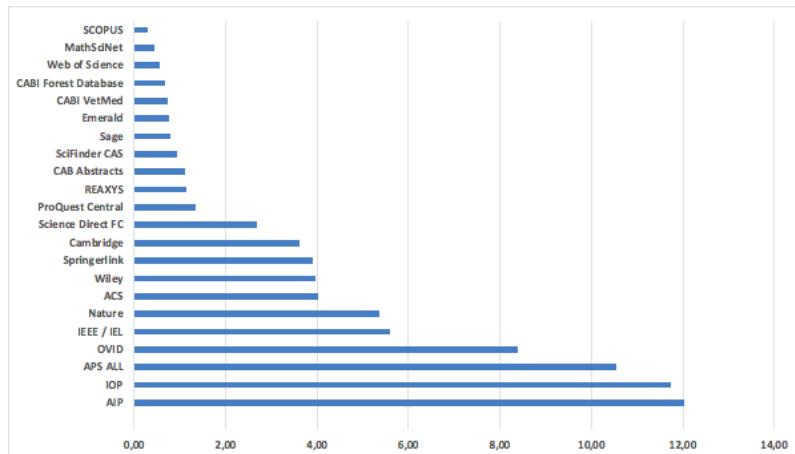
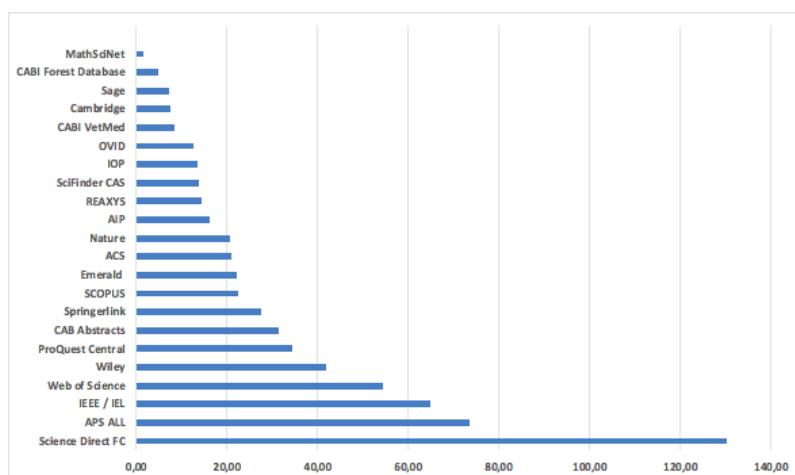


Fig. 3: Cost per user (lei - Romanian currency)



The years 2018-2022 were marked by a number of problems that had to be solved in order to continue the work, by setting up multidisciplinary work teams:

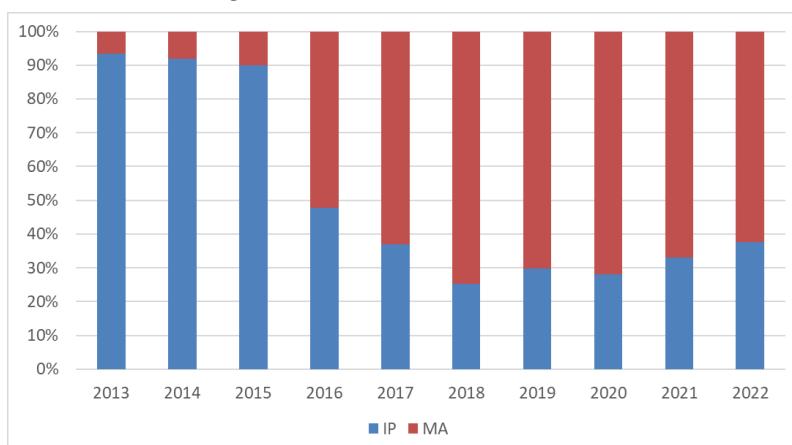
- Organizational and communication-related causes (delays in members' submission of subscription options, changes in the

selection of e-resources after national data centralization and/or need to include new institutions, need for repeated simulations of co funding due to successive changes)

- Financial causes (difficulties in obtaining financial offers from publishers, especially for those databases not previously subscribed, need to negotiate lower prices after receipt of offers due to financial constraints, delays by institutions in paying co-funding, budgetary changes from one year to the next).
- Technical causes (changes in institutional IP domains, delays in reporting lack of access from subscribing institutions); managing a database with over 150,000 users is a difficult task and therefore the solution identified was the federative authentication system based IDP (Identity Provider) of the member institutions. Also, providing mobile access through a single access point was necessary due to the exponential growth of this access mode.

In 2013, the ratio IP/MA was IP – 93,4%, MA- 6,6% and in 2014: IP- 92%, MA – 8%. IP access was predominant in 2015, but the MA increased exponentially in 2016, when those 2 were roughly equal, the ratio being in favor of MA since 2017 (fig.4).

Fig. 4: Mobile access vs IP access



The third project, “Access to scientific and technical literature” (2022 June-December) was a transition period, in addition to access to databases for 90 institutions, the 18 institutions subscribed to Cambridge Journals receiving 10 APCs as a gift to stimulate OA publishing. Unfortunately, only 3/10 were used by transforming articles already published in hybrid journals in OA.

The situation repeated itself in 2023 in the fourth project, “Access to scientific literature and publishing in OA (2023-2025)”, when the 85 participants selected access services from 42 nationally subscribed databases and were offered 15 vouchers for OA publishing in Cambridge Core Journals by the Cambridge University Press (CUP); of these, only one was used; the Royal Society of Chemistry (RSC) also offered the 9 subscribing institutions 25 APCs for publication in hybrid & gold OA subscribed titles, of which 10 were used.

DISCUSSION

2024 is the first year when the first seven transformative agreements between Anelis Plus and international publishers have been signed. Past experience has shown there is a clear need to promote OA publishing further and find ways to maximize the use of available APCs.

The low number of requests of the APCs in 2022 and 2023 led the consortium to identify Romanian authors who have traditionally published in Cambridge and RSC journals, in order to propose OA for their articles (with the advantage of increased visibility). To avoid this issue in the future, Anelis Plus designed a series of actions:

- more active promotion of the advantages – publishing OA means research is available to everyone around the world to read, cite, share and build upon;
- authors’ training (driving the process using the publisher’s platform & uploading the article; choosing the way of publishing - hybrid, gold OA journals; choosing the right journal; predatory journals – how to avoid being prey);

- library professionals' training – to correctly understand the new way of publishing and guide potential authors.

Anticipating the signing of the transformative agreements, Anelis Plus was concerned with raising awareness about the benefits of OA publishing and the facilities offered by the consortium projects. To this end communications and training for its members were organized, in 2023:

- *OA at Wiley – understanding Transformative Agreements*, hosted by the Polytechnic University of Bucharest;
- *Romanian perspectives on the future of open access publishing – transformative agreements*, at West University of Timisoara, within the International Colloquium Communication and Culture in European Romania;
- *Transformative agreements as a way of supporting scientific research and increasing the visibility of Romanian universities*, hosted by the Polytechnic University of Timisoara, within the Association of Romanian Libraries National Conference;
- *Anelis Plus & Wiley Transformational Open Access Agreement – Introduction to the new agreement and how to publish open access with Wiley, Opportunities to publish in OA Cambridge University Press journals, OA publishing with Royal Society of Chemistry – Anelis Plus experience in 2023*), hosted by the Academy of Economic Studies Bucharest;
- *Anelis Plus Consortium - 2013-2023 experiences*, Budapest, Regional Consortium Meeting
- *OA publishing: 2022-2023 experiences, 2024-2025 future plans*, hosted by Babes-Bolyai University Cluj Napoca.

Evaluating the Romanian scientific output in the previous years was important in setting the stipulations in the TA. For example, the analysis of publishing with Wiley indicated 451 papers published between 2020-

2022 (61 in gold open access journals, 46 Hindawi, 344 in hybrid journals) having corresponding authors from 23 research institutions. Taking into account the performance indicators calculated above for Wiley, the publication results and the publisher's offer, an increasing number of APCs from Wiley was estimated for the next three years: 105, 107, 109 (tab.1).

In the case of Springer Nature, the number of published scientific papers in hybrid journals is 855 hybrid (open choice), and 15 subscription; the number of fully OA papers was 257 (in 2020-2022).

The TA will include 283, 293, 303 APCs available to corresponding authors affiliated with one of 47 institutions in the next period (tab.1).

A similar evaluation of papers published with Science Direct Journals shows 648 in 2022 (core hybrid - 537, gold – 111).

Table 1 shows the number of Anelis Plus members which can benefit from TA, the number of APCs provided for the next 3 years and the type of journals where they can publish.

Tab. 1: 2024-2026 OA publishing matrix

No.	Publisher	No. of institutions	No. of APCs 2024	No. of APCs 2025	No. of APCs 2026
1.	Wiley	39	105**	107**	109**
2.	SpringerNature	50	283*	293*	303*
3.	Cambridge University Press	69	Unlimited**	Unlimited**	Unlimited**
4.	Elsevier – Science Direct	59	537*	537*	537*
5.	Royal Society of Chemistry	9	10*+10**	Unlimited**	Unlimited**
6.	IEEE	22	30**	50**	50**
7.	Institute of Physics	11	Unlimited**	Unlimited**	Unlimited**
8.	Sage	7	-	Unlimited*	Not decided
9.	Taylor & Francis	18	-	45*	Not decided

Limited/ unlimited

*Hybrid | **Hybrid/ gold open access

CONCLUSIONS

Anelis Plus Projects proved the advantage of an electronic integrated system of access to the scientific information and it has proven the *shared purchase, expanded for the whole Romanian academic scientific community, as the only way to continue national electronic access to the scientific literature in the future.*

The success of this initiative depended on the involvement of all the responsible factors – financers, co-financers and an expertise offered by the specialists from the Association in LIS. The bibliometric studies performed by Anelis Plus proved that continuing to offer access and diversification of subscriptions stimulates the quantity and quality of Romanian scientific output and facilitates permanent contact with the news in the field. The performance of the Romanian research is distributed unequally across the scientific community: the majority of the results comes from a low number of institutions.

Using the new ISO 11620: 2023 Performance indicators for libraries standard, PIs will be selected to characterize the consortium activity according to various criteria, the extent of use of the e-resources provided, the level of user training, the efficiency of the financial resources invested, etc. Transformative agreements are considered not only a way to support scientific research and increase the visibility of Romanian universities but also a chance to publish for small universities and research institutes.

REFERENCES

Anglada, L., & Abadal, E. (2010). *Open access in Southern Europe Countries*. FECYT.

Conghui, F. (2013). Library consortia in China: Cooperation, sharing, and reciprocity. In *Chinese librarianship in the digital era* (pp.113-141). Chandos Publishing. <https://doi.org/10.1016/B978-1-84334-707-1.50008-2>

Elguindi, A. C. & Schmidt, K. (2012). Academic library consortia and the evolving role of electronic resources and technology. In A. C. Elguindi, & K. Schmidt. *Electronic resource management* (pp.141-167). Chandos Publishing. <https://doi.org/10.1016/B978-1-84334-668-5.50005-5>

Finnie, E., Moulton, O. C., Russell, J. C., & Carlson, A. J. (2022). Another week, another transformative open access agreement. but just how transformative are they proving to be in practice?. *NASIG Proceedings*, 37. <https://doi.org/10.3998/nasig.4312>

Gonda, T., & Papatheodorou, C. (2023). Adjusting the library performance standards for consortia services: A case study. *Performance Measurement and Metrics*, 24(3/4), 133–154. <https://doi.org/10.1108/pmm-04-2023-0010>

Herold, I. (2021). *Leading together: Academic library consortia and advocacy*. Association of College and Research Libraries.

Horton, V. & Pronevitz, G. (Eds.). (2015). *Library consortia: Models for collaboration and sustainability*. ALA Editions.

International Organization for Standardization (2014). *ISO Standard no. 11620-2014: Information and documentation library performance indicators*. ISO. <https://www.iso.org/standard/56755.html>

International Organization for Standardization (2023). *ISO Standard no. 11620-2023: Information and documentation library performance indicators*. ISO. <https://www.iso.org/standard/83126.html>

Lewin, H. S., & Passonneau, S. M. (2012). An analysis of academic research libraries assessment data: A look at professional models and benchmarking data. *The Journal of Academic Librarianship*, 38(2), pp. 85-93. <https://doi.org/10.1016/j.acalib.2012.01.002>

Oberlander, A., & Reimer, T. (2019). *Open access and the library*. MDPI.

Poll, R. (2012). Can we quantify the library's influence?: Creating an ISO standard for impact assessment. *Performance Measurement and Metrics*, 13(2), pp. 121-130. <https://doi.org/10.1108/14678041211241332>

Wissenschaftsrat German Science and Humanities Council (2022). *Recommendations on the transformation of academic publishing: Towards open access*. <https://doi.org/10.57674/0gtq-b603>

Implications and Challenges for the Information Professional: the use of text generators

Janaina Fernandes Guimarães Polonini¹

Bárbara Souza da Silva²

Carla Conforto de Oliveira³

ABSTRACT: In the 21st century, technology has been playing an increasingly significant role in society, influencing several sectors, including text production. The investigation addresses the use of text generators, analyzing their importance in the current context, as well as their implications for information professionals in this constantly evolving technological scenario. The objective of this study is to analyze the implications of using text generators in the work of information professionals, considering their transformations in the current technological scenario. The research is bibliographic with a qualitative approach. The theoretical framework was retrieved from the Capes Periodicals Portal, in addition to consultations with specialized manuals and dictionaries on the proposed topic. Text generators are tools that can increase productivity by allowing the automation of repetitive tasks. The information specialist's trajectory is deeply linked to the ability to reconcile the incorporation of innovative technologies with the preservation of fundamental ethical principles. ChatGPT and other similar platforms have the ability to transform and improve the activities of information professionals, ensuring that technological advancement contributes to improvement, rather than damaging the integrity and effectiveness of the information process.

KEYWORDS: text generator; artificial intelligence; information professional.

¹ São Paulo State University, Marília, Brazil.

E-mail: janaina.polonini@unesp.br | ORCID iD <https://orcid.org/0000-0003-4174-8042>

² São Paulo State University, Marília, Brazil.

E-mail: bs.silva@unesp.br | ORCID iD <https://orcid.org/0000-0003-2835-5295>

³ São Paulo State University, Marília, Brazil.

E-mail: carla.conforto@unesp.br | ORCID iD <https://orcid.org/0000-0003-2960-9429>

<https://doi.org/10.36311/2025.978-65-5954-624-4.p191-208>

INTRODUCTION

In the quest for systems capable of emulating human intelligence, the term “artificial intelligence” (AI) was coined in the 1950s, marking the beginning of a significant journey (Deng & Lin, 2022; Lévy, 2022). However, the origins of artificial intelligence date back to the mid-20th century, following World War II, and it is a discipline in constant evolution (Norvig & Russell, 2022). The theoretical foundations of artificial intelligence began to be established with the pioneering work of Alan Turing, whose impact is notable (Norvig & Russell, 2022).

In the 21st century, Information and Communication Technologies (ICTs) exert a comprehensive influence on human activities, permeating everything from daily life to professional spheres, notably including textual production. The proliferation of internet-connected electronic devices, such as smartphones and computers, has significantly transformed the way we interact with and share information.

Text production, in particular, has undergone a digital transformation as ICTs enable new forms of expression and collaboration. Online platforms, social networks, and collaborative editing tools have become key elements in content creation and sharing. This instant interconnectivity has also challenged traditional communication boundaries, allowing individuals from different parts of the world to exchange ideas and perspectives instantaneously.

Moreover, ICTs have positively impacted information accessibility, democratizing knowledge and providing opportunities for previously marginalized voices to be heard. However, this technological advancement also raises concerns about information quality, privacy, and online security, necessitating ongoing reflection on how to balance the benefits of ICTs with the ethical and social challenges that may arise.

In the realm of scientific production, concerns related to plagiarism have become prominent (Lo, 2023), especially with the use of text-generating software. Although these tools offer valuable resources for enhancing writing and research, they also present ethical challenges related to the originality of academic content. Improper use of such software to

reproduce ideas without proper attribution can compromise academic integrity, undermining trust in the authenticity of scientific production. Thus, the academic community faces the challenge of finding a balance between leveraging the advantages of these tools and maintaining the ethical responsibility necessary to uphold the fundamental principles of genuine and original knowledge production.

In this context, the research focuses on analyzing the use of text generators, particularly ChatGPT, exploring its relevance in the current landscape, as well as the implications it has for information professionals in an ever-evolving technological environment. Additionally, it examines the approaches adopted by these professionals when dealing with content provided by such tools, and the efforts to promote effective and reliable text production within the digital transformation framework.

CHATGPT IN THE TRANSFORMATION OF THE INFORMATION PROCESS

The digital era, driven by the ongoing advancements in Natural Language Processing (NLP) and artificial intelligence, has witnessed a significant transformation in interaction with computational systems and information consumption. “[...] Today, AI is being used in many aspects of our lives, from healthcare and finance to retail and transportation. AI is changing how we interact with technology and how we live our lives.” (Deng & Lin, 2022, p.81).

The rapid development of these technologies, propelled by advances in machine learning algorithms, large data sets, and computational power, has enabled various applications, ranging from virtual assistants and chatbots to automatic translation and text analysis. This evolution impacts communication between humans and machines and contributes to a more refined understanding of the nuances of human language, enabling the automation of complex linguistic tasks and paving the way for the creation of more intuitive and interactive systems. The upward trajectory in these technologies, infused with artificial intelligence, indicates a dynamic future where digital communication will become even more accessible, efficient,

and integrated into daily activities, thus enhancing the interconnection between humans and artificial intelligence.

AI is a branch of computer science that focuses on creating intelligent machines that can think and act like humans. AI systems are designed to learn from their environment and make decisions based on the data they receive. AI can be used to solve complex problems, such as medical diagnosis, autonomous vehicles, and natural language processing (Deng & Lin, 2022, p.81).

The increasing use of technologies and artificial intelligence raises ethical and social questions, necessitating the transparent and ethical development of algorithms and language models (Sichman, 2021; Ray, 2023; Rodríguez Velásquez, 2023). Collaboration among governments, industry, academia, and civil society is essential in establishing regulations that guide this development, involving experts from various fields (Sichman, 2021; Rodríguez Velásquez, 2023). Additionally, it is essential to address challenges such as privacy, security, and equity in access to technology (Sichman, 2021; Deng & Lin, 2022; Rodríguez Velásquez, 2023). In this ethical and social context, understanding ChatGPT and its implications becomes even more relevant, requiring a critical and responsible analysis of the role of these technologies in contemporary society.

GPT (Generative Pre-trained Transformer) is a series of language models developed by OpenAI. These models are trained using machine learning techniques on large datasets to understand and generate text in a contextual and coherent manner (OpenAI, 2021c). “ChatGPT can be a helpful tool for text generation and comprehending natural language, but it is essential to utilize it carefully and double-check the data it generates” (Subaveerapandiyan et al., 2023, p.4).

The first version was released in 2018 (Subaveerapandiyan, Vinoth, & Tiwary, 2023). In 2019, GPT-2 expanded production possibilities, and in 2020, the GPT-3 (Generative Pre-trained Transformer 3) version, also known as ChatGPT, was launched (Subaveerapandiyan et al., 2023). ChatGPT, specifically, is designed to interact in a conversational manner,

answering questions and providing information based on the provided overview (OpenAI, 2021c).

In January 2022, its latest free version was released (OpenAI, 2021c). Since its introduction to the public, ChatGPT has been the subject of intense discussions in society. “ChatGPT, the popular chatbot from OpenAI, is estimated to have reached 100 million monthly active users in January, just two months after launch, making it the fastest-growing consumer application in history [...]” (Hu, 2023). In 2023, leaders in the technology and scientific sectors came together in an open letter calling for a halt to related experiments (Pacete, 2023).

In the same year, *The New York Times* initiated legal action against OpenAI (the creator of ChatGPT) and Microsoft (the creator of Copilot), alleging the use of content produced and published by the newspaper without proper attribution, infringing on copyright and monetization issues (Lopes, 2023). Additionally, OpenAI’s web crawler was blocked by several traditional media companies, such as BBC, CNN, and Reuters.

Another controversy emerged when a renowned author, winner of the Akutagawa Prize for best book, revealed that 5% of her work was written using ChatGPT to enhance her creative potential (Agence France Presse, 2024). This revelation raises questions related to the awarding of textual productions. Various issues are being debated regarding the use of this software.

A significant challenge related to the use of language technologies, such as ChatGPT, is the issue of the accuracy of the information provided. Due to the nature of machine learning, the model may occasionally generate responses that are not completely accurate or that could be misinterpreted. This can raise concerns about the reliability of the information conveyed, especially in contexts where accuracy is essential.

Another critical point to consider concerns the ethical and privacy limitations associated with the use of these technologies. The capacity for natural language processing may involve handling sensitive data, raising concerns about how this information is managed, stored, and protected.

Ethical implications and privacy challenges are significant areas of discussion and require careful attention to ensure responsible implementation.

Security is a fundamental concern, as the integration of natural language technologies may present vulnerabilities. This becomes especially relevant when considering the handling of personal data or critical information. Safeguarding against potential exploitation, cyberattacks, or malicious uses of these technologies is essential to ensure a secure and protected environment.

The use of chat, especially in content creation, can lead to significant disadvantages, particularly concerning copyright issues. One major problem is the risk of unintentional plagiarism (Lo, 2023), as the chat generates responses based on patterns learned during training, which may inadvertently reproduce content similar to existing works. Additionally, there is concern about the misuse of copyrighted information in the generated responses, which could result in legal implications if such information is used without proper authorization or attribution.

Another point of concern is the lack of proper source attribution. If the chat provides information from specific sources during the conversation but does not offer appropriate source citations, ethical and legal issues may arise regarding proper attribution. There is also the risk of undue monetization, especially when content generated by the chat is used for commercial purposes without proper consideration of copyright, which could result in legal consequences.

Regarding ChatGPT, Lévy (2022) states that “[...] Its neural networks resemble those of a mechanical parrot, capable only of mimicking linguistic performance without understanding anything about the content of the texts it is translating [...]. The metaphor highlights the limitations of artificial intelligence in terms of contextual understanding and meaning interpretation. Even though artificial intelligence can perform linguistic tasks, it lacks the ability to truly comprehend or extract knowledge from the texts it processes, functioning more as a machine for imitating linguistic patterns than as an agent that assimilates information meaningfully.” (p.16)

From the perspective of scientific production, the use of chat technologies also faces challenges related to information accuracy, ethical and privacy limitations, and security issues (Deng & Lin, 2022). Accuracy may be compromised, as the model can generate imprecise responses or misinterpret the context (Deng & Lin, 2022). Ethical and privacy limitations arise due to the handling of sensitive data, raising concerns about the proper treatment, storage, and protection of such information. Security is also a critical consideration, as the integration of these technologies can present vulnerabilities, particularly when dealing with personal data or critical information (Deng & Lin, 2022). Caution is necessary to avoid plagiarism, ensure proper attribution, and ensure that usage respects copyright and ethical standards in scientific production (Lo, 2023).

Additionally, ChatGPT generates text based on the input provided up to January 2022, without the capability to access external information or browse the internet. This limitation restricts the provision of accurate and up-to-date information in various fields and contributes to the broader issue of disinformation by not allowing real-time fact-checking or access to more recent data (Deng & Lin, 2022). The model may not provide adequate responses to complex questions, which, combined with the limitation of access to the latest information, highlights potential challenges related to the dissemination of correct and reliable information (Deng & Lin, 2022).

It is important to note that ChatGPT's learning capability is enhanced through regular updates, ensuring that the model remains current. The paid version offers additional features, providing users with a more comprehensive and personalized experience.

According to Subaveerapandiyan et al. (2023), ChatGPT offers a range of features applicable to various users, including: building chatbots and virtual assistants, creating language-based games, facilitating language translation, generating various types of content, and assisting researchers, educators, writers, and individuals with diverse tasks. Its text classification and sentiment analysis capabilities make it valuable for social media monitoring, while integration with text-to-speech technology enhances its applicability in interactive voice assistants.

Beyond these mentioned challenges, it is also worth noting that extensive use of these technologies can have significant social and economic impacts. Issues such as the displacement of traditional jobs, changes in communication dynamics, and excessive reliance on automation are topics that also warrant reflection and debate in society. Balancing the benefits and concerns associated with natural language technologies is a multifaceted issue that requires thorough analysis.

RESEARCH METHODS AND OBJECTIVES

Given this panorama, the research is dedicated to analyzing the use of text generators, especially ChatGPT, exploring their relevance in the current scenario, as well as the implications they have for information professionals in the midst of the constantly evolving technological context. Furthermore, it presents the approaches imposed by these professionals when dealing with the content generated by these tools, movements to promote effective and reliable textual production in the context of digital transformation.

In light of this, a pertinent question arises: how does the increasing adoption of AI-based text generators impact the role of information professionals and the ethical approaches to textual production? To address this question, a bibliographic research with a qualitative approach was conducted. The theoretical framework was sourced from the Portal de Periódicos Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES), along with consultations in specialized manuals and dictionaries on the proposed topic. The CAPES Portal was chosen due to its extensive scientific virtual collection, comprising over 50,000 journals and 455 databases, offering both national and international content. It is thus recognized in Brazil as a significant source of information for the development of scientific research.

For the theoretical basis, only peer-reviewed scientific articles published in open access from 2021 to 2023 on the topic of ChatGPT were used, available in English, Spanish, German, Chinese, and Portuguese.

A total of 677 articles with the term “ChatGPT” were identified, four articles with the term “gerador de texto” (text generator), 21 articles with the term “text generator,” two articles with the terms “ChatGPT” and “information professional,” no articles with the terms “text generator” and “information professional,” and no articles with the terms “gerador de texto” and “information professional.” Additionally, AI-based text generation software — ChatGPT — was utilized to assist in content creation across various contexts, including digital marketing, journalistic writing, virtual assistants, and even academic work.

The selected articles provided theoretical support and were essential for the development of the research. Moreover, these articles served as a comparative point, enriching the study through debates and counterarguments that deepened the analysis and conclusions reached.

ETHICAL CHALLENGES AND PROFESSIONAL INFORMATION RESPONSIBILITY

Information professionals operate across various sectors, playing an essential role in the organization, access, dissemination, and effective management of information in multiple domains. In a world where information is a valuable resource, these professionals are integral to facilitating access to information, ensuring its accuracy and relevance. In their daily work, information professionals engage in a range of activities, such as cataloging, classifying, and preserving documents and materials, as well as assisting users in searching for and obtaining relevant information. Their key responsibilities include managing collections, organizing libraries and archives, developing information systems, and conducting research and content analysis.

However, despite the importance of their work, information professionals often face significant challenges. A constant concern is the lack of financial and human resources, which makes it difficult to meet the increasing demand for information services. Additionally, the fatigue resulting from work overload and the shortage of qualified personnel can negatively impact their efficiency and productivity. From this perspective,

digital transformation, particularly the use of artificial intelligence tools like ChatGPT, can offer a promising solution.

The incorporation of digital transformation and artificial intelligence, such as ChatGPT, can bring significant benefits to information professionals. By automating routine tasks, these professionals can save time and resources, enabling them to focus their efforts on more strategic activities and those that add greater value.

Moreover, the use of artificial intelligence can help overcome challenges such as the lack of resources and personnel by providing additional support and complementing the skills of information professionals. ChatGPT's ability to process large amounts of information and deliver contextually relevant responses can significantly enhance the efficiency and effectiveness of information services, benefiting both the professionals in the field and the end users. Digital transformation, combined with the intelligent use of AI tools like ChatGPT, has the potential to revolutionize the work of information professionals, improving their capacity to manage and deliver information efficiently and effectively in an increasingly digitalized world.

However, it is essential to ensure the responsible implementation of these technologies. Ethical considerations, such as privacy and security, must remain central to the use of artificial intelligence in the information field. Careful adoption of these tools can yield substantial benefits, striking a balance between operational efficiency, alleviating professional fatigue, and ensuring integrity in information management.

In this context, understanding the importance of these tools and their impact on the role of information professionals is essential. Text generators like ChatGPT emerge as facilitators in automating repetitive tasks, which, in turn, have the potential to significantly increase the productivity of information professionals. The ability to handle large datasets and respond to questions contextually can provide a substantial advantage to professionals aiming to optimize their work practices.

The discussion regarding the suspension of content-generating artificial intelligence due to ethical concerns is complex and involves deep considerations about the impact of this technology on society (Deng &

Lin, 2022; Ray, 2023; Subaveerapandiyan, Vinoth, & Tiwary, 2023). While there are legitimate concerns about the ethical use of artificial intelligence, a more balanced approach may be more appropriate than a complete suspension.

In the first place, it is essential to recognize that content-generating artificial intelligence can bring significant benefits in various areas (Lo, 2023), including task automation, personalized content creation, and process optimization. When asked about its contributions, ChatGPT makes several statements that warrant reflection:

In the field of Education, for example, it can be a valuable tool for developing interactive and adaptable teaching materials, enriching the learning experience. However, it is imperative that there is strict ethical oversight in the development and implementation of AI. Ethical standards and guidelines must be established to ensure that AI does not promote bias, discrimination, or spread misinformation (OpenAI, 2021b).

ChatGPT demonstrates the ability to be a supportive tool in educational processes by providing assistance in specific areas with a well-established body of knowledge (Lo, 2023; Subaveerapandiyan, Vinoth, & Tiwary, 2023). However, transparency in the use of artificial intelligence is essential. Users must be aware when interacting with AI-generated content and be able to discern between information produced by humans and that created automatically. This awareness helps maintain the integrity of information and strengthens trust in emerging technologies. Many users of ICTs do not fully understand the origins of digital platform content, which can be subject to manipulation.

Instead of a complete suspension of artificial intelligence, a more effective approach might be the implementation of rigorous regulations and ethical standards, alongside ongoing investments in research and development to enhance the capabilities and safety of artificial intelligence. This approach would allow for the benefits of artificial intelligence to be harnessed while mitigating the associated ethical risks. Under these conditions, it is the responsibility of the information professional to

understand how artificial intelligence operates to contribute to the acquisition, guidance, and dissemination of the tool, considering the automation of their routine activities.

By integrating ChatGPT into their services, information professionals can enhance the user experience by leveraging the capabilities of artificial intelligence to provide quick and accurate responses.

In the field of archival science, the use of ChatGPT can streamline research processes in historical documents, offering users an intuitive way to explore and obtain information. Professionals can thus focus their efforts on more analytical tasks while ChatGPT handles more operational duties.

By adopting information science strategies, professionals can incorporate ChatGPT into digital environments, assisting in the effective organization and retrieval of information. This integration enables more efficient management of large datasets, benefiting both information professionals and end users.

In the context of libraries, information professionals can use ChatGPT to offer personalized assistance to information seekers, guiding them in locating specific materials, providing reading recommendations, and facilitating navigation through vast collections (Subaveerapandiyan, Vinoth, & Tiwary, 2023). The integration of this technology allows for more dynamic and efficient interaction, improving the quality of support provided.

Regarding scientific research, ChatGPT is questioned about its use in the preparation of academic papers (OpenAI, 2021a), and it responds about the use of the tool:

1 Manual Review and Editing:

Analyze the work generated by ChatGPT:

Make significant manual edits to ensure the content is entirely produced by you, with your personal interpretation and input.

2 Proper Attribution:

If you have cited specific information provided by ChatGPT, be sure to properly attribute those contributions to the tool in accordance with your university's citation and referencing standards.

3 Consult the University Guidelines:

Carefully review your university's guidelines regarding the use of fonts and technologies. Make sure you understand the specific policies regarding the use of AI in academic work.

4 Communicate with the Teacher or Advisor:

If you are still unsure about accepting the work, contact the professor or supervisor responsible. Explain the situation and ask if there are any flexibility or adjustments that can be made to meet the institution's guidelines.

5 Redo the Work if Necessary:

If it is determined that the use of AI is absolutely prohibited, be prepared to redo parts or all of the work, ensuring it is an entirely manual production.

6 Learn from Experience:

Use this situation as a learning opportunity. Understand your institution's policies and be aware of restrictions when using specific technologies in academic work.

Always remember to act in accordance with academic ethics and follow the rules of your institution. Communicating openly with those responsible can be the key to finding appropriate solutions to the situation.

The use of ChatGPT in academic writing presents potential issues that need consideration. One concern is the possible reduction in critical thinking skills, as the model provides instant information and may diminish the need for independent thinking and problem-solving. There are also concerns about bias in generated text, loss of creativity among researchers, misuse of technology leading to fraudulent research, and creation of misinformation, especially fake news.

Despite these challenges, ChatGPT supports researchers by summarizing documents, highlighting important ideas, providing citations, and assisting with various writing tasks. This can save time and effort, allowing researchers to focus on critical analysis and interpretation.

Therefore, in the interaction between researchers and ChatGPT, it is essential to understand the capabilities of the technology so that its use is enriching in the study process, avoiding its mere employment to reproduce answers without analysis. Encouraging constant reflection on course topics is essential to actively engage students in their learning processes, developing their questioning, analysis, and interpretation skills.

In this scenario, the introduction of innovative technologies like ChatGPT can be considered an additional resource that does not replace the role of the educator (Giraffa & Khols-Santos, 2023), but becomes a tool to enhance the learning experience. By integrating this technology, educators have the opportunity to explore new forms of engagement, encouraging students to apply their critical skills during interactions with ChatGPT, thereby expanding the possibilities for reflective learning.

In a similar context, when asked about the main reasons for using the tool by an information professional, ChatGPT (OpenAI, 2021d) responds:

Information professionals can take advantage of text generators like ChatGPT in a variety of ways to enhance their services and activities. Here are some suggestions: Content Creation (emails, reviews, or educational materials), Research Assistance (employ text generators to generate summaries or syntheses of relevant information to be used as a basis for further research), Cataloging and Automatic Indexing, Chatbots for User Service, Automatic Text Translation, Document Summarization and User Study.

According to ChatGPT (OpenAI, 2021d), the responsibility for the ethics and quality of the generated products rests with the information professional, highlighting the need for conscious and responsible use of the tool. "Human review is essential to avoid inaccurate, biased, or inappropriate information. Additionally, it is important to be aware of

ethical policies and guidelines when using artificial intelligence technologies in the information environment." (OpenAI, 2021d).

In this context, it is understood that the use of artificial intelligence, such as ChatGPT, should be properly approved and regulated within institutions, establishing clear guidelines to legitimize its outputs among professionals and users, ensuring the maintenance of quality. It is worth noting that, while ChatGPT offers notable advantages, human oversight and guidance remain fundamental elements. The synergistic collaboration between artificial intelligence and the specialized knowledge of the information professional ensures the integrity of the informational process and contributes to the effective use of this innovative technology.

CONSIDERATIONS

This article explored the implications and challenges for information professionals in the context of using text generators, with a special focus on ChatGPT. As technology continues to play a transformative role in the information process, the information professional faces a dynamic landscape, full of opportunities and complexities.

In the context of the transformation of the information process, the information professional encounters a series of challenges and opportunities inherent to the use of advanced technologies such as ChatGPT. While considering the advantages provided by this technology, the information professional must balance its growing importance with the constant and varied demands of their daily work.

Often busy with multiple responsibilities, the information professional frequently operates in small teams and performs a wide range of tasks. In the midst of these circumstances, the application of ChatGPT can prove to be an optimizing tool for some of these routine tasks, such as analyzing data on library space usage and collections. This helps identify usage patterns and thus assists the information professional in focusing on areas for improvement.

However, the implementation of these technologies requires careful consideration of ethical and human rights issues. The information professional must be aware of the potential impacts on information access, privacy, and equity, ensuring that the use of ChatGPT aligns with ethical principles and fundamental values.

Additionally, to ensure the successful adoption of ChatGPT, the information professional must develop effective advocacy skills. This includes the ability to promote the benefits of the technology for enhancing activities and functions, persuading stakeholders of the tangible benefits that can be achieved.

Functions that can be enhanced by ChatGPT include the automation of repetitive tasks, the analysis of large volumes of data, the personalization of information services, the creation of quality textual content, and assistance in making informed decisions. By adopting and integrating ChatGPT in an ethical and strategic manner, the information professional can optimize their work practices and contribute significantly to the efficiency and effectiveness of the information process.

Nevertheless, the implementation of these technologies does not come without challenges. The responsibility of effectively communicating the usefulness of these technologies and garnering support for their implementation also falls on the information professional, requiring sharp advocacy skills.

It is essential for the information professional to promote media literacy among users. Media literacy, which encompasses the ability to analyze, evaluate, and create content critically, becomes essential in equipping individuals with the necessary skills in the information age. In particular, librarians have the responsibility to offer media literacy courses, providing guidance on the critical discernment needed to interact with text and image generators. This includes raising awareness about major free content creators, empowering users to distinguish between reliable information and misinformation. By offering such courses and guidance, librarians help build informed and empowered communities, contributing to the mitigation of misinformation in the digital age.

Ultimately, the role of the information professional is intrinsically linked to their ability to balance the adoption of innovative technologies with the preservation of fundamental ethical values. ChatGPT and other similar tools have the potential to revolutionize and optimize the activities of the information professional, ensuring that technological evolution contributes to enhancing, rather than compromising, the integrity and effectiveness of the information process.

Thus, ChatGPT can be utilized as a tool to assist the information professional, as it aligns with the evolution of society and technology, incorporating new resources into their practice. Currently, the use of this resource by the information professional has not been fully established; however, with ongoing technological advancements, emerging needs of information users, and digitalization, ChatGPT, like other text generators, may become significant allies for these professionals, aiding and supporting their daily tasks.

This research only investigates the use of ChatGPT by the information professional, leaving room for the development of new studies with other text generators and artificial intelligence that can be used by these professionals. Future work is not limited to existing AI tools but also opens up a world to be developed and discovered through more personalized and tailored systems, crafted by both technology and information professionals.

REFERENCES

Agence France Presse. (2024, Janeiro 1). Autora japonesa premiada admite que ChatGPT escreveu parte de seu romance. *O Globo*. <https://oglobo.globo.com/cultura/livros/noticia/2024/01/18/autora-japonesa-admite-que-chatgpt-escreveu-parte-de-seu-romance.ghtml>

Deng, J., & Lin, Y. (2022). The benefits and challenges of ChatGPT: An overview. *Frontiers in Computing and Intelligent Systems*, 2(2), 81-83. <https://doi.org/10.54097/fcis.v2i2.4465>

Giraffa, L., & Khols-Santos, P. (2023). Inteligência Artificial e Educação: conceitos, aplicações e implicações no fazer docente. *Educação em Análise*, 8(1), 116-134. <https://doi.org/10.5433/1984-7939.2023v8n1p116>

Hu, K. (2023, February 2). ChatGPT sets record for fastest-growing user base: Analyst note. *Reuters*. <https://www.reuters.com/technology/chatgpt-sets-record-fastest-growing-user-base-analyst-note-2023-02-01/>

Lévy, P. (2022). IEML: rumo a uma mudança de paradigma na Inteligência Artificial. *MATRIZES*, 16(1), 11-34. <https://doi.org/10.11606/issn.1982-8160.v16i1p11-34>

Lo, C. K. (2023). What is the impact of ChatGPT on education?: A rapid review of the literature. *Education Sciences*, 13(4), 1-15. <https://doi.org/10.3390/educsci13040410>

Lopes, A. (2023, December 27). Jornal ‘New York Times’ processa OpenAI e Microsoft por violação de direitos autorais. *Exame*. <https://exame.com/inteligencia-artificial/new-york-times-esta-processando-a-openai-e-a-microsoft-por-violacao-de-direitos-autoriais/>

Norvig, P., & Russell, S. (2022). *Inteligência Artificial: Uma abordagem moderna* (4a ed.). GEN LTC. (Obra original publicada em 2013).

OpenAI. (2021a). How to properly use ChatGPT to prepare academic work? *ChatGPT*, 2021a. <https://chat.openai.com/chat>

OpenAI. (2021b). What are the advantages of using ChatGPT? *ChatGPT*, 2021b. <https://chat.openai.com/chat>

OpenAI. (2021c) What is ChatGPT? *ChatGPT*, 2021c.

OpenAI. (2021d) Why should information professionals use ChatGPT? *ChatGPT*, 2021d. <https://chat.openai.com/chat>

Pacete, L. G. (2023, March 30). O que diz a carta assinada por Musk e milhares contra experimentos de IA? *Forbes Brasil*. <https://forbes.com.br/forbes-tech/2023/03/o-que-diz-a-carta-assinada-por-musk-e-milhares-contra-experimentos-de-ia/>

Ray, P. P. (2023). ChatGPT: A comprehensive review on background, applications, key challenges, bias, ethics, limitations and future scope. *Internet of Things and Cyber-Physical Systems* 3, 121-154. <https://doi.org/10.1016/j.iotcps.2023.04.003>

Rodriguez Velásquez, F. (2023). O ChatGPT na pesquisa em Humanidades Digitais: Oportunidades, críticas e desafios. *TEKOÀ*, 2(2), 1-5. <https://revistas.unila.edu.br/tekoa/article/view/3711>

Sichman, J. S. (2021). Inteligência Artificial e sociedade: avanços e riscos. *Estudos Avançados*, 35, 37-50. <https://doi.org/10.1590/s0103-4014.2021.35101.004>

Subaveerapandiyan, A., Vinoth, A., & Tiwary, N. (2023). Netizens, academicians, and information professionals' opinions about AI with special reference to ChatGPT. *Library Philosophy and Practice* (e-journal). <https://philpapers.org/archive/ANAAFT.pdf>

Records Manager facing the demands of sustainable development and personal data protection: two important issues of the 21st century

*Cecília Preciosa Cabsela*¹

*Gildo Carlos Macie*²

*Sonia Maria Troitiño Rodriguez*³

ABSTRACT: The 21st century is marked by various events that affect information from its production to its access and the activities and professions are impacted by the development of Information and Communication Technologies and the climate change. This article asks “what is the role of the records manager in the fulfilment of the sustainable development goals and the personal data protection?” Therefore, it aims to analyze the role and the skills of the records manager in sustainable development including climate change and personal data protection in the 21st century. The article presents a qualitative, exploratory and descriptive research. Thus, the article identified that the records manager must develop a disaster plan focusing on both analogue and digital records. The article found out that the responsibility of data protection is one of the functions being

¹ São Paulo State University, Marília, Brazil.
E-mail: cp.cabsela@unesp.br | ORCID iD <https://orcid.org/0000-0002-2216-5792>

² São Paulo State University, Marília, Brazil.
E-mail: gc.macie@unesp.br | ORCID iD <https://orcid.org/0000-0003-4800-6551>

³ São Paulo State University, Marília, Brazil.
E-mail: sonia.troitino@unesp.br | ORCID iD <https://orcid.org/0000-0002-7204-3283>
<https://doi.org/10.36311/2025.978-65-5954-624-4.p209-227>

carried out by records managers. This article concludes that records managers should be considered to manage personal data protection because of their skills on organization's culture; because they know how the organization's recordkeeping systems work; etc. This article also concludes that records managers must talk about climate change at every level of their institution and add climate change issues to their policies.

KEYWORDS: Records manager; personal data protection; climate change; sustainable development; information professional.

INTRODUCTION

Events that affect information from its creation to its access and/or destruction have marked the 21st century. In this century, information professions are impacted by the development of Information and Communication Technologies (ICT) and the climate change. This raises concerns about sustainable development and personal data protection. As Pinto (2013) pointed, in the first decade of the 21st century, activities deeply rooted in age-old practices associated with information are thus suffering the impact of changes and are being called upon to face a challenge that is not, in fact, limited to the sphere of ICT. So, one of the information professionals affected by this situation is the records manager who has a great responsibility and very challenging demands.

This professional is concerned with ensuring information quality in sustainable development or about personal data. Records manager has knowledge and skills needed to ensure that data, information, and records are managed and remain accessible and useable for long term. This professional is critical to data work as including Information Technology professionals, legal specialists, risk and security professionals, health and business users, also senior managers or those who make decisions, who can advocate high-quality and effectively managed information (Shepherd & McLeod, 2020).

Considering that actions related to climate change give impetus to sustainable development and that combating and/or confronting climate change and promoting sustainable development mutually reinforce the two sides of the same coin, we understand that sustainable development is achieved with actions in favor of the climate.

So, the topic of sustainable development and the personal data protection has been raised for discussion around the world and in various areas of knowledge and as an object of action by different professionals, but it is still little discussed in information science and from the perspective of the information professional, specifically the records manager. Thus, in a global context in which climate change has been felt more and more and, at the same time, societies have been increasingly immersed in a digital world that risks their privacy, discussing these two intersecting topics through the records manager is extremely important in order to call the attention of records managers to the important role they play in relation to these topics, but also to call the attention of other professionals, decision-makers, governments, etc. to the importance of this information professional, in facing the demands of the 21st century, specifically sustainable development and personal data protection.

This article asked, “what is the role of the records manager in the fulfilment of the sustainable development goals and the personal data protection?” Therefore, it aimed to analyze the role and the skills of the records manager in sustainable development goals including climate change, and personal data protection in the 21st century. These objectives led to the design of the methodology used to conduct this research. In these terms, the research carried out is qualitative in approach, exploratory, and descriptive research. It is the result of a literature review and documentary research in which the data collected was subjected to content analysis.

Sustainable development and personal data protection are the concepts that supported the development of this article. The concept of climate change was discussed in relation to sustainable development. Thus, the discussion raises classic texts on these subjects and goes through the SDGs, as well as the GDPR. Therefore, the literature review is the necessary process to assess what has already been produced on the subject and, from there, to situate the contribution that the planned research can make to the knowledge of the object to be researched, elaborated with the aim of providing a theoretical framework for the research (Severino, 2017; Gil, 2022).

Qualitative research answers very specific questions. It works with the universe of meanings, motives, aspirations, beliefs, values, and attitudes (Marconi & Lakatos, 2022, 2023). As indicated above, the aim of this work was to analyze the role and the skills of the records manager in sustainable development including in climate change and in personal data protection in the 21st century, an exercise that is appropriate because we have analyzed, not quantitatively, the content of the texts discussed within the scope of the literature review, allowing us to identify in these texts, the roles and/or skills of the records manager both in sustainable development and in the personal data protection.

Research differs from one another, and in terms of their purposes, they can be classified as exploratory, descriptive, and explanatory (Gil, 2022). Given the objectives of our research, it is classified as exploratory-descriptive. The combination of these two is because the purpose of exploratory research is to provide greater familiarity with the problem, with a view to making it more explicit. Exploratory research helped us to better delimit the research. As far as the descriptive part is concerned, this research identified the existence of relationships between “records manager and sustainable development” and “records manager and personal data protection”. They also serve to provide a new view of the problem (Gil, 2022).

According to Marconi and Lakatos (2023) the characteristic of documentary research, “[...] is to take as a source of data collection only documents, written or not, which constitute what are called primary sources” (p.202). In addition, they also talk about types of documents. Among them, they highlight written documents, consisting of official documents, parliamentary publications, legal documents, statistical sources, administrative publications, and private documents. In this article we used, for example, some reports from United Nations about sustainable development.

Bardin (1977) defines content analysis as “[...] a set of techniques for analyzing communications in order to obtain indicators that allow the inference of knowledge regarding the conditions of production/reception of these messages.” (p.42). Content analysis is a method of processing and analyzing information embodied in a document, gathered by means of

data collection techniques. It is applied to the analysis of written texts, or any communication translated into a text or document. Its aim is to understand the meaning of communications, their manifest or latent content, their explicit or hidden meanings (Chizzotti, 2000). We used this method to understand the role of records manager.

BASICS ON RECORDS MANAGER, SUSTAINABLE DEVELOPMENT AND PERSONAL DATA PROTECTION

In this section we discuss the notions and duties of records managers (records management), sustainable development goals and personal data protection, introducing in a more general way the relationships that are established between the activities and functions carried out by this information professional in the fulfilment of sustainable development goals and the personal data protection.

RECORDS MANAGER AND RECORDS MANAGEMENT

We cannot talk about records manager without understanding what a record is. Marsh et al. (2005) remembers us that records have existed since the first human found a way to record an activity or event by scratching a symbol on a piece of stone or daubing ochre on cave walls. So, the records manager's role has evolved from the Stone Age to the Digital Age, driven by changes in information technology, storage media, recordkeeping regulations, and the globalization of business practices. In the same vein, Schwaitzer et al. (2021) believe that traditionally, archival practice until the first half of the 20th century was limited to documents for permanent preservation, due to their historical, evidential, or informative value.

We would like to emphasize a couple of definitions of a record, which are useful for this article. Shepherd and Yeo (2003) understand records as a product of organizational activity, created during or after completion of the activity itself. The International Organisation for Standardization (ISO) has the “standard ISO 15489-1:2016 Information and documentation” which defines record as “information created, received and maintained as

evidence and as an asset by an organization or person, in pursuit of legal obligations or in the transaction of business”.

For his part, McDonald (2020) says that records refer to recorded information produced or received in the initiation, conduct and/ or completion of activities and that document those activities. He adds that they are a special form of recorded information or data. When well-managed, they comprise content, context, and structure sufficient to provide evidence of the activities. They include all forms of recorded information, including data and statistics, that can serve to document the activity. So, who manage it is a records manager.

The ISO 15489-1:2016 defines records management as “field of management responsible for the efficient and systematic control of the creation, receipt, maintenance, use and disposition of records, including processes for capturing and maintaining evidence of and information about business activities and transactions in the form of records. In this sense, McDonald (2020) understands that records management is the management function responsible for efficient and systematic control of the creation, receipt, maintenance, use and disposition of records. It enables ongoing capture and continued accessibility of high-quality, authentic, reliable, accurate, complete, relevant, and timely records.

It can be said that records management enables documents produced in any medium to be handled effectively and efficiently, considering their value to the organization and to society, based on an evaluation process. As Schwaitzer et al. (2021) said, records management is important because it allows records to be handled, organized, and disseminated effectively and efficiently, considering the values they have for the organization through document evaluation. And Beckles (2014) adds, records management should be recognized as a specific corporate responsibility within every organization. It should provide a managerial focus for records of all types, in all formats throughout their lifecycle, from creation through to ultimate disposal. The records management function should have clear responsibilities and objectives and be adequately resourced to achieve them.

So, a record manager is an information professional responsible for efficient and systematic control of the creation, receipt, maintenance, use and disposition of records. He enables ongoing capture and continued accessibility of high-quality, authentic, reliable, accurate, complete, relevant, and timely records.

SUSTAINABLE DEVELOPMENT AND CLIMATE CHANGE

In recent years, the issue of sustainable development and climate change has sparked several debates in various fields of knowledge. In fact, climate change is one of the greatest contemporary threats to archival repositories and the records in their custody (Tansey, 2015). However, it is notable that in Information Science it has not yet been debated to any great extent. Indeed, Oliver (2021) shows that much of the literature on climate change and its impact on cultural heritage is focused on built heritage. This demonstrates the need for more research on movable cultural heritage, and documentary heritage, and climate change. In this subsection, we seek to present not only the notion of sustainable development but also a regard on the 17 sustainable development goals (SDG) with a greater focus on the goal more specifically orientated towards climate change.

Brundtland (1987 as cited in Ross, 2009, p.34) defines sustainable development as “[...] development that meets the needs of the present without compromising the ability of future generations to meet their own needs”. According to Yinuo (2023) sustainable development is how we must live today if we want a better tomorrow, by meeting present needs without compromising the chances of future generations to meet their needs. So, three different aspects must be considered: economic growth, social inclusion and environmental protection.

These three balls are distributed in the 17 SDGs. They are the centre of the 2030 Agenda for Sustainable Development, adopted by all United Nations Member States in 2015, which provides a shared blueprint for peace and prosperity for people and the planet, nowadays and in future (United Nations, n.d.). They are: No poverty; zero hunger; good health and wellbeing; quality education; gender equality; clean water and sanitation;

affordable and clean energy; decent work and economic growth; industry, innovation, and infrastructure; reduced inequalities; sustainable cities and communities; responsible consumption and production; climate action; life below water; life and land; peace, justice, and strong institution; partnership for goals.

The thirteenth goal on climate action is the goal we are focusing on in this article. It aims to strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries; integrate climate change measures into national policies, strategies, and planning, and improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning.

As can be seen, the information professional, more specifically the records manager, must be aware of these actions, not only to preserve records related to a variety of subjects, but particularly records that contain data and information related to climate change, so that natural and/or legal persons, public and/or private institutions, or even States will know where they stand in relation to climate change, whether in terms of mitigation or in terms of ability to respond to climate change.

The records are threatened by gradually shifting weather patterns and extreme events. An increase in temperature together with changes in precipitation, relative humidity and wind, for instance, can negatively impact on the materials. This is because a change in average climatic conditions as well as changes in the frequency and intensity of severe weather events can affect the biological, chemical and physical mechanisms leading to degradation (Sesana et al., 2018). Furthermore, where possible, paper records management processes should be as environmentally friendly as possible, as indicated by National Health Service (2023), this will help to contribute towards the target to reduce its carbon footprint and environmental impact.

PERSONAL DATA PROTECTION

It's not news that in the recent years there has been a growing popular feeling that information about people stored and processed on computers could be misused. In fact, in 1996, Jones-Evans already said that it is fair to say that it is possible that an individual could be harmed quite easily by the existence of inaccurate or misleading information about him or her being held on a computer and transferred to unauthorized third parties at high speed and with little expense. However, protecting personal data is not just about securing it from unauthorized access or theft. There are also growing concerns about how even legally obtained data is used (Gulyamov & Raimberdiyev, 2023).

Bagatini and Guimarães (2019) also point out that by using computerised solutions daily, citizens have started to create traces of their behaviour which are interpreted as personal data because they refer to their actions and reveal physical or personality characteristics. This set of data is now a worrying product of the surveillance market, so the protection of users' personal data in archive and library databases has become a determining element, the preservation of which falls primarily to the information professional.

It seems that the emergence of the right to privacy come from the English Magna Carta of 1215, and it is associated with the rise of the bourgeoisie and the growth of urban centres. It is widely recognized, however, that the paper "Right to Privacy", published in 1890, drew attention to the issue by discussing the right to be left alone. Another point is that, in 1948, the Universal Declaration of Human Rights guaranteed the right to privacy (Schwaitzer, 2020). Nowadays, the European Union's General Data Protection Regulation (2016) is the model that several countries use to legislate on the personal data protection, as is the case of Brazil with its General Personal Data Protection Law (2018). Analyzing this last one, especially its general principles Schwaitzer (2020) defends that who knows how to identify, access and restrict as well as best help archival institutions and memory centres to promote compliance with the law is the records manager.

Personal data refers to a set of information, data and metadata produced from behaviour in both online and offline environments, whose personal nature stems from the fact that they are created by and about a natural, identified or identifiable natural person, voluntarily, observed or inferred. It can be sensitive when it relates to aspects such as religious convictions, political opinions, sexual life, biometrics, genetics, health, racial or ethnic origin and membership of a religious, political, or philosophical organization (Bagatini & Guimaraes, 2019).

In Jones-Evans's (1996) text mentioned above, the author spoke of "Implications for records manager working in sectors affected by the Data Protection Act" (p.33) and he pointed that the six important areas covered by the Data Protection Act from United Kingdom are social security, social services, the police, national security, academic records, and personal finance, although the Act impacts on all types of organizations in every sector. It's important to remember that a records manager could work in any organization and any sector, so this professional is largely concerned with personal data protection issues. So, records managers must, for example, be aware of the use of various technological tools, which can be used both to carry out their core activities and their support activities. Thus, although much of the personal data in custody in archives, countless others continue to be collected during its activities (Schwaitzer, 2020).

RECORDS MANAGER'S ROLE IN SUSTAINABLE DEVELOPMENT

Having introduced the notion of sustainable development and presented the 17 sustainable development goals with more precision to the thirteenth goal on climate action, here in this section we specifically indicate the role of the records manager in the prosecution of this goal.

It is important to notice that records should document processes, decisions, actions, activities, and communications; protect rights and entitlements; inform policies and hold officials accountable for their actions. Any set of information, regardless of its structure or form can be managed as a record. This includes information in the form of

a document, a collection of data or other types of digital or analogue information that are created, captured and managed during business (Thurston, 2020). While data and statistics provide the essential basis for measuring the SDG, records contribution in terms of documenting processes, protecting integrity and enabling preservation is also essential. Records standards make it possible to extract, disaggregate, protect and preserve data, statistics and records documenting SDG measurements to 2030 and beyond (Thurston, 2020).

Therefore, the achievement and measurement of the SDG depend on the availability of trustworthy data from a variety of sources. Records, especially records created by government agencies, are often identified as one of the most important sources from which such data can be derived (Lowry, 2020). With stronger records management across governments, the data needed to derive accurate, reliable and authentic statistical information relating to progress on the SDG are achievable. Furthermore, the SDG agenda requires that these records remain accessible to 2030 and beyond, which, in the digital world, can only be achieved through continuous active management (Brown, 2020).

Records manager is a professional connected to the future, and sustainable development is a challenge that must be faced by investing time, money and energy into changing practices. It should also be noted that there are many guides available to assist records managers in developing a disaster plan specific to their institution and recover from a disaster. In addition to these manuals, there are also many online resources from professional associations (Oliver, 2021).

The following table is the result of analyzing the work of Shepherd and McLeod (2020), and Oliver (2021). It's pointing a series of roles for the records manager in sustainable development.

Table 1: Records manager's roles in sustainable development

Category	Roles
Legal, Ethical and communication role	Must talk about climate change at every level of their institution and add climate change issues to their policies.
	Must also make the institutions dedicate and prioritize resources to records physical spaces.
	Should share what they are doing at conferences, in journals, in blogs, etc. It will be vital to build a community of practice.
Technical and Technological role	Should consider how retention scheduling decisions could support degrowth collection strategies.
	Records managers are experts in risk analysis and risk tolerance through their work in business continuity and vital records planning.
	Should contemplate the possibility of moving or decentralizing records if their regional climate is no longer liveable. This may reduce the risk of losing entire holdings in continued disasters or extreme weather events.
	Must advocate for the inclusion of records in climate adaptation strategies at the municipal, provincial and national level.
	Professional associations should include sustainability as a fundamental principle guiding the work of records managers.
Educational and collaborative role	Must train new and emerging records managers in sustainable practices.
	Must impregnate practices with sustainability and resiliency so that future records managers would carry out their jobs and ensures the preservation and access of data, information and records.
	Need to develop profession-wide climate adaptation strategies. They can identify funding opportunities to develop and implement climate adaptation strategies.
	Need to collaborate with architects, engineers, conservation scientists and others working on retrofit solutions to increase the sustainability and resilience of buildings housing records. Need to consider climate adaptation planning across various sectors and collaborate with colleagues across professions.

Note. Adapted from Shepherd and McLeod (2020), and Oliver (2021).

RECORDS MANAGER'S ROLE IN PERSONAL DATA PROTECTION

Above we introduced the concept of personal data protection, briefly discussed the history of data protection and gave a general overview of its relationship with the records manager. Here in this section, we look in more details at the role of this information professional in personal data protection. So, let's start by quoting Bagatini and Guimarães (2019) who

say that a records manager, as an information professional committed to social welfare, takes a preventive, proactive and constantly alert attitude towards the “traps” that can risk the personal data.

Lowry (2020) points that rather than simply reconceptualizing records as data, records managers, at least in their own professional discourse, might usefully be encouraged to understand data as records. Viewing data as records reminds us that data are shaped by their cultural contexts and that effective use and comprehension of them will only be possible if knowledge of their contexts is safeguarded. Or as Schwaitzer et al. (2021) point out, recognizing that data as informational units, needs to be organized in a meaningful way to be transformed into information; that information is only reliable, complete and authentic when it is recorded. Another relevant point is that, after the data protection legislation, it must be recognized that record manager is the one who can best understand that data is an intrinsic element of records, which requires processing and must be eliminated after the end of the period provided by law, and if this does not happen, the professionals may face the penalties provided for.

Lowry (2020) argues that the quality of the data depends on the quality of the original records from which they are drawn. The reliability, accuracy and trustworthiness of the records determine the reliability, accuracy and trustworthiness of the data and statistics derived from them. He adds that “poorly kept records result in inaccurate, incomplete or unverifiable data, which can lead to organizations wasting resources attempting to process or analyses data that are of poor quality”. In these situations, government can be misled into making ill-informed decisions with potentially damaging consequences. Therefore, the procedures used for records manager are essential for the control and security of personal data held by those who offer or provide goods or services and the guarantee of fundamental rights results from the effectiveness of a record management program and the effective performance of the records manager (Schwaitzer et al., 2021).

Records management has an important role to identify, classify and distribute company information assets. Especially in the 4.0 era where data and information are growing and exchanging very quickly. Records

management certainly requires its own information system, electronic data, and human resources who can understand how the development of records and information management in (Grataridarga, 2021). In 1996, Jones-Evans said that the data protection, whether in computerized or manual form, is obviously at the heart of the records manager's responsibility and the introduction of Data Protection legislation has an impact on records management that provide an opportunity to raise the profile of records management as a key business function for all organizations. In these terms, records managers must make a more detailed assessment of the legal and regulatory environment in which their organization operates.

So, the legislation may take different forms, and the details will vary from one country to another and organizations operating internationally will need to take account of the law in each country concerned. Obligations to create or retain records may be imposed by laws or regulations that are specific to a particular employment sector or a particular activity, and by the scope: privacy laws and laws on freedom of information. In many countries, systematic records retention and destruction procedures are also needed for compliance with privacy or data protection legislation (Shepherd & Yeo, 2003).

For example, one of the aims of records management is to separate records that should be placed in the permanent archive from those that can be disposed of, to guarantee control and the individual right of access to information, respecting the eventual and temporal restrictions for full access (Schwartz et al., 2021). Records that don't contain personal data or confidential material can be destroyed in a less secure manner. Jones-Evans (1996) advises, if in doubt, material should be treated as confidential and evidentially destroyed and not use the domestic waste or put records on a rubbish tip to destroy identifiable, confidential material because they remain accessible to anyone who finds them.

The following table is the result of analyzing the work of Shepherd and Yeo (2003), Beckles (2014), and Schwartz et al. (2021). It's pointing a series of roles for the records manager in personal data protection.

Table 2: Records manager's roles in personal data protection

Category	Roles
Legal, Ethical and communication role	Inform individuals of the intent behind the use of their personal information and the organization's commitment to ensuring a fairly and lawfully treatment.
	Carry out regularized privacy risks assessment surveys for records throughout the organization.
	Incorporate training and awareness about data protection legislation and policies and procedures in the training programs for staff at all levels. Take pro-active and preventive steps.
Technical and Technological role	Map the use of records in the system throughout every working group in the organization and give the right security clearance to only those officers who are authorized to access the records containing personal data.
	Use redaction methods to allow sensitive information to be visually blocked from unauthorized persons while enabling them to view requested information. Softwares are utilized to carry out this task with electronic documents. In the traditional paper world, the records manager would need to manually hide personal information on any data subject to data protection before supplying it to the requester.
	Anonymize, pseudonymize and use encryption, so that individuals are no longer identifiable, or the name of an individual is replaced by pseudonyms to prevent an individual from being singled out. The use of encryption as a security measure to protect sensitive data is highly recommended when storing records containing personal data electronically.
	Establish audit trails and conduct regularized audits involving the capture of metadata that would show who saw the record; who modified the record; on what date was the record accessed; who printed the record; who removed the record from the system or who attempted to destroy, alter or illegally export personal data from the record (electronic).
	Should seek to arrange records to facilitate quick retrieval and comprehensive control of records containing personal data by designing classification schemes.

Note. Adapted from Shepherd and Yeo (2003), Beckles (2014), and Schwitzer et al. (2021).

CONCLUSION

Sustainable development and the personal data protection are subjects that fall within the remit of the records manager. As a way of better understanding it, the aim of this article was to find out in more detail

“what is the role of the records manager in the fulfilment of sustainable development goals and the personal data protection?” The role and skills of the records manager in the sustainable development goals were analyzed, especially the thirteenth goal on climate action, as well as the role of this information professional in the personal data protection.

Thus, the article identified that the records manager has essential role and skill for delivering quality information for effective support to international development and the SDGs. As we have discussed above through Shepherd and McLeod (2020), records managers have the skills to deliver accountability requirements through consistently applied records management policies and standards to ensure continued accessibility and authenticity of records in all formats through time. Records managers must implement information access regimes that are compliant with legal, regulatory and ethical practices. They are also trained trainers, so that they can develop information skills training for all organizational staff.

In terms of personal data protection, the article found out that the responsibility of data protection is one of the functions being carried out by records managers. This article concludes that records managers should be considered to manage personal data protection because of their skills on organization’s culture; because they know how the organization’s recordkeeping systems work; how to design classification schemes and retention schedules; etc.

Whether it’s sustainable development or the personal data protection, records managers must work more closely with other professionals than ever before. So, this article serves as a first step in the subsequent article which aims to map the institutions at central level that have a records management program in Mozambique and check whether they address issues of climate change, sustainable development and the personal data protection.

REFERENCES

Bagatini, J. A., & Guimarães, J. A. (2019). *A vulnerabilidade dos dados pessoais: Um iminente desafio ao fazer arquivístico*. Memorias del XIII Congreso de Archivología del Mercosur (p.709). Universidad Nacional de Asunción.

Bardin, L. (1977). *Análise de conteúdo*. Edições 70.

Beckles, C.-A. (2014). *International perspectives on data protection and its relationship to records management: Recommendations for emerging practice in the West Indies* [Ph.D., University of Dundee]. <https://discovery.dundee.ac.uk/en/studentTheses/34dcc74f-52ca-4189-a663-ec3ffd2de13b>

Brown, A. (2020). Preserving the digital evidence base for measuring the Sustainable Development Goals. In A. Thurston, (Ed.). *A matter of trust: Building integrity into data, statistics and records to support the achievement of the sustainable development goals* (chap. 9). University of London Press. <https://doi.org/10.1429/6/1220.9781912250356>

Chizzotti, A. (2000). *Pesquisa em ciências humanas e sociais* (4a ed.). Cortez.

Gil, A. C. (2022). *Como elaborar projetos de pesquisa* [E-book]. Grupo GEN. <https://integrada.minhabiblioteca.com.br/#/books/9786559771653/>

Grataridarga, N. (2021). *Records management and records manager on the 4.0 Industry in Indonesia*. Proceedings of the 4th International Conference of Vocational Higher Education: Empowering Human Capital Towards Sustainable 4.0 Industry (pp.424-430). Universitas Indonesia.

Gulyamov, S., & Raimberdiyev, S. (2023). Personal data protection as a tool to fight cyber corruption. *International Journal of Law and Policy*, 1(7), Artigo 7. <https://doi.org/10.59022/ijlp.119>

International Organization for Standardization. (2016). *ISO 15489-1:2016(en): Information and documentation: Records management: Part 1: Concepts and principles*. <https://www.iso.org/obp/ui/en/#iso:std:iso:15489:-1:ed 2:v1:en>

Jones-Evans, A. (1996). Data protection: Issues and implications for records managers in the UK. *Records Management Journal*, 6(1), 33–40. <https://doi.org/10.1108/eb027084>

Lowry, J. (2020). Data, information and records: exploring definitions and relationships. In A. Thurston (ed.), *A matter of trust: Building integrity into data, statistics and records to support the achievement of the sustainable development goals* (pp.49-66). University of London Press. <https://doi.org/10.14296/1220.9781912250356>

Marconi, M. A., & Lakatos, E. M. (2022). *Metodologia científica* [E-book]. Grupo GEN. <https://integrada.minhabiblioteca.com.br/#/books/9786559770670/>

Marconi, M. A., & Lakatos, E. M. (2023). *Fundamentos de metodologia científica* [E-book]. Grupo GEN. <https://integrada.minhabiblioteca.com.br/#/books/9788597026580/>

Marsh, M., Deserno, I., & Kynaston, D. (2005). Records managers in the global business environment: The role of the records manager has evolved over time along with the technologies used to collect, manage, and preserve records. *Information Management Journal*, 39(2), 30-36.

McDonald, J. (2020) The quality of data, statistics and records used to measure progress towards achieving the SDGs: A fictional situation analysis. In A. Thurston (Ed.). *A matter of trust: Building integrity into data, statistics and records to support the achievement of the sustainable development goals* (pp.211-242). University of London Press. <https://doi.org/10.14296/1220.9781912250356>

National Health Service. (2023, September 19). *Records management code of practice*. Transformation Directorate. <https://transform.england.nhs.uk/information-governance/guidance/records-management-code/>

Oliver, A. (2021). The impact of climate change on Canadian archives. *Records Management Journal*, 31(3), 284-302. <https://doi.org/10.1108/RMJ-10-2020-0035>

Pinto, M. M. (2013). Gestão de Documentos e meio digital: Um posicionamento urgente e estratégico. In R. de B. Cianconi, R. I. de N. Cordeiro, & C. H. Marcondes (Org.), *Gestão do conhecimento, da informação e de documentos em contextos informacionais* (pp.129-172). (Estudos da Informação, v. 3). Universidade Federal Fluminense.

Ross, A. (2009). Modern Interpretations of Sustainable Development. *Journal of Law and Society*, 36(1), 32-54.

Schwaitzer, L. (2020). LGPD e acervos históricos. *Archeion Online*, 8(2), 36-51. <https://doi.org/10.22478/ufpb.2318-6186.2020v8n2.57020>

Schwaitzer, L., Nascimento, N., & Costa, A. de S. (2021). Reflexões sobre a contribuição da gestão de documentos para programas de adequação à Lei Geral de Proteção de Dados Pessoais (LGPD). *Acervo*, 34(3), Article 3.

Sesana, E., Gagnon, A. S., Bertolin, C., & Hughes, J. (2018). Adapting cultural heritage to climate change risks: Perspectives of cultural heritage experts in Europe. *Geosciences*, 8(8), Article 8. <https://doi.org/10.3390/geosciences8080305>

Severino, A. J. (2017). *Metodologia do trabalho científico* [E-book]. Cortez. <https://integrada.mnhbiblioteca.com.br/#/books/9788524925207/>

Shepherd E., & McLeod, J. (2020). Information management for international development: roles, responsibilities and competencies. In A. Thurston (Ed.). *A matter of trust: Building integrity into data, statistics and records to support the achievement of the sustainable development goals* (pp.189-210). University of London Press. <https://doi.org/10.14296/1220.9781912250356>

Shepherd, E., & Yeo, G. (2003). *Managing records: A handbook of principles and practice*. Facet Publishing.

Tansey, E. (2015). Archival adaptation to climate change. *Sustainability: Science, practice and policy*, 11(2), 45-56. <https://doi.org/10.1080/15487733.2015.11908146>

Thurston, A. (2020). Records as evidence for measuring sustainable development in Africa. In A. Thurston (Ed.). *A matter of trust: Building integrity into data, statistics and records to support the achievement of the sustainable development goals* (pp.7-18). University of London Press. <https://doi.org/10.14296/1220.9781912250356>

United Nations. (n.d). *The 17 Goals*. <https://sdgs.un.org/goals>

United Nations. (2023, August 8). *Fast facts: What is sustainable development?* <https://www.un.org/sustainabledevelopment/blog/2023/08/what-is-sustainable-development/>

Part III

Information Behavior and

sustainability

Information Behaviour at ICBAS - School of Medicine and Biomedical Sciences: an approach to sustainable development in the business landscape

*Andreia Carvalho*¹

*Hélder Ferreira*²

*Inês Braga*³

ABSTRACT: The effective and efficient management of information is a fundamental aspect of organizational success, enabling the improvement of internal processes, the formulation of strategic decisions, and the rate of innovation while fostering continuous learning. Furthermore, sustainable development is becoming increasingly relevant in various sectors of society, particularly in business, as it aims at achieving a balance between economic growth, environmental preservation, and social well-being in the long run. Within this framework, the primary goal of this research is to address the issue of sustainable development to promote the adoption of environmentally friendly practices and to contribute to a more balanced and responsible future for the ICBAS - School of Medicine and Biomedical Sciences. The present study also analyses the role of information behaviour in supporting these aims, exploring how the acquisition, sharing, and use of

¹ Porto Accounting and Business School (ISCAP), Porto, Portugal.
E-mail: andreiafilipadecarvalho@gmail.com | ORCID iD <https://orcid.org/0009-0001-8326-7186>

² Porto Accounting and Business School (ISCAP), Porto, Portugal.
E-mail: helderflipferreira@gmail.com | ORCID iD <https://orcid.org/0009-0000-3154-3903>

³ Porto Accounting and Business School (ISCAP), Porto, Portugal.
E-mail: inesbraga@iscap.ipp.pt | ORCID iD <https://orcid.org/0000-0001-5278-9363>

<https://doi.org/10.36311/2025.978-65-5954-624-4.p231-262>

information lead to sustainable practices. The methodology employed is a case study, while the data collection technique is a survey conducted among employees of different hierarchical levels within ICBAS. Finally, this same study infers the conclusion that implementing efficient information management and positive information behaviour can lead to a reduction in the consumption of natural resources, including a decrease in the usage of paper and other materials, and process optimisation, which in turn can result in energy waste reduction. Furthermore, a collaborative approach between employees can be encouraged within the frame of a culture of knowledge sharing, promoting thus more sustainable practices, and support social and environmental responsibility initiatives.

KEYWORDS: Information Management, Information Behaviour, Sustainable Development, Environmental Practices, Social Responsibility

INTRODUCTION

In the contemporary business environment, a pervasive issue affects all organisations: the lack of effective information management. This is a crucial aspect of organisational success, yet it needs to be noticed and is frequently overlooked and not a priority for managers in any organisational context. Another problematic situation is the widespread absence of practices related to sustainable development, which have clear benefits in the business sphere. In light of the numerous challenges currently facing companies, there is a pressing need to line up operational strategies with sustainable practices.

Indeed, effective information management is widely acknowledged as a fundamental key point for organisational success, playing a crucial role in optimising internal processes, formulating strategic decisions, and fostering innovation and continuous learning. Moreover, an understanding of how individuals seek, use, and share information is equally critical. In the context of a global scenario that is increasingly focused on finding a balance between economic growth, environmental preservation, and long-term social well-being, the implementation of best practices in both areas assumes even greater significance.

In the present research, these issues are theoretically framed and addressed in an empirical case study of Instituto de Ciências Biomédicas Abel Salazar ICBAS-UP, School of Medicine and Biomedical Sciences of the University of Porto, which is not exempt from the problematic

organisational scenario described above. This educational and research institution, which has a crucial role in the training of professionals and the generation of knowledge, aims to fulfil its mission sustainably, to impact not only the academic community but also the wider environment and society.

Considering the issues, the overarching objective of this investigation is to examine the implementation of sustainable development at ICBAS, with the main focus on both information management and information behaviour. Consequently, we aim to ascertain whether institutional growth is accompanied by sustainable practices, ensuring that excellence aligns with ecological and social well-being in the context of the rapidly evolving business landscape.

Given that ICBAS – a reference institution in the health sector – has the potential for beneficial changes, this study aims to contribute suggestions that can improve both information management and sustainable growth. By understanding and enhancing how information is managed and how individuals interact with information, we can foster a culture of knowledge by sharing its promotion of sustainable practices and supporting social and environmental responsibility initiatives.

The research is based on a methodology survey to examine the challenges experienced by this institution in its sustainability efforts. This underscores the importance of balancing institutional growth with sustainable practices, ensuring that excellence lines up with ecological and social well-being in today's increasingly evolving business environment. A survey was administered to a sample of sixty ICBAS employees from different hierarchical levels to obtain a deeper understanding of their perspectives and information behaviour concerning the sustainability challenges faced by the institution. The aim of this approach allows a comprehensive analysis of how information behaviour influences and supports the adoption of sustainable practices within the organisation.

LITERATURE REVIEW

Regarding the importance of theoretical support for academic research, we start by contextualising sustainability, a broad topic that requires good information management and adequate information behaviour on the part of different types of information system users. It is widely acknowledged that information resources play a central role in navigating the complexities of contemporary business.

In this context, it becomes evident that an approach based on accurate and reliable information is fundamental both to understand and address the complex challenges associated with sustainability. Effective information management and appropriate information behaviour play an important function in enabling different stakeholders to access relevant information, critically evaluate it, and make informed decisions.

Finally, the view of several authors, who argue that the synergy between information effectiveness and sustainable development is not only possible but also crucial for the sustainable progress of institutions, is also shared. This alignment enables organizations to formulate and execute policies, strategies, and practices that foster sustainability across diverse organisational environments. By lining up goals aimed at informational efficiency with the principles of sustainability, organizations can not only mitigate costs and risks, but also cultivate long-term value for stakeholders, compromising employees, customers, communities, as well as the environment.

SUSTAINABILITY

A wide range of research has been conducted to explore and outline the concept of sustainability. However, a significant proportion of these studies have been constrained in their interpretation of the concept, while others have expressed that its essence can only be made clear by examining numerous interconnected dimensions that collectively constitute its meaning (Kotob, 2011, p.2). Sarkis et al. (2001) observed that the existing literature on operation management tends to consider sustainability from

an ecological perspective, without incorporating its social aspects. This perspective is of great importance, as it enables a clear understanding of the limitations of the traditional approach to operational sustainability. Carter and Rogers (2008) propose that sustainability should be analysed not only in its economic, social, and environmental dimensions, but also by integrating business elements such as risk management, transparency, strategy, and culture. Thus, a more holistic and comprehensive view is provided.

The Brundtland Commission (1987) defined sustainability as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs.” Established in 1983, the World Commission on Environment and Development (WCED) was tasked with addressing global environmental challenges and later became known for this influential definition of sustainable development. This concept prioritises meeting the basic needs of the world’s poorest populations, while recognising the environmental limits imposed by technology and social conditions. It calls for a balance between economic and social progress, focusing on the fair distribution of resources and intergenerational equity, ensuring that the benefits of development are accessible to all without compromising future capabilities.

In this context, Rahman et al. (2022) emphasise that the term “sustainability” encompasses a wide and often ambiguous range of concepts, touching on socioeconomic and environmental dimensions. They highlight that organisational sustainability has become a critical consideration for modern businesses in current discussions about effective development and long-term viability.

While organisations have expanded their capacity to address sustainability issues, the above mentioned authors caution against assuming that sustainability is always a top priority, especially during economic downturns.

In essence, sustainability is the capacity to maintain a process over an extended period. Within the frame of business and policy, the overarching aim of sustainability is to mitigate the depletion of natural or physical resources, ensuring their long-term availability. These sustainability efforts are commonly categorised in three pillars: environmental, social,

and economical. The environmental aspect of sustainability concerns the impact of a business on the environment, emphasising responsible resource usage, pollution reduction, and conservation efforts. The social pillar of sustainability pertains to the societal effects of a business, encompassing considerations such as community welfare, labour practices, and the promotion of social equality. Finally, the economic pillar of sustainability emphasises the preservation of natural resources—both renewable and exhaustible—that serve as vital input for economic production.

By clarifying these three pillars, the concept of sustainability provides a comprehensive framework for companies, enabling them the ability to manage their environmental, social and economic responsibilities, promoting a harmonious and sustainable approach to their operations.

INFORMATION MANAGEMENT AND INFORMATION BEHAVIOUR

Effective information management and understanding information behaviour are crucial aspects of organisational success. Information management involves the organisation, control and optimisation of the access, besides the usage and dissemination of information within an organisation. It encompasses a range of processes related to the effective collection, storage, processing, retrieval and dissemination of data to support operational activities and decision-making. In their 2016 publication, Laudon and Laudon (2016) define information management as “a set of processes, activities, methods, and policies designed to provide an organization with the information it needs to achieve its objectives.”

Expanding on this perspective, Ravi (2011) emphasises the crucial role of integrating technological innovations and strategic processes into effective information management. He argues that this integration not only ensures data protection and regulatory compliance, but also aligns information management efforts with organisational objectives. By taking advantage of information technologies and related tools, organisations can effectively generate, organise, store and disseminate information to relevant stakeholders, ultimately optimising the use of resources and improving overall operating result.

Davenport & Beers (1995) argue that effective information management requires a convergence of people, processes, and technology. This convergence includes implementing the appropriate tools and systems, as well as establishing policies and procedures to regulate the usage and dissemination of information. The effective management of information facilitates improvements in decision-making, productivity, and the competitive advantage of organisations in the current data-driven business environment. With the framework of professional context, identifying information needed to address both internal and external requirements is paramount. Nevertheless, information management alone is not sufficient. Understanding information behaviour - how individuals seek, use, and share information - is equally important.

Information behaviour refers to the conduct that individuals adopt in the realm of information. Tom Wilson (1999) presents a theoretical conceptualization that enables the understanding of users' information-seeking behaviour in a digital framework, linking it to patterns of human information behaviour. The existence of search engines and information retrieval systems is vital, as they assist users in locating relevant information. It is of the utmost importance to assess the quality and reliability of the information obtained, particularly in a digital environment where information can be easily altered and diffused (Wilson, 1999).

Gasque and Costa (2010) define information behaviour as encompassing all human behaviours related to information, including research, usage of both sources and information channels. Davenport and Prusak (1998) define information behaviour as a set of actions, including research, application, modification, exchange, and storage of information. Casarini and Oliveira (2012) add that information behaviour pertains to how one deals with information, encompassing its own methods of research and usage.

Connecting these concepts, effective information management must consider and support information behaviour within the organization. An understanding of how employees use and share information is crucial for the design of systems and processes that facilitate better information flow and usage. Information behaviour informs the development of document

management systems, knowledge bases, guidelines for information sharing, and collaborative technologies.

Choo (1998) notes that information sources can be both formal and informal. Formal sources include databases, scientific journals, institutional reports, standards, and regulations. Informal sources encompass networks of contacts, electronic messages, informal knowledge exchanges, and information obtained through everyday interactions, social networks, and other similar avenues.

To optimise information management practices, it is essential to identify and comprehend the information produced and received by the institution. This encompasses a vast array of documents, including internal documents, project reports, memoranda, emails, and announcements. An understanding of the nature and content of this information enables the implementation of appropriate management strategies.

Aligning information management with information behaviour is crucial for organisations to effectively meet their needs. By optimising the production, storage, and sharing of information, organisations can enhance knowledge sharing, improve operational efficiency, and support sustainable practices.

INFORMATION MANAGEMENT AND INFORMATION BEHAVIOUR: KEY ELEMENTS FOR ORGANIZATIONAL SUCCESS AND SUSTAINABILITY

Effective information management and understanding of information behaviour are fundamental for organizational success. Information management involves organizing, controlling, and optimizing the access, use, and dissemination of information within an organization. It encompasses processes such as collection, storage, processing, retrieval, and dissemination of data to support operational activities and decision-making (Laudon & Laudon, 2016; Ravi, 2011). This paper explores the integration of these concepts and their alignment with sustainability practices, emphasising their synergistic effect on organizational efficiency and long-term viability.

According to Laudon and Laudon (2016), information management comprises a set of processes, activities, methods, and policies designed to provide organizations with the necessary information to achieve their objectives. It encompasses the entire lifecycle of data within an organization, facilitating strategic decisions and operational efficiency through technological integration (Ravi, 2011). Effective information management requires a convergence of people, processes, and technology, supported by appropriate tools and policies to regulate information utilisation and dissemination (Davenport & Beers, 1995).

Understanding information behaviour is equally crucial as it dictates how individuals manage information within organizational contexts. Wilson (1999) provides a theoretical framework for digital information-seeking behaviour, highlighting the importance of information retrieval systems in facilitating access to reliable information. Information behaviour encompasses a spectrum of activities, from formal research to informal knowledge exchanges, influenced by organizational culture and contextual factors (Davenport & Prusak, 1998; Gasque & Costa, 2010; Casarini & Oliveira, 2012).

Organizational sustainability, encompassing environmental, social, and economic dimensions (Mollenkamp, 2023), requires the effective management of information and alignment with sustainable practices. Sustainable organizational development theories emphasize how organizational culture and practices impact sustainability outcomes (Mollenkamp, 2023). Information management systems that integrate sustainability principles not only optimise resource utilisation but also enhance operational efficiency and contribute to broader environmental and social goals.

The integration of information management and information behaviour with sustainability practices offers a synergistic approach for contemporary organizations. By aligning information management strategies with the behaviour of individuals, organizations can foster a culture of knowledge sharing and responsible information usage (Scott, 1998). This integrated approach ensures organizations are well-equipped to navigate

the complexities of a data-driven business environment while promoting sustainable and responsible development (Androniceanu, 2012).

The alignment of information management with information behaviour and sustainability practices is essential for organizational success and longevity. By understanding how individuals interact with information and integrating sustainable principles into information management strategies, organizations can enhance their operational efficiency, support environmental stewardship, and fulfil social responsibilities. This holistic approach not only optimizes resource use, but also prepares organizations to thrive in an increasingly dynamic global landscape.

METHODOLOGY

The research aims were formulated in response to the identification of flaws in information management and sustainable development practices at ICBAS. The general goal is to explore the implementation of sustainable development principles at ICBAS, particularly focusing on its informational dimensions. The specific objectives are twofold: firstly, to analyse the information behaviour of ICBAS employees; and secondly, to identify areas of improvement, thereby proposing strategic interventions geared towards fostering a more efficient and sustainable informational ecosystem within the institution.

The research uses a survey methodology well suited to collect quantitative data from a large group of participants in a relatively short period. Surveys are an effective means of collecting self-reported data on attitudes, behaviours and practices, providing a snapshot of the current state of information management and sustainability efforts within the institution.

To ensure a comprehensive understanding of information behaviour, employees from various hierarchical levels were included in this study. The different roles and responsibilities of employees within an organization influence the way information is received and managed. By surveying employees at various levels, insights can be gained into information

behaviour throughout the institution's hierarchy. This inclusive approach also enables an examination of how organisational culture shapes information management and its alignment with sustainability objectives. By surveying employees at different hierarchical levels, communication gaps, specific challenges in certain functions and areas for improvement can be identified.

To sum up, the survey methodology offers a comprehensive analysis of information behaviour at ICBAS, elucidating the way information is managed and utilised within the institution. The survey was designed to address a spectrum of relevant topics, including information transmission, digital transition, data sharing, support channels, and the implementation of eco-friendly measures. This data collection technique aims not only at qualifying patterns and trends, but also at uncovering qualitative insights that could remain hidden in a purely quantitative analysis.

The research was conducted between January and June 2023 and its aim is to contribute to the development of solutions aligned with institutional growth and sustainable practices through the analysis of the information behaviour of the collaborators of ICBAS.

CONTEXT OF THE STUDY

The School of Medicine and Biomedical Sciences (ICBAS) is the focal institution of this study, and it is essential to contextualise its journey from its inception to the present day. Established in 1975, ICBAS stands as a cornerstone of higher education in Portugal, with a strong commitment to training professionals in the biomedical sciences and health fields, significantly contributing to the country's scientific and technological progress. Its mission highlights the critical role of up-to-date and high-quality scientific information in fulfilling its informational needs and practices, alongside the effective management of data and information generated by its researchers and students (ICBAS, 2020).

ICBAS is part of the University of Porto, a renowned biomedical teaching and research institution encompassing fields such as biology,

health, environmental studies, and animal life. In recent times, ICBAS has embraced the concept of ‘One Health’, which emphasises the interconnectedness of human, animal and environmental health. This demonstrates the institution’s commitment to holistic approaches in addressing contemporary health challenges.

At its core, ICBAS is dedicated to nurturing a cadre of highly skilled professionals, advancing scientific knowledge, and fostering community health and well-being. The institution actively diffuses its research findings through academic publications and participation in conferences, underscoring its commitment to knowledge exchange and promulgation.

In recent years, ICBAS has made significant progress towards the improvement of its sustainability practices beyond traditional academic activities. In recognition of the importance of environmental protection and social responsibility, the institution has initiated various programmes to reduce its environmental impact and engage with the community. These efforts include implementing recycling programmes, adopting energy-efficient measures, supporting student-led sustainability projects, and organising community outreach events. By integrating sustainability into its core operations and promoting environmental awareness, ICBAS not only fulfils its educational mission, but also sets an example of sustainable leadership within and beyond the academic sphere.

While institutions such as ICBAS play an instrumental role in training professionals and generating knowledge, they also face the formidable challenge of conducting operations sustainably. This dual role places them at the intersection of knowledge advances and societal stewardship, impacting not only the academic community but also the broader environment and society. Nonetheless, with a focus on excellence, innovation and social responsibility, ICBAS strives to excel in teaching, researching, and servicing provision in the fields of life and health sciences.

ICBAS’s vision extends beyond the boundaries of academic pursuits, intending to become a leader in its fields through strategic collaborations, research promotion, and the cultivation of open communication, teamwork, and interdisciplinary collaboration. Aligned with its core values of ethics,

integrity, and inclusivity, ICBAS is deeply committed to social responsibility (ICBAS, 2020), actively engaging with the community, promoting scientific diffusion, and fostering a culture of citizenship. This commitment not only enables innovation and continuous learning but also upholds the institution's long-standing reputation for academic excellence and societal impact.

FINDINGS

This study analyses the responses of 60 employees at ICBAS, offering insights into their demographic profiles, work environment, organizational culture, and sustainability practices. The hierarchical structure of ICBAS encompasses several levels, with technical and administrative staff responsible for operational support and administrative tasks. Teachers occupy a pivotal role in academic instruction, curriculum development, and research. Middle managers are responsible for overseeing departments and functional areas, ensuring that these are coordinated and aligned with the institution's goals. Department heads are responsible for leading academic and administrative units, with the mandate to shape strategic directions and policies. The school headmaster is responsible for providing overall leadership and guiding the institution's mission and vision. Researchers at ICBAS are engaged in scientific inquiry and contribute to the advancement of knowledge in biomedical sciences and related fields.

In terms of tenure, 78% (n=47) of staff have been with ICBAS for over a decade, indicating a mature and potentially influential team. This extensive experience is likely to shape the organisational culture and knowledge transfer dynamics within the institution. This positive view reflects ICBAS's adaptability to technological advancements.

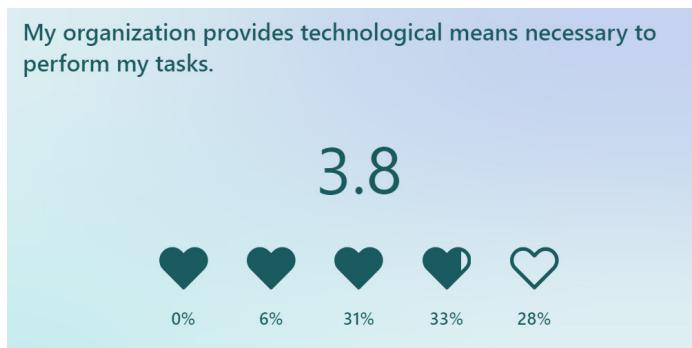
In terms of satisfaction with technology, employees rated their satisfaction on a Likert scale from 1 to 5, where 1 represents strong disagreement and 5 strong agreements. The satisfaction rate was 3.8, indicating a generally positive attitude towards technologies used in their professional context (see Figure 1). It is important to note, however, that this average reflects favourable attitudes rather than satisfaction.

It is important to note that the distinction between attitude and satisfaction is crucial in this context. While the average score indicates a positive overall attitude towards technology, it does not in any way imply satisfaction. Further research into specific aspects of technology usage and feedback from employees could provide deeper insights into problematic areas that affect satisfaction.

The study also assessed organizational culture and sustainability practices, with the aim of pinpointing areas for improvement and proposing strategic interventions to foster a more efficient and sustainable information ecosystem at ICBAS. This comprehensive approach illuminates information on behaviour patterns, specific challenges, and potential avenues for enhancement within the institution.

In conclusion, this study provides a comprehensive analysis of information behaviour and sustainability practices at ICBAS, offering insights into how information is managed within the institution. These findings contribute to a deeper understanding of organizational dynamics and inform strategies for enhancing operational efficiency and sustainable development initiatives.

Figure 1: Satisfaction with the technology provided by the organization.

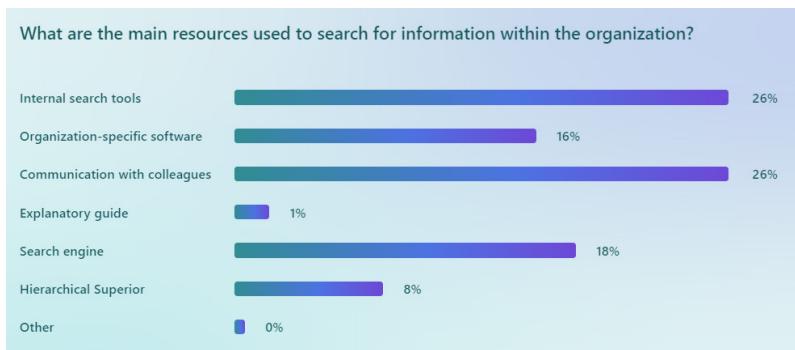


An understanding of how information is managed within an institution provides valuable insights into potential areas for improving

information behaviour. It helps identify patterns, specific challenges, and potential avenues for enhancement.

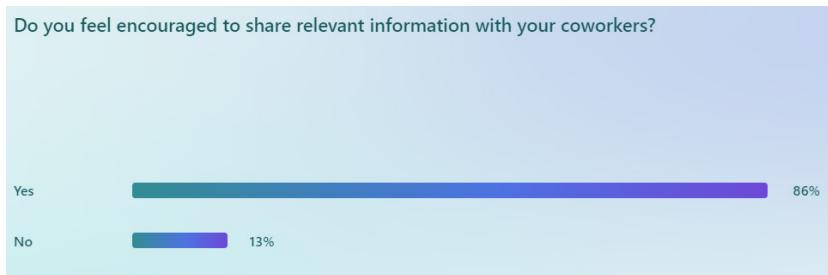
Regarding the primary sources of information within the organisation, the study found that the two most frequently used by employees are colleagues and internal research tools, accounting for a combined usage of 26%. Additionally, search engines and organisation-specific software were identified as significant sources of information, with 18% and 16% of respondents, respectively, citing these as their most frequently used resources. Furthermore, in addition to consulting colleagues, which was preferred by a significant proportion of respondents (80%), employees also occasionally turn to their hierarchical superiors for information (8%). Combining these percentages highlights that a notable proportion of respondents prefer personal sources when performing their professional tasks. Figure 2 provides a visual representation of these findings.

Figure 2: Primary Sources of Information Within the Organization.



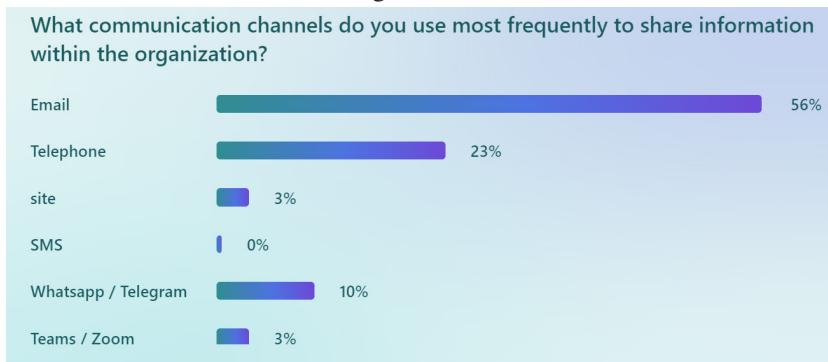
Furthermore, a significant proportion of respondents, reaching (86%), reported a high level of comfort in sharing relevant information which indicates a deeply ingrained collaborative culture within the organization (see Figure 3). This inclination towards sharing information suggests a positive atmosphere of teamwork and knowledge exchange, which enhances innovation and problem-solving capabilities across various departments.

Figure 3: Encouraging to share relevant information.



Furthermore, the pervasive use of communication channels such as email, favoured by 56% of users, illuminates the communication preferences within the institution. This inclination towards written communication is further substantiated by the comparatively lower percentages of respondents indicating the use of telephone communication (23%) and messaging apps like WhatsApp or Telegram (10%). These findings indicate that social networks are still underused in professional contexts (see Figure 4).

Figure 4: Communication Channels for Sharing Information Within the Organization.



The results display the satisfaction rate regarding the organisational culture at ICBAS is 3.4 on a Likert scale ranging from 1 (very dissatisfied) to 5 (very satisfied) (Figure 5). This score suggests that employees generally

have a positive perception of the organisational culture. Although this score is slightly above the midpoint of the scale (which is 3.0), it also indicates that there is room for improvement within the organisational culture, as the average satisfaction does not reach higher levels (4 or 5).

This finding indicates that while a significant proportion of employees perceive the organisational culture in a positive light, there are still aspects that may not fully align with their expectations or needs. To gain a more comprehensive understanding of these aspects, further qualitative research, such as interviews or focus groups, could be carried out. Such methodologies would enable researchers to investigate specific issues or concerns that may be contributing to the slightly lower satisfaction score observed in the survey. The identification of these factors could provide valuable insight for leadership and management, propelling the implementation of targeted initiatives to enhance employee satisfaction and improve the overall organisational culture at ICBAS.

Figure 5 - Satisfaction with company culture.

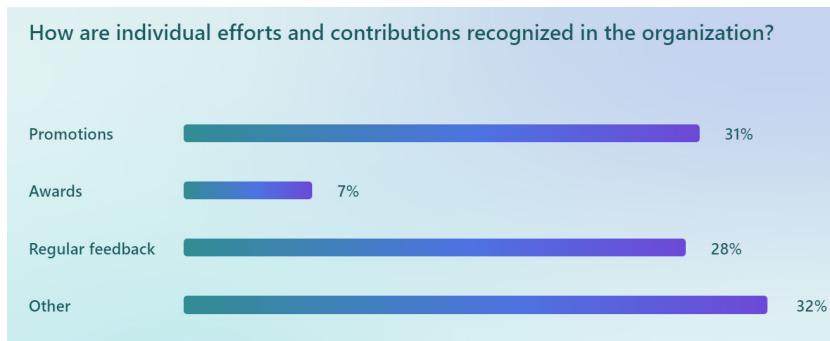


Concerning acknowledging individual contributions within the organisation, the data reveal a diversity of perspectives and preferences. The findings indicate that 31% of respondents consider promotions to be the primary means of recognition, suggesting that career progression is structured. Another notable proportion, comprising 28% of respondents,

places significant emphasis on the importance of regular feedback as an essential factor for both personal and professional development. Furthermore, 32% of respondents identified alternative forms of recognition.

These findings emphasise the necessity of adopting a multifaceted approach to recognising individual contributions within the organisation. While a substantial number of respondents value promotions for their role in career progression, others prioritize regular feedback as crucial for continuous growth. Furthermore, the endorsement of alternative forms of recognition by a notable proportion of participants highlights the necessity of diverse strategies to effectively appreciate employees' efforts. The diversity of perspectives highlighted in the findings serves to emphasise the importance of implementing flexible and comprehensive recognition policies. Such policies can better accommodate the diverse needs and expectations of staff members, thereby fostering a supportive and motivating work environment at ICBAS.

Figure 6: Recognition of Individual Contributions Within the Organization.



In terms of sustainability, it is important to note that 73% of respondents are aware of initiatives implemented by the organization to reduce environmental impact, such as energy efficiency, waste management or the use of sustainable materials, to reduce negative environmental

impact, which means that, in general, this type of institutional information is disclosed and that people pay attention to these issues.

Figure 7: Awareness of initiatives to reduce negative environmental impact.



The frequency with which information on sustainable practices is disseminated appears to be inadequate. Most respondents (41%) indicated that they receive this information on a sporadic basis, while 25% stated that they receive it with some regularity and only a minority (34%) reported that they receive it with great frequency (Figure 8).

Figure 8: Reception of Information about Organizational Sustainability Initiatives.



Regarding the actions taken by the organisation to promote sustainability, the employees most frequently cited efforts to reduce paper

consumption (50%) and adapt work practices to consider environmental impact (22%) (Figure 9). This emphasis on reducing paper consumption is consistent with the organisation's broader objective of transitioning towards digital practices and minimizing its environmental footprint.

Figure 9: Actions implemented by the organization in favour of sustainability.



The results of the survey on the training provided by organisations on the responsible use of information for sustainability revealed a diverse range of responses that require careful interpretation. The collected data indicates that a considerable proportion of respondents (26%) stated that such training is never provided by the organisation, while another 35% reported that training sessions are only occasionally provided. A mere 13% of respondents indicated that they received this training regularly (Figure 10).

This variability in responses suggests the potential influence of several factors. Firstly, there may be issues related to communication and awareness within the organisation. It is possible that employees who indicated that they had never received training may have not been informed about its availability or may not perceive it as a priority in their role. Secondly, the discrepancy in responses may be indicative of targeted training initiatives. It seems reasonable to posit that some departments or groups within the organisation receive regular training sessions, while others do not. Such a targeted approach could result in disparate perceptions and experiences among employees regarding the frequency of training.

Moreover, the interpretation of the term “regular” training may differ among respondents. Some employees may consider training sessions that occur less frequently to be regular, while others may expect more frequent and consistent training opportunities. This discrepancy in perception may contribute to the disparate responses observed in the survey.

Figure 10: Availability of Training on Responsible Information Use for Sustainability.



In essence, the in-depth analysis of the questionnaire results provides valuable insights into the dynamics of the workplace at ICBAS. While the institution’s strengths, such as its educational diversity and adaptability to digital technologies are evident, there is a need to improve communication around sustainable initiatives and strengthen data handling practices to foster a collaborative and sustainable working environment. By addressing these and other identified areas, we can make a significant contribution to the long-term success and positive impact of ICBAS.

DISCUSSION

The research conducted at ICBAS provides valuable insights into the way individuals interact with and use information within the institution. This is consistent with the perspectives of various authors who emphasise the vital relationship between effective information management and sustainable development. The findings indicate that employees benefit

from awareness about the impact of digital technologies on work efficiency, following the insights presented in the literature review. Furthermore, the reasonable satisfaction expressed with the technological resources provided by the organisation suggests that these tools adequately support the employees' tasks.

The prevalence of colleagues and internal research tools as the most searched sources of information within the organisation reflects a balanced reliance on both informal and formal channels, a trend observed across various professional domains such as healthcare, engineering, and law. This indicates a culture of collaboration and timely information sharing within ICBAS, which facilitates efficient knowledge exchange and updates across services.

The management of multiple communication channels serves to reinforce the notion that the organizational culture is characterised by a commitment to the collaboration and the dissemination of information. This not only facilitates effective idea exchange but also indicates a commitment to fostering open dialogue and teamwork. However, the sporadic communication regarding sustainability initiatives among employees indicates a significant area for improvement. This discrepancy underscores the imperative for the implementation of enhanced and consistent communication strategies, to ensure that all members are adequately informed and engaged in environmentally responsible practices.

In terms of sustainability, it is encouraging that most respondents are aware of ICBAS's initiatives aimed at reducing environmental impacts. Nevertheless, there is a clear recommendation for the broader diffusion of this information to all employees, which could potentially enhance the effectiveness of implementation. This high level of awareness reflects a collective dedication to environmental stewardship and provides a solid foundation for future sustainability initiatives within the organization. The institution's proactive sustainability measures demonstrate commendable efforts to reduce the environmental footprint of the organisation and to uphold environmental responsibility. These initiatives not only demonstrate a forward-thinking approach but also contribute to broader sustainability goals, aligning with societal expectations and organisational values.

Despite the encouraging findings, the study indicates that training on the responsible use of information for sustainability is provided with less frequency than desired, which presents challenges to the adoption of appropriate behaviours in this realm. The implementation of comprehensive training programmes that integrate transparency in data management and sustainability principles could serve to enhance organisational culture towards environmental and ethical responsibility significantly, thereby addressing the gap.

Furthermore, in response to the comment regarding information behaviour, it is recommended that future research and organisational efforts should explore and enhance it across all operational aspects far more comprehensively. This holistic approach will further optimise organizational effectiveness, sustainability, and overall employee engagement. By integrating these principles, organizations such as ICBAS can foster a collaborative and sustainable work environment conducive to long-term success and positive societal impact.

CONCLUSION

To sum up, this study illuminates the crucial intersection of information management, information behaviour, and sustainability within ICBAS, offering profound insights into organizational development and environmental responsibility. Effective information management is not only crucial for enhancing internal processes and promoting eco-efficiency but also plays a fundamental role in advancing social responsibility within educational and research institutions. By optimizing information-sharing practices, institutions such as ICBAS can streamline operations, reduce resource consumption, and foster a collaborative culture conducive to innovation.

Furthermore, the study emphasises the strategic importance of information management by meeting the specific demands of biomedical sciences and driving scientific and technological progress. Investments in efficient data management not only support organizational growth but also cultivate skilled professionals capable of navigating complex scientific landscapes.

To enhance information processes and cultivate a sustainable culture at ICBAS, several key recommendations are proposed. Firstly, the implementation of state-of-the-art digital tools, document management systems, and collaborative platforms will enhance the efficacy of information handling and sharing, thereby reinforcing the digital transition. This necessitates the integration of technology into the daily workflows of employees and the provision of essential digital skills.

Secondly, the establishment of a culture of continuous learning and knowledge sharing is of paramount importance. The implementation of team training programmes, interactive workshops and online platforms can facilitate the exchange of information and expertise across departments, thereby enhancing organisational agility and responsiveness.

Lastly, educational initiatives that emphasize sustainable practices are of crucial relevance for the enhancing of employee awareness and engagement in sustainability initiatives. This comprehensive approach not only serves to advance environmental objectives but also aligns organisational practices with societal expectations and educational missions.

REFERENCES

Androniceanu, Armenia; Drăgulănescu, Irina-Virginia (2012): Sustainability of the Organizational Changes in the Context of Global Economic Crisis, *Amfiteatru Economic Journal*, ISSN 2247-9104, The Bucharest University of Economic Studies, Bucharest, Vol. 14, Iss. 32, pp. 365-379

Brundtland, G. (1987). *Report of the World Commission on environment and development: Our common future*. United Nations General Assembly document A/42/427.

Carter, C., & Rogers, D. (2008). A framework of sustainable supply chain management: moving toward new theory. *International Journal of Physical Distribution & Logistics Management*, 38(5), 360-387.

Casarin, H. C. S., & Oliveira, E. S. (2012). O uso da informação no âmbito acadêmico: o comportamento informacional de pós-graduandos da área de educação. *Encontros Bibli: Revista eletrônica de Biblioteconomia e Ciência Da Informação*, 12(nesp.1)169-187. <https://doi.org/10.5007/1518-2924.2012v17nsp1p169>

Choo, C. W. (1998). *Information management for the intelligent organization: The art of scanning the environment*. American Society for Information Science by Information Today.

Davenport, T. H., & Beers, M. C. (1995). Managing information about processes. *Journal of Management Information Systems*, 12(1), 57-80. <https://doi.org/10.1080/07421222.1995.11518070>

Davenport, T., & Prusak, L. (1998). *Working knowledge: How organizations manage what they know* (v.1). In Ubiquity.

Gasque, K. C. G. D., & Costa, S. M. de S. (2010). Evolução teórico-metodológica dos estudos de comportamento informacional de usuários. *Ciência Da Informação*, 39(1), 21-32. <https://doi.org/10.1590/S0100-19652010000100002>

Instituto de Ciências Biomédicas Abel Salazar (n.d.). ICBAS e FFUP unem-se para divulgar os ODS. https://sigarra.up.pt/icbas/pt/noticias_geral.ver_noticia?P_nr=49469

Instituto de Ciências Biomédicas Abel Salazar. (2020). *ICBAS: Uma escola, uma saúde*. https://sigarra.up.pt/icbas/pt/web_base.gera_pagina?P_pagina=1182

Kotob, F. (2011). *What is sustainability?* https://www.researchgate.net/profile/Fadi-Kotob/publication/282184670_What_Is_Sustainability/links/5606b3ac08aeb5718ff6254f/What-Is-Sustainability.pdf

Laudon, K. C., & Laudon, J. P. (2016). *Management information system*. Pearson India.

Mollenkamp, D.T. (2023), "What is sustainability? How sustainabilities work, benefits, and example", Investopedia, available at: www.investopedia.com/terms/s/sustainability.asp#:~:text=Key%20Takeaways,environmental%20footprints%20and%20conserving%20resources

Rahman, M., Abd Wahab, D. S., & Abdul Latiff, D. A. S. (2022). Definitions and concepts of organizational sustainability: A literature analysis. *Society & Sustainability*, 4(2), 21–32. <https://doi.org/10.38157/ss.v4i2.496>

Ravi, T. M. (2011). *The Path to Information Management Nirvana*. Information Management Daily.

Sarkis, J. (2001). Manufacturing's role in corporate environmental sustainability. *International Journal of Operations & Production Management*, 21, 666–686. <https://doi.org/10.1108/01443570110390390>

Scott, W. (1998). Organizations: rational, natural and open systems. *Canadian Journal of Sociology: Cahiers Canadiens de Sociologie*, 29.

Wilson, T. D. (1999). Models in information behaviour research. *Journal of Documentation*, 55(3), 249–270. <https://doi.org/10.1108/EUM0000000007145/FULL/XML>

Appendix

SURVEY ON INFORMATION PRACTICES IN THE ORGANIZATIONAL CONTEXT

This survey is part of the curricular unit Information Practices in the Organizational Context, which is part of the master's degree in business information, taught at the Instituto Superior de Contabilidade e Administração do Porto, of the Instituto Politécnico do Porto. The study aims to gather the perspectives of the organization's employees regarding information management in their day-to-day work, including methods of research, sharing, evaluation and use of information. In addition, the study aims to understand the organizational culture about information sharing, internal communication, collaboration, innovation, continuous learning, performance management and employee recognition, and the company's approach to sustainability.

Your participation in this study is very important and will make a fundamental contribution to the completion of this case study. The time required to complete the questionnaire is approximately 2 minutes. Participation in this study is voluntary and we undertake to safeguard the interests of the participants, ensuring strict confidentiality and anonymity of the information collected, revealing our full availability for any intervention considered useful. If you have any questions or concerns while filling out the form, please send an email to hfferreira@icbas.up.pt. We would like to thank you in advance for your availability and collaboration!

PERSONAL DATA

1. Sex

- Male
- Female
- Other
- I rather not to answer

2. Age range

- 18-24
- 25-34
- 35-44
- 45-60
- +60

3. Level of Education

- Secondary Education
- Bachelor's degree
- Graduation
- Master's degree
- Doctorate

4. How many years have you worked at your current organization?

- <1 year
- 1-3 years
- 4-6 years
- 7-10 years
- >10 years

INFORMATION BEHAVIOUR

5. What are the main resources used to search for information within the organization? (multiple choice)

- Internal search tools
- Organization specific software
- Communication with colleagues
- Explanatory guide
- Search Engine
- Hierarchical Superior
- Other

6. How often do you use the resources (previously specified) to carry out your daily tasks?

- Daily
- Weekly
- Monthly
- Rarely

7. Do you feel encouraged to share relevant information with your coworkers?

- yes
- no

8. How do you evaluate the effectiveness of internal communication channels for sharing information within the organization?

- Very ineffective ☹☺☺☺☺ very effective

9. What communication channels do you use most frequently to share information within the organization? (select a maximum of 2 options)

- Email
- Telephone
- Website
- SMS
- Whatsapp / Telegram
- Teams / Zoom
- Other

INFORMATION PRACTICES

10. Do you consider that digital technologies have been implemented with the aim of improving information management?

- Yes
- No
- I don't Know

11. What was the most significant change in the transition from physical to digital media?

- Practicality in storing and accessing information
- Communication and collaboration
- Task automation
- Mobility and flexibility

ORGANIZATIONAL CULTURE

12. How would you describe the organization's culture when it comes to innovation and collaboration?

- Open
- Neutral
- Resistant
- Conservative

13. My organization provides technological means necessary to perform my tasks.

- I totally disagree  I totally agree

14. How satisfied are you with the organization's promotion of continuous learning?

- Very dissatisfied  Very satisfied

15. How does the organization promote continuous learning among employees?

- Training actions
- Paid external training
- Other methods
- None

16. What strategy(ies) do you believe are most effective in promoting and maintaining a work environment where mutual trust between management and employees is cultivated and there is room for productive collaboration?

- Select all that apply:
- Regular feedback and evaluation sessions for all hierarchical levels.
- Mentoring and coaching programs for professional development.
- Participation of employees in strategic company decisions.
- Transparent communication about goals, challenges and organizational changes.
- Events or activities that promote integration and teamwork.
- Offering benefits and programs aimed at employee well-being.
- Initiatives that recognize and reward employee performance and contributions.

17. How satisfied are you with the company culture?

- Very dissatisfied ☹☺☺☺☺ Very satisfied

18. How are individual efforts and contributions recognized in the organization?

- Multiple choice.
- Promotions
- Awards
- Regular feedback

MEASURES TO MITIGATE THE IMPACTS OF INFORMATION MANAGEMENT ON SUSTAINABILITY

19. Are you aware of the initiatives implemented by the organization to reduce environmental impact, such as energy efficiency, waste management or the use of sustainable materials?

- Yes
- No

20. Actions implemented by the organization in favor of sustainability ?

- Reduction of paper documents
- Consolidation of databases in a centralized environment
- Adaptation of work methods that include concerns about environmental impact
- No Action

21. How often do you receive information about the organization's sustainability initiatives ?

- It is necessary to answer. Single choice.
- Regularly
- Occasionally
- Rarely
- Never

22. Are you aware of recycling programs for obsolete electronic equipment in your organization?

- It is necessary to answer. Single choice.
- Yes, I am aware
- I know, but with few details
- I have no knowledge

23. Does the organization provide platforms to access information on sustainable practices?

- It is necessary to answer. Single choice.
- Regularly
- Occasionally
- Rarely
- Never

24. Does the organization offer training on the responsible use of information for sustainability?

- Regularly
- Occasionally
- Rarely
- Never

Information literacy and sustainability in the context of implementing the National Records Management System (e-SNGD) in the Mozambican Public Administration

*Gildo Carlos Macie*¹

*Telma Campanha de Carvalho Madio*²

*José Carlos Abbud Grácio*³

*Cecília Preciosa Cabsela*⁴

ABSTRACT: Information literacy and sustainability are discussed in the context of implementing of the National Records Management System (e-SNGD), in the Mozambican Public Administration aiming to demonstrate the importance and relevance of equipping both public servants and the citizens with proper digital skills and tools to help the institutions achieve the Sustainable Development Goals, especially the goal 16. So, we look at public institutions as responsible for the management, preservation and access to digital archival documents that contribute to the materialisation of government plans and programmes through the decision-making process. We also look at the

¹ São Paulo State University (UNESP), Marília, Brazil.
E-mail:maiogc.macie@unesp.br | ORCID iD <https://orcid.org/0000-0003-4800-6551>

² São Paulo State University (UNESP), Marília, Brazil.
E-mail: telma.madio@unesp.br | ORCID iD <https://orcid.org/0000-0002-7031-2371>

³ São Paulo State University (UNESP), Marília, Brazil.
E-mail: jose.gracio@unesp.br | ORCID iD <https://orcid.org/0000-0001-7620-1309>

⁴ São Paulo State University (UNESP), Marília, Brazil.
E-mail: cp.cabsela@unesp.br | ORCID iD <https://orcid.org/0000-0002-2216-5792>

<https://doi.org/10.36311/2025.978-65-5954-624-4.p263-282>

literacy of citizens, who need to effectively access the available information, respond to their demands and guarantee their participation in public life. This is an exploratory study, based on bibliographical research in several reliable sources of information and documentary research, with a greater focus on Mozambican legislation and projects, which were fundamental for the construction of the theoretical framework, as well as for the interpretation and analysis of the information obtained in the empirical location, through the content analysis method. It was found that the Mozambican Public Administration is still not properly equipped with quality human resources in terms of information and digital literacy. Much investment is still needed to train human resources and equip them with the essential skills to work in records management and long-term digital preservation environments for archival documents. Likewise, it was found that citizens have not benefited from concrete training programmes to easily access information that can respond to their demands. Internet penetration is low, as is the availability of technological resources, which are concentrated in the capital, and this reality immediately excludes citizens from enjoying the right to access information and active participating in public life and, thus, creates an imbalance in terms of sustainability, which stems from the objectives of sustainable development. It is concluded that there is a need for a robust investment in the public administration sector to create the necessary conditions for the implementation of the National Records Management System, taking into account all the elements that will allow the desired success to be achieved regarding long-term digital preservation. Furthermore, there is no point in digitally equipping public administration without including citizens in training packages and investing in the expansion of technological infrastructures.

KEYWORDS: Digital preservation, Digital Information literacy, public administration professionals, Mozambique national records management system, Mozambican public administration.

INTRODUCTION

As Grácio, Fadel and Valentim (2013) point out, digital preservation is a pressing need, in the context of the increasingly growing and challenging production and dissemination of information in digital media. In the preservation process, it is necessary to guarantee continued, long-term access to digital archival information, which is authentic, complete and capable of being interpreted in the future, even in a different technological context.

This concern grows on a large scale when a special look is given to the public sector, as it constitutes the largest producer of archival information and concentrates in its custody the information that proves governmental actions and the interaction between the citizen and the

institutions that exercise state power and provide various services through Public Administration.

This responsibility of the Public Administration demands the existence of highly qualified professionals capable of responding to the challenges of the digital era and carrying out tasks aimed at ensuring sustainable development, where access to quality information and a precise response to citizens' desires are the focus of the professional practice.

In other words, these professionals need to have mastery of technologies, the logic of information storage and retrieval, as well as all the aspects present in the context of managing informational tools, respect for archival principles and correct information management, summarized in information literacy in complementarity with digital literacy.

Evidently, there are major risks associated with the digital context and these are based on the dependence of digital objects on technologies (software, hardware and formats) that are characterized by continuous and rapid evolution, generating direct consequences such as obsolescence and degradation of media.

For Santos, Ciocheta Mazuco and Flores (2020), technological obsolescence combined with the lack of management and preservation policies for digital records increases the risk of loss of information. In this context, it is essential that, among other elements, when implementing digital preservation, institutions seek to use internationally accepted models and standards that guarantee the effective reach of this implementation, looking at the systemic digital preservation approach as the most advisable model in the present.

Therefore, the topic “Information literacy and sustainability in the context of implementing the National Records Management System (e-SNGD) in the Mozambican Public Administration” is discussed as a way of drawing attention to the need and relevance of investing in the training and continuous training of professionals involved in the management of archival information throughout its life cycle and thereby contributing to sustainable development. So, the objective of this research *is to demonstrate the importance and relevance of equipping both public servants and the*

citizens with proper digital skills and tools to help the institutions achieving the Sustainable Development Goals, especially the goal 16.

This concern arises from the first signs that are seen in an “institutional and coordinated” manner towards the digital transformation of Public Administration, which is embodied in the implementation of the National Records Management System (e-SNGD). Unfortunately, this project is not accompanied by more robust professional training actions and guarantee of information literacy in Public Administration and these aspects can negatively affect the quality of services provided to citizens and the nation.

In the case of a digital transformation process, there is a set of elements that must be observed and are within the domain of professionals, we are talking about norms, standards and policies that outline the guidelines for professional action, with a view to effectively achieving objectives of digital preservation, provision of access to information for the usufruct of civil rights.

Information literacy combined with the awareness of the elements mentioned above contribute to a public commitment to development based on the precepts of the Sustainable Development Goals (SDGs) presented in the 2030 Agenda.

The discussion raised may serve to boost a more in-depth and contextualized theoretical-academic debate, as well as directing individuals who lead the implementation of the National Records Management System (e-SNGD) to the necessary reflection and investment in information literacy oriented to the use of adequate, rational and effective procedures that will support the decision-making process, as well as the construction of institutional and collective memory.

Methodologically, this is a qualitative study in its approach and descriptive-exploratory in its objectives. To build the theoretical basis, a literature review was carried out based on texts retrieved mainly from the Journal of Information Science and Documentation (InCID), Information Science Database (BRAPCI), Brazilian Institute of Science, Information and Technology (IBICT), Brazilian Journal of Digital Preservation (RBPD)

and other sources such as the National Archives Council (CONARQ), International Research on Permanent Authentic Records in Electronic Systems (InterPARES) and International Organization for Standardization (ISO).

To select the articles and books, we considered topics and subtopics concerning literacy; digital literacy; sustainability; sustainable development goals; information access; agenda 2023, both in Portuguese and English and we excluded all materials that were dealing with other several topics.

Likewise, documentary research was carried out, covering the legislation relating to the National State Archives System (SNAE); National Records Management System (e-SNGD); international documents such as “Transforming Our World: The 2030 Agenda for Sustainable Development” and other documents that proved to be essential for understanding and exploring the subject in study.

The data collected was systematized and analyzed based on the content analysis method, using Bardin (2009, 2011) as the main references. Bardin (2009) states that content analysis integrates different techniques such as categorical analysis, evaluation analysis, enunciation analysis, propositional discourse analysis and expression analysis. To carry out data analysis, in this research, it was necessary to implement the categorical analysis technique that is conceived by Silva and Valentim (2019) as the most appropriate for qualitative research.

Under the proposal of several authors and as implied by the name itself, “categorical analysis” suggests the creation of analysis categories. Chelimsky (1989) considers categories to be the “heart” of content analysis, as they guarantee the structuring of the information subject to analysis and this was the base for the creation of this research’s categories.

INFORMATION LITERACY AND SUSTAINABILITY

Silva (2008), in his approach to the issue of information literacy, reports that it arrived to Information Science from other sources and approaches such as business management, human resources, Pedagogy and

Didactics and its intersection with Educational Psychology and Sociology. So, from the 70s of the 20th century, it became pertinent to identify and promote personal skills for carrying out a set of tasks and activities.

The first to mention the term Information Competence was Paul Zurkowski in 1974, when he presented the report “The information service environment relationships and priorities” to the National Commission on Libraries and Information Science (NCLIS), which addressed social changes influenced by growing and remarkable technological development that put American citizens in great difficulties in using the technological resources available until that time, due to a lack of appropriate skills to the context (Furtado, Cavalcante, & Santos, 2022).

From then on, it was essential to invest in the creation and promotion of appropriate skills for professionals through training programs aimed at employment, with the aim of facilitating the search and retrieval of information to respond to various demands.

This new approach was easily welcomed by librarians and archivists from the perspective that Library, Documentation Center and Archive users need to be guided in the search of information (Silva, 2008).

The information professional began to assume a dual role (“teacher” and facilitator). As teachers, working on information literacy and as facilitators, guiding users within the information system, whether conventional or a digital system. However, in the current context, that of the post-custodial, informational and scientific paradigm, has been marked by major technological advances, where hardware and software change rapidly and, all of this, requires constant adaptation, more contextualized and not oriented to rigid criteria work.

In this sense, analytical and critical qualities are required from the information professional in their performance, satisfying all the nuances of information literacy and ensuring that the usufruct of citizenship, as well as the decision-making process take place in an effective and unequivocal manner.

It is in this context that Johnston and Webber (2006) give high importance and consider information literacy as a relevant discipline that can mitigate the phenomena arising from digital transformation and recover the narrative of analytical and critical qualities to define an information-competent person as social and self-aware person and not a simple repository of skills and knowledge.

Information literacy is conceptualized by Deepmala and Upadhyay (2021) as “[...] the set of skills to search and understand the sources that will provide accurate information (facts, knowledge, data).” (p.2). And, for IFLA (2006)

information literacy is assumed to be the knowledge and skills necessary to correctly identify information needed to perform a specific task or solve a problem, cost-efficiently search for information, organize or reorganize it, interpret and analyze it once it is found and retrieved (e.g. downloaded), evaluate the accuracy and reliability of the information, including ethically acknowledging the sources from whence it was obtained, communicate and present the results of analyzing and interpreting it to others if necessary, and then utilize it for achieving actions and results. (p.17)

Different from information literacy, digital literacy is understood by IFLA (2006) as “Knowledge and skills required to understand information and communications technologies (ICT), including hardware, software, systems, networks (both local area networks and the Internet) and all other components of computer and telecommunications systems.” (p.2).

Information and digital literacy constitute continuous learning throughout professional life, taking into account that the information and the digital context are characterized by constant and increasingly rapid changes. All of this creates a deeply complex, challenging and very demanding scenario regarding the attitudes of archivists.

Looking at information literacy and the digital transformation of public administration, the question of analytical and critical qualities is even deeper, since most of the state archival information is created and accumulated in public institutions as records resulting from activities that

testify the exercise of state power, as well as activities linked to fulfilling the duties and citizens' rights.

Information managers, as well as archivists are called to work within the framework of archival intelligence which, according to Furtado, Cavalcante and Santos (2022) is based on three dimensions:

- (i) Knowledge of archival theory, practice and procedures – Includes skills to understand archival terminologies; the interpretation of primary sources and their copies; internalization of the rules of archival institutions; understanding of their own level of knowledge domain and other areas.
- (ii) Strategies to reduce uncertainty and ambiguity – Considers that the uncertainty and ambiguity of questions and answers in research with primary sources makes the process difficult. In the mediation process, the archivist needs to obtain accurate information from the researcher to be able to meet their needs while the researcher must formulate clear questions to be able to effectively and efficiently use the archive.
- (iii) Intellectual skills – This is an essential characteristic for an excellent archivist, as it allows you to develop search strategies using the principle of provenance and interpret archival materials. It is also essential for the researcher, as it allows the association of original archival material and its representations.

Taking into account that this study is aimed at public administration, it is important to understand that the main users of archival information are the various professionals who carry out administrative tasks within a legal framework that gives them such power and formalizes their actions and legitimize the decision-making process. And, in the background, there is society in general (citizens) who, within the legal limits established by the laws on the right/access to information, may have access to ostensible documents.

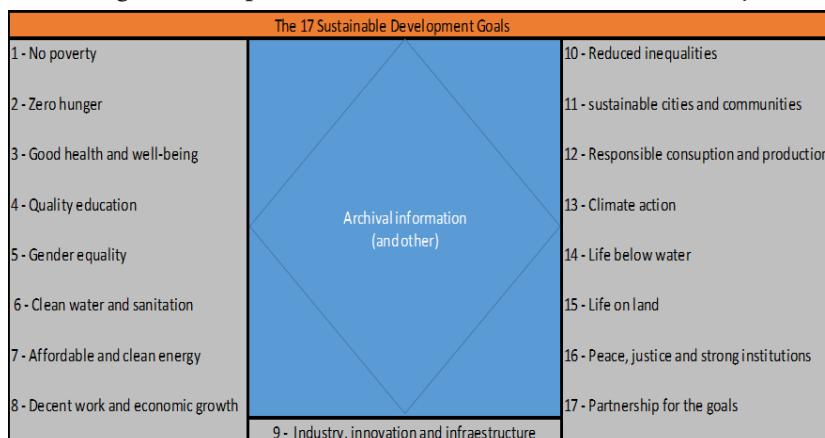
However, the idea of the fundamental role of the archivist or information manager is recovered in order to create the necessary conditions

so that access to information (traditional or digital, with adequate and balanced mechanisms) is a reality and the institution is aligned with the goals of sustainable development, set out in the 2030 agenda. It should be noted that, in order to achieve all the goals set out in the 2030 agenda, archival (and other) information plays a fundamental role, as it is at the center of the decision-making process.

Now, for example, the sustainability of major decisions that are taken by governments or administrations largely depend on the quality of information that is retrieved, accessed and used, meaning that a sustainable decision-making process is only possible in the presence of professionals with information literacy and who promote adequate document processing, correct disposal practices, positive information culture and oriented towards access to information.

Only under full conditions of information literacy and digital preservation of archival documents, the 17 (seventeen) sustainable development goals can be effectively and directly achieved, especially the goal 16. This means that all goals and the data and information that are necessary for their achievement can be found in several sources, but mainly in public institutions archives as shown in the figure 1 below.

Figure 1: Importance of information for sustainability



Source: Authors

DIGITAL PRESERVATION OF ARCHIVES IN THE PUBLIC SECTOR

Within the framework of technological transformations taking place in various dimensions and spheres, including in Public Administration (for a digital public administration), great concerns arise regarding the guarantee and fulfillment of citizens' fundamental rights, taking into account that Public Administration is the meeting point between government actions (exercise of power) and citizens' aspirations.

These citizens obviously expect to be served by high-quality professionals who can offer procedural speed, efficiency, effectiveness and precision in retrieving information that is of interest to them for various purposes and in the provision of services in general.

In this context, there is a public investment in the use of increasingly modern information and communication technologies (ICT), which allow the production and processing of electronic administrative processes, seeking to reduce bureaucracy; increase transparency, control, agility, equality and other elements associated with the assumptions of the social contract between the state and citizens.

However, Schiefler, Cristóvam and Sousa (2020) draw attention to the negative consequences that may arise from these advances in the adoption of electronic administrative processes, raising aspects linked to inclusion and exclusion, as "there are cases in which the virtualization of administrative activity may be responsible for deepening inequality between citizens", taking into account inequalities in access to digital platforms.

Furthermore, an approach to digital preservation proves to be indispensable for understanding the actions of Public Administration professionals aimed at sustainable development and it is, therefore, essential that these professionals' present capabilities and qualities integrated into information literacy or competence, especially those who deal with archival information.

As stated by Santos (2012), technology has demonstrated a new paradigm for the management and preservation of archival records, as "the

document is no longer an indissoluble unit between information and its recording support.”

In this new paradigm, all practices that circumscribe the document throughout its life cycle have changed, or in other words, demand new approaches, capabilities and professional skills based on collaborative work.

The volume of documents has increased due to the ease of production and circulation of information, but major challenges remain linked to control, security, authenticity and integrity, which can only be properly addressed based on the implementation of long-term digital preservation. This scenario may be more striking in Public Administration, taking into account its dynamics, routines.

Therefore, digital preservation is fundamental and unavoidable in the current context of the information and knowledge society. Elves (2012) states that the history of digital files is intrinsically or completely linked to the history of computers and, in a linear way, a connection can be made to the very concept of digital records which refers to a record produced in a computational environment, characterized by binary digits, which can only be read using computational devices. Furthermore, the entire life cycle of these records takes place in this computational environment.

This is why Formenton and Gracioso (2020) state that the main difficulties of digital preservation arise from the peculiarities that characterize digital objects, whether they are born digital or digitized, as these particularities reflect on issues of reliability, authenticity and integrity of the records in their management, archiving and long-term access.

The challenges of digital preservation are not just technical ones, other factors influence the increase in complexity surrounding the matter. Evidently, there is also the influence of capitalism, a factor that leads companies that manufacture technologies to compete with each other and accelerate new inventions to sell and satisfy the increasingly informed and demanding user, as well as to establish their positions in the business world, without necessarily worrying about observing archival peculiarities (Elves, 2012).

In this sense, it is essential that archivists keep up with technological developments and equip themselves in order to effectively integrate and respond to the demands placed on them, guaranteeing the maintenance of the authenticity and integrity of digital objects, as well as its access (the focus of all their actions).

Ruusalepp (2005) warns that digital preservation is still seen as a not completely resolved subject, its practice in archives (of public administration) is in its infancy and the techniques and methods are still under discussion, this is because the theory itself around of digital preservation had to be considered. It was destroyed after the fact and its consolidation has always proved to be quite difficult due to the constant change in technology and other elements associated with the peculiarities of archival documents.

In terms of conceptualization, Tavares and Freire (2021) state that Digital Preservation is a set of practices applied to digital documents as a way of maintaining continued access to that document, so that the information remains authentic and capable of being interpreted in the future.

Grácio et al. (2013) specified this concept and added other elements, considering Digital Preservation as an organizational management process that encompasses several activities necessary to ensure that a digital object can be accessed, recovered and used in the future, based on Information and Communication Technologies (ICT) existing at the time and with guarantees of authenticity.

It should be noted that authenticity is based on the guarantee that the digital object is authentic, meaning that, it reflects the original content of its creation/production. The authors emphasize that the issue of authenticity is central and, therefore, is practically mentioned in all concepts of digital preservation, as digital documents attract a set of problems or risks that, if not properly controlled, can easily alter the authenticity and the integrity of digital objects (Cabsela & Macie, 2022).

The risks mentioned above are associated with the dependence of these types of documents on the technological environment resulting on

direct consequences such as obsolescence, degradation and other situations (Cabsela & Macie, 2022).

Márdero Arellano (2008) suggests that the archival perspective of preservation starts from the integral understanding of the limits, meanings and all the aspects surrounding documents (authenticity, proof/evidence quality, integrity of information, context of production, maintenance and more), emphasizing that organizations and archival institutions that create and are responsible for the permanent custody of these documents must carry out to keep digital objects authentic.

It is worth highlighting that archival documents have defining characteristics (fixity, organicity, naturalness, uniqueness, authenticity and impartiality) and it is essential that these are respected, as they are fundamental for the acceptance of documents as records of actions carried out by a given institution or person and they can exercise their evidentiary function without any suspicion or limitations (Santos, 2012).

Now, the loss of some of the characteristics mentioned above leads to the loss of the (probative) value of archival documents, which has consequences for the continuity of institutional actions, negatively interfering with the constitution of memory and the usufruct of citizenship. The digital preservation concepts presented refer to a combination of efforts that aim to keep documents unchanged (authentic and intact), within their production context and accessible in the future using media and formats different from those at the time of creation, therefore, it is important that digital preservation is complete, planned, coordinated, evaluated and controlled.

To guarantee this plenitude of digital preservation, Grácio et al. (2013) suggest that it must, firstly, be based on a policy, which observes the combination of three fundamental elements, the legal, technical and organizational aspects, that is, preservation cannot be implemented without there being a formal instrument that instructs and indicates the guidelines for professionals to act, the scope of preservation, the infrastructural and technological conditions, the models and standards and other guidelines

that will allow the maintenance of the essential characteristics and safeguard the longevity of public administration documents.

The foundation of preservation in a policy is, among other aspects, important to ensure that the life cycle of documents takes place in an uninterrupted chain of custody, guaranteeing completeness, efficiency and effectiveness in the recovery of information, moving towards integral support to sustainable development that is based on the availability and quality of information. It should be noted that it will not be the operating systems that guarantee the achievement of these elements, but rather the actions of competent professionals who work in institutions committed to promoting information literacy (without leaving aside digital literacy) in favor of sustainability and other purposes.

Advancing to a digital perspective cannot mean abandoning traditional archives, as these still predominate in institutions and need special attention. The digital transformation itself is truly conditioned by the way in which physical documents are stored and retrieved.

THE RECORDS MANAGEMENT NATIONAL SYSTEM (e-SNGD) AND SUSTAINABILITY

The e-SNGD reveals itself as the first sign (attempt) aimed at implementing the digital preservation of archival documents in the Mozambican Public Administration.

The system arises in the context of an attempt to overcome the challenges imposed by COVID 19 and in the spirit of modernizing Public Administration to simplify procedures and processes and, thus, respond to the various challenges linked to the provision of services provided by public institutions, although computerization of such services is not yet effective (MAEFP et al., 2022a).

Regarding the implementation methodology, two phases are planned, the pilot and the expansion. At the moment, the implementation of this system is in the pilot phase, involving only the Ministry of State Administration and Public Service (MAEFP); the Mozambique

Documentation and Information Center (CEDIMO); the National Institute of Electronic Government (INAGE); the Historical Archive of Mozambique (AHM); the Commission for the Implementation of State Secrecy (CPISE). These institutions are involved in the development of the e-SNGD and the management of the National State Archives System (SNAE) (MAEFP et al., 2022a).

As presented by MAEFP et al. (2022b), in the “Terms of Reference for the operationalization of e-SNGD”, the central objective of this system is “to provide the Public Administration with technological mechanisms for monitoring the processes of managing State documents and archives.” (p.3). To achieve this objective, the system will observe two phases of implementation, first, the pilot phase that integrates the institutions mentioned above and, second, the expansion phase that will cover the entire Public Administration.

In the implementation process, it is planned to carry out a set of contacts to exchange experiences in the Southern African region with member countries of the Eastern and Southern Africa Regional Branch of the International Council on Archives (ESARBICA) and in other countries with experience in electronic records management such as South Africa, Botswana, Tanzania, Malawi, Malaysia, Portugal, Brazil, and Canada, as well as exchanging experience at local level, in the municipalities of Dondo (Sofala) and Quissico (Inhambane) to consolidate the gains achieved in the development of e-SNGD and minimize future errors.

These experience exchange meetings are necessary in this process, because as suggested by Grácio et al. (2020) the search for partnerships with other institutions that work in the area of digital preservation is essential, as these processes cannot be developed in an environment of complete isolation. Partnerships allow the exchange of knowledge and experiences for the multidisciplinary team designated as responsible for implementing digital preservation, which will provide the team with knowledge about international models, norms and standards.

It should be noted that e-SNGD includes two subsystems, CloudGov and e-Doc. According to MAEFP et al. (2022), cloudGov was designed

to function as a permanent archive and is hosted on the Government's internal network (GovNet) and the eDoc is a records management subsystem oriented to each institution's internal processes and essentially aims to guarantee interaction between users and public institutions.

Taking into account that item nr. 8 of the "Information on the Development of the e-SNGD" states that it is designed with maturity for future modifications and communication with other systems, ensuring interoperability. It is essential to explore this element and the necessary conditions must be created for the parallel installation of more systems that will serve to provide access, which could be AtoM, as it is a well-known system in Mozambique and public servants and citizens can operate it with some ease.

The issue of internet penetration, as well as literacy or digital literacy, is also crucial for access to information and the exercise of citizenship, in this context, according to the National Institute of Statistics, in the sense of 2007 – 2017, only 8.1% of men had access to the internet and for women the percentage was 5.3%, which reveals an extremely challenging picture.

More current data indicate a slight increase, but still far from the most favorable proportions and according to the Ministry of Science and Technology (2023), the highest rate of access to ICT and the internet is concentrated in the city of Maputo, the capital of the country, with 87.9% of the country and the remaining 2.1% provinces ranging from 0.4% to 3.1% are distributed across the remaining provinces of the country. There are few direct actions aimed at mass access to the internet and ICTs in general.

However, this framework needs to be improved and ensure that interoperability is a reality. Interoperability is a crucial element in terms of literacy, as employees who are not fully qualified cannot be able to deal with the various intercommunications between the systems and in the meantime, the chain of custody may be broken, compromising authenticity and reliability.

As Formenton and Gracioso (2020) warn, maintaining authenticity and reliability is essential. Therefore, we understand that inauthentic and unreliable documents cannot guarantee any institutional stability or sustainability, but they could contribute to making wrong decisions that contradict the goals of sustainable development, especially objectives 9 and 16.

In the e-SNGD project, many of the essentially archival elements, such as standards and norms, are not presented, as it is moving forward in a context in which there are no digital preservation policies and, in the project, there is no guidance for institutions to develop their policies to later implement the e-SNGD in an environment that provides the necessary security and trust.

As Macie, Madio and Grácio (2023) point out, even in the absence of a national digital preservation policy, nothing prevents institutions from developing their own policies and, in this regard, there are considerable success stories around the world that can serve models for policy making.

Furthermore, it is the fact that no mention is made of the elements of security, validity, authenticity, integrity of archival documents or metadata management, that is, time stamps or electronic/digital signatures are not addressed, elements that are basic and indispensable for a process of this nature.

Therefore, carrying out the analysis of the recovered texts and documents and considering the categories that involve information literacy in public administration, the e-SNGD does not configure a mechanism that is aligned with this perspective. The training and professional training actions that have been carried out do not focus on archival assumptions, they are focused on the use/handling of systems, it means that the focus is particularly technological.

With this situation, there could easily be a development from the perspective of digital literacy and not necessarily from the perspective of information literacy, which will not help much in solving problems and could compromise informational balance or sustainability.

CONCLUSION

It is clear from the bibliographic research that information literacy, combined with a balanced digital preservation, must involve a deep concern with the digital archives throughout its life cycle. Digital records need to be handled by competent professionals, who can easily understand that documents need to be stored in appropriate environments for each moment of the life cycle in order to ensure that they are not altered or modified and the chain of custody is not broken, thus maintaining a balance at various levels.

Specifically, it was found that the Mozambican Public Administration is still not properly equipped with quality human resources in terms of information and digital literacy. There is still a lot of investment needed to train human resources and provide them with essential qualities and tools to operate in records management and long-term digital preservation environments for records.

Likewise, it was found that citizens have not benefited from concrete training programs in order to be able to easily access information that can respond to their demands. Internet penetration is weak, as is the availability of technological resources. All these are concentrated in the capital city and this reality immediately excludes citizens from benefiting from the right to information access and active participation in public life and, thus, creates an imbalance in terms of sustainability emanating from the goals of sustainable development.

It is clear that there is a need for a robust investment in the public administration sector, in order to create the necessary conditions for the implementation of the e-SNGD, respecting all the elements that will allow the desired success to be achieved regarding long-term digital preservation. Furthermore, there will be no point in digitally equipping public administration without including citizens in training packages, as well as investing in the expansion of technological infrastructures.

Another important element is that the e-SNGD needs to be adapted to the precepts of systemic digital preservation, which involves observing internationally accepted norms and standards and their full

implementation, guaranteeing the overcoming of technological problems that affect the authenticity and integrity of archival digital documents.

If all these aspects are successfully considered, Mozambican public sector will be able to actively contribute to the achievement of the Sustainable Development Goals, mainly the goal 16, because the information ecosystem will be working in the proper way.

REFERENCES

Bardin, L. (2009). *Análise de conteúdo* (4a ed.). Edições 70.

Bardin, L. (2011). *Análise de conteúdo*. Edições 70.

Cabsela, C. P., & Macie, G. C. (2022). Políticas de preservação digital: Mapeamento dos aspectos legais em Brasil e Moçambique. *Revista EDICIC*, 2(1), 1-15. <http://ojs.edicic.org/index.php/revistaedicic/article/view/1500>.

Chelimsky, E. (1989). *Content analysis: A methodology for structuring and analyzing written material*. United States General Accounting Office.

Deepmala, S., & Upadhyay, A. K. (2021). Information literacy: An overview. *Ilkogretim Online - Elementary Education Online*, 20(1), 4227-4234. <http://ilkogretim-online.org>. <https://doi.org/10.17051/ilkonline.2021.01.465>

Elves, D. (2012). *Advocating electronic records: Archival and records management promotion of new approaches to long-term digital preservation* [Dissertação de Mestrado]. Universidade de Manitoba, Universidade de Winnipeg.

Formenton, D., & Gracioso, L. S. (2020). Digital preservation: Challenges, requirements and scientific output. *RDBCI: Revista Digital de Biblioteconomia e Ciência da Informação*, 18, e01808658868. <https://doi.org/10.20396/rdbc. v018i0.8658868>

Furtado, R. L., Cavalcante, C. R., & Santos, F. C. A. (2022). Competência arquivística e inteligência arquivística como vertentes da competência em informação no horizonte da arquivologia contemporânea. *Perspectivas em Ciência da Informação*, 27(2), 163-192.

Grácio, J. C. A., et al. (2020). Modelo para elaboração de políticas de preservação digital de documentos de arquivo por instituições de ensino superior: O caso da Unesp. *Reciis – Revista Eletrônica de Comunicação, Informação e Inovação em Saúde*. 14(3), 563-579. <http://www.reciis.icict.fiocruz.br>

Grácio, J. C. A., Fadel, B., & Valentim, M. L. P. (2013). Preservação digital nas instituições de ensino superior: Aspectos organizacionais, legais e técnicos. *Perspectivas em Ciência da Informação*, 18(3), 111-129.

International Federation of Library Associations and Institutions (IFLA). (2006). *Guidelines on information literacy for lifelong learning*. Boca del Rio, México.

Johnston, B., & Webber, S. (2006). As we may think: Information literacy as a discipline for the information age. *Research Strategies*, 20(3), 108-121.

Macie, G. C., Madio, T. C. C., & Grácio, J. C. A. (2023). Cultura informacional consentânea com a preservação digital de documentos arquivísticos: Uma viragem necessária no contexto moçambicano. *InCID: Revista de Ciência da Informação e Documentação*, 14(1), 173-191. <https://doi.org/10.11606/issn.2178-2075.v14i1p173-191>

Márdero Arellano, M. A. (2008). *Critérios para a preservação digital da informação científica* (Tese de doutorado, Universidade de Brasília).

Ministério da Administração Estatal e Função Pública (MAEFP) et al. (2022a). *Informação sobre o desenvolvimento do Sistema Nacional de Gestão Documental (e-SNGD)*. MAEFP.

Ministério da Administração Estatal e Função Pública (MAEFP) et al. (2022b). *Termos de referência para a operacionalização do Sistema Nacional de Gestão Documental (e-SNGD)*. MAEFP.

Ministério da Ciência, Tecnologia e Ensino Superior. (2023). *Indicadores de ciência e tecnologia em Moçambique 2022-2023*. MCTES.

Ruusalepp, R. (2005). *Digital preservation in archives: Overview of current research and practices*. National Archives of Sweden.

Santos, H. M., Ciocheta Mazuco, F., & Flores, D. (2020). Preservação sistêmica de documentos arquivísticos digitais: Uma perspectiva holística. *PerCursos*, 21(46), 244-271. <https://doi.org/10.5965/1984724621462020244>

Santos, V. B. (2012). Preservação de documentos arquivísticos digitais. *Ciência da Informação*, 41(1), 114-126.

Schiefler, E. A. C., Cristóvam, J. S. S., & Sousa, T. P. (2020). Administração pública digital e a problemática da desigualdade no acesso à tecnologia. *International Journal of Digital Law*, 1(2), 97-116.

Silva, A. M. (2008). Inclusão digital e literacia informacional em ciência da informação. *Prisma.com*.

Silva, E., & Valentim, M. L. P. (2019). Avaliação da aplicação do método ‘análise de conteúdo’ em pesquisa sobre processos de gestão da informação e do conhecimento como subsídios para a geração de inovação. *Informação & Informação*, 24(1), 326-355. <http://www.uel.br/revistas/informacao>

Tavares, A. L. L., & Freire, I. M. (2021). A frente de pesquisa sobre preservação digital no Brasil. In L. M. B. B. Toutain (Org.), *A ciência da informação em movimento: Memória, esquecimento e preservação digital* (pp. 135-172). Ed. da Universidade Federal da Bahia.

An overview of prominent topics on teaching Sustainability and Information Literacy

*Paula Grgić*¹

*Mate Juric*²

ABSTRACT: Sustainable development can most simply be described as development that meets the needs of today's generations, without jeopardising the ability of future generations to satisfy their own needs. Information literacy competencies are crucial for successfully approaching sustainability issues. It is possible for information literacy courses to raise awareness and understanding of the concept of sustainable development. Students should be educated about information literacy and sustainability, and this requires the creation of an appropriate curriculum. Information professionals not only teach information literacy skills but will also be a leading force in creating effective methods for teaching sustainable thinking in information literacy, which includes raising the awareness about the importance of sustainable development, and intertwining information literacy with sustainability in various contexts. Information skills, primarily critical thinking skills are essential for solving complex problems, but also positive attitudes about the importance of sustainable development need to be promoted. The goal of this overview of prominent topics in teaching Sustainability and Information Literacy is to identify and map key concepts pertaining to information literacy instruction in the context of sustainable development. The analysis was conducted using a bibliometric approach, applying the VOSviewer tool and SCOPUS bibliographic database data. Papers linking information literacy and sustainable development in education were searched, resulting in 159 relevant publications, with no time limit. The analysis revealed topics such as green libraries, digital

¹ University of Zadar, Zadar, Croatia.
E-mail: paula.grom15@gmail.com

² University of Zadar, Zadar, Croatia.
E-mail: mjuric@unizd.hr | ORCID iD <https://orcid.org/0000-0003-4153-3594>

<https://doi.org/10.36311/2025.978-65-5954-624-4.p283-290>

and critical literacy, and the integration of sustainability into teaching. Libraries, research skills, and participatory methods emerged as key for developing information literacy. A growing interest in this topic in higher education was also noted. Overall, information literacy is essential for achieving sustainable development, as it enables critical evaluation of information and supports lifelong learning. Libraries can play a key role in this process.

KEYWORDS: information literacy, sustainability, sustainable development, education, SCOPUS

INTRODUCTION

The 2030 Agenda for Sustainable Development (United Nations, 2015), adopted by all United Nations Member States in 2015, includes 17 Sustainable Development Goals (SDGs) which encompass ending poverty and inequality, improving education, and tackling climate change. Teaching information literacy is inherently related to the Goal number 4 – Quality Education. One of SDGs indicators is ensuring that all learners acquire the competencies needed to promote sustainable development, including, among others, through education for sustainable development and sustainable lifestyles. More broadly, it is about providing lifelong learning opportunities for all. However, it could be argued that to provide opportunities for lifelong learning, it is necessary to empower students with competencies for learning from multiple sources of information, recognising quality information and actively participating in the creation and sharing of new knowledge. Such information literacy competencies are the basis for successfully approaching problems, challenges and opportunities related to all 17 sustainable development goals.

According to Zorkowski (1974) who first coined the term information literacy, “information is not knowledge; it is concepts or ideas which enter a person’s field of perception, are evaluated and assimilated, reinforcing or changing the individual’s concept of reality and/or ability to act. As beauty is in the eye of the beholder, so information is in the mind of the user.” In today’s world when technology is rapidly being developed and is heavily relied upon in our everyday life more than ever it is important to know how to use it properly and safely. Everything we do will leave a digital trace and that could affect us in a both positive and negative way. That is why we

need to acquire a set of information literacy competencies that will enable us to navigate the digital and information world safely.

Sustainable development is most simply described as development that meets the needs of today's generations, without jeopardizing the ability of future generations to satisfy their needs. As supported by the authors Repanovici, Rotaru and Murzea (2021) it is possible for information literacy courses to raise awareness and understanding of the concept of sustainable development. Students should be educated about information literacy and sustainability, and this requires creating an appropriate curriculum. Author Wikforss (2021) believes that recognising the truth is one of the essential components of education because it is necessary to teach children to recognise it in everyday life in order to avoid the influence of misinformation. Today, younger generations growing up with technology are exposed to various sources of information, which is why they need to be educated on how to recognise required or truthful information in a sea of available information, and how to use it ethically.

The goal of this overview of prominent topics in teaching Sustainability and Information Literacy was to identify and map key concepts pertaining to information literacy instruction in the context of sustainable development.

METHOD

VOSviewer (2024), a bibliometric tool for visualization of concept relations was applied, with the data gathered from the SCOPUS database. The bibliographic data from the SCOPUS database was gathered with the following search: (TITLE-ABS-KEY (“sustainability” OR “sustainable development”) AND TITLE-ABS-KEY (“information literacy”) AND ALL (teaching OR instruction OR learning OR education)). The search was performed on January 9, 2024, with no data range limit. The oldest document in the results was from 2005. There were 159 documents found, and none were disregarded. The figure (Appendix) includes various prominent topics and contexts. For example, academic, public, digital, and green libraries, the concepts of digital, media, and critical information

literacy, followed by pedagogies related to lifelong, online and blended learning, and also active research and faculty-librarian collaboration. Some of the additional concepts include education for sustainable development, entrepreneurship, innovation, and social justice.

RESULTS AND DISCUSSION

In this overview of prominent topics on teaching information literacy and sustainability, several topics are explored in more detail. Authors Kurbanoglu and Boustany's work (2014) was focused on how to transform informational literacy into green and contribute to green library movement. For this they analysed relevant publications both past and recent. They found that "Reducing the ecological footprint of our information behaviour, choices and actions is possible by developing sustainable thinking skills as part of our information literacy skills repertoire." (Kurbanoglu & Boustany 2014). It is necessary for us to recognise that there is a dire need for more information pertaining to the concept of green information literacy which is unfortunately neglected. Other than that, we need to embed sustainable thinking into information literacy instruction. Like them but from another approach authors Parker and Veeraghanta (2013) talked about "Embedding information literacy within sustainability research: first year student's perspectives". In her paper she presented the argument that integrating content pertaining information literacy into an undergraduate research project will give first year students an opportunity to develop and acquire skills for lifelong learning. Results shown were mixed, some students progressed with time and more lessons while others showed less improvement.

Authors Cisek and Krakowski (2021) have explored how participant-created visual materials were employed in information literacy research in the second decade of the 21st century. Results showed that the potential of participant – generated visual data is not fully realized by information literacy researchers. Verbal data coming from qualitative methods prevailed in studies ranging from 2011 to 2020. Despite that some visual data gathering techniques did appear. They have also noted that participatory

visual methods favor the participant's own views over the researchers' presumptions and are important in understanding the information literacy problems.

Discussion about sustainability is spreading in higher education as awareness about it keeps increasing, which is supported by work from author Stark (2011). She talked about integrating sustainability into information literacy instruction through libraries. Furthermore, library organizations are addressing sustainability and finding various ways to incorporate green thinking into action. This goal should have specific measures like sustainable strategies that should be integrated into all decisions that are important for library institutions, for example: collections, digitalization of paper books and documents, equipment, services that they offer etc. Other than this as someone that works in a library it is their goal to spread literacy and in this case information literacy as well. This is their responsibility to teach and spread knowledge to others, especially school and academic libraries. Their role is to foster information literacy across the curriculum to instill and promote lifelong critical thinking. From this we can see that a certain understanding and balance needs to be achieved between humans and their environment in order to accomplish sustainability. This means that rather than just libraries and their staff, students too need to be involved in this process. They need to learn not just information literacy "skill set" but also critical thinking that will help them when they become part of the working society. According to Stark, "It is the role of academic libraries to foster information literacy across the curriculum in a way that promotes and instills life-long critical thinking. As a cornerstone of academic librarianship, information literacy should be included in discussions about sustainability and academic libraries" Stark (2011). She further explains how sustainability should become an integral way of thinking, inherently connected to critical and applied thinking.

Authors Lambrechts and Van Petegem (2016) have explored specific competences for sustainable development within the context of higher education. They focused on strengthening research competencies for sustainability. They have mapped the research competencies to the information literacy concepts and have shown that research skills and

research-based pedagogical methods are exceptionally important for sustainable development. The sustainability issues are complex, require multiple sources of information and a critical approach which is at the core of information literacy competencies.

We are an information society or a networked society, as defined by author Castells (2004), because we are all connected, and information is constantly being created and shared. Through the internet, we can connect to any part of the world and, by extension, to people themselves, as the author defines the internet as a network consisting of a set of nodes, and we can connect to the whole network by accessing one of these nodes. Society is dynamic (Fuchs, 2007), meaning it is constantly changing, and we need to be able to keep up with it. Teachers have a very important role to play in laying the foundations for further learning, i.e. lifelong learning. In addition to schools teaching children about the possible dangers of media and the importance of new literacies that are essential in today's world, the role of information professionals is also important. Information professionals not only teach information literacy skills but will also be a leading force in creating effective methods for teaching sustainable thinking in information literacy, which includes raising awareness of the importance of sustainable development and intertwining information literacy with sustainability in various contexts. Information skills, primarily critical thinking skills are essential for solving complex problems, but positive attitudes about the importance of sustainable development also need to be promoted.

CONCLUSION

In this paper, some of the prominent topics and contexts are emphasized in the literature reviewed. The VOSviewer visualization of concept relations covers a larger number of topics. Salient topics that need to be further explored in more extensive literature reviews include pedagogies related to lifelong, online and blended learning, and active research and faculty-librarian collaboration. Empowering students with information literacy competencies is a key for successfully approaching sustainability issues.

REFERENCES

Castells, M. (Ed.). (2004). *The network society: A cross-cultural perspective*. Edward Elgar Pub.

Cisek, S., & Krakowska, M. (2021). *Participant-generated visual data in information literacy research in the second decade of the 21st century: A literature review* (p.47). Book abstracts off the Seventh European Conference on Information Literacy (ECIL). Information Literacy Association, Paris.

Fuchs, C. (2007). *Internet and society: Social theory in the information age* (Vol. 9). Routledge.

Kurbanoglu, S., & Boustany, J. (2014). From green libraries to green information literacy. In S. Kurbanoglu, S. Spirane, E. Grassian, D. Mizrahi, & R. Catts (Eds.), *Information Literacy: Lifelong Learning and Digital Citizenship in the 21st Century* (Vol. 492, pp.47-58). Springer International Publishing. https://doi.org/10.1007/978-3-319-14136-7_6

Lambrechts, W., & Van Petegem, P. (2016). The interrelations between competences for sustainable development and research competences. *International Journal of Sustainability in Higher Education*, 17(6), 776–795. <https://doi.org/10.1108/IJSHE-03-2015-0060>

Parker, I. A., & Veeraghanta, S. (2013). *Embedding information literacy within sustainability research: First year students' perspectives*. In Papers of the 120th ASEE Annual Conference & Exposition (Paper ID #5821, pp. 23.478.1-23.478.13). American Society for Engineering Education, Atlanta.

Repanovici, A., Rotaru, C. S., & Murzea, C. (2021). Development of sustainable thinking by information literacy. *Sustainability*, 13(3), 1287.

Stark, M. R. (2011). Information in place: Integrating sustainability into Information Literacy instruction. *Electronic Green Journal*, 1(32). <https://escholarship.org/uc/item/1fz2w70p>

United Nations. (2015). *Transforming our world: The 2030 Agenda for sustainable development (A/RES/70/1)*. UN General Assembly. <https://sdgs.un.org/2030agenda>

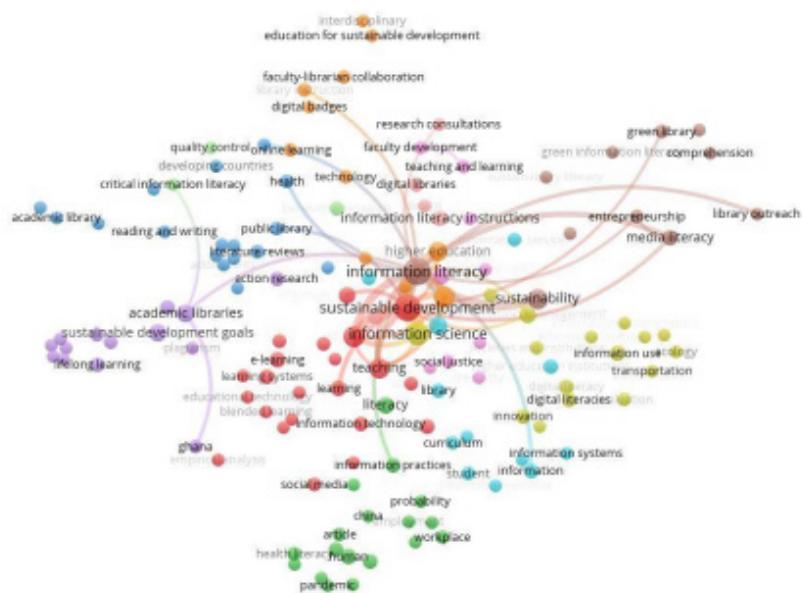
VOSviewer: Visualizing scientific landscapes. (n.d.). VOSviewer. <https://www.vosviewer.com/>

Wikforss, A. (2021). Knowledge and critical thinking in school. In A. Wikforss, *Alternative facts: On knowledge and its enemies* (pp. 141-173). Zagreb: Oceanmore.

Zurkowski, P. G. (1974). *The Information Service Environment Relationships and Priorities*. Related Paper No. 5. (Report ED 100391). National Commission on Libraries and Information Science, Washington DC. URL <https://files.eric.ed.gov/fulltext/ED100391.pdf>

Appendix

VOSviewer (n.d.) visualization of keywords co-occurrence for teaching information literacy and sustainability



Information literacy: university extension and contributions to Sustainable Development Goals

*Rita de Cássia Silva dos Santos*¹

*Glória Maria Lourenço Bastos*²

*Tamara de Souza Brandão Guardado*³

*Celia Retz Godoy dos Santos*⁴

ABSTRACT: This study analyzes several strategies for developing information literacy on the topic of the Sustainable Development Goals (SDGs), presenting extension activities carried out at two universities in the city of Bauru, São Paulo, Brazil, during and after the period of social isolation caused by the Covid 19 pandemic. Information literacy requires people to recognize when information is needed and to have the ability to locate, evaluate, and effectively use the necessary information. The qualitative methodological approach used action research, carried out in close association with an action or resolution of a collective problem in which researchers and participants are involved cooperatively. The work to develop information literacy skills included discussions on the topic, proposals for solving problems collectively, presentation of projects, discussion of information search strategies and how to select sources, as well as processes for public dissemination of the work carried out. The context examined enables the training of professional citizens

¹ São Paulo State University, Marília, São Paulo, Brazil.
E-mail: rcs.santos@unesp.br | ORCID iD <https://orcid.org/0000-0002-7647-1066>

² Universidade Aberta, Lisbon, Portugal.
E-mail: Gloria.Bastos@uab.pt | ORCID iD <https://orcid.org/0000-0002-1432-225X>

³ São Paulo State University, Marília, São Paulo, Brazil.
E-mail: tamara.guardado@unesp.br | ORCID iD <https://orcid.org/0000-0001-7925-2021>

⁴ São Paulo State University, Bauru, São Paulo, Brazil.
E-mail: celia.retz@unesp.br | ORCID iD <https://orcid.org/0000-0003-4473-8122>

<https://doi.org/10.36311/2025.978-65-5954-624-4.p291-314>

and connects the University with the demands of the population in the production of knowledge to overcome social inequalities. As a result, students produced scientific articles and posts, communication plans, and an interdisciplinary event open to the community. They worked as a team and delved deeper into the topic of the SDGs.

KEYWORDS: Information Literacy, Sustainability, University Extension.

INTRODUCTION

In Brazil, after the most critical period of the pandemic, many universities mixed hybrid teaching with extracurricular activities as a daily didactic pedagogical practice. This situation led to the search and implementation of more active teaching and learning methodologies, to allow students to develop integrated skills. In this context, the development of information literacy skills, in this blended learning modality, was one of the strategies implemented. Thus, the student was placed in problem-solving situations in which it was necessary to search, select, and disseminate information, aiming for continuous learning in a changing scenario.

This study aims to describe pedagogical strategies for developing information literacy (IL) competencies in association with the theme of the Sustainable Development Goals (SDGs), which are a universal call by the United Nations (UN) for action to end poverty, protect the planet and ensure that all people have peace and prosperity. The work done with the students took place within the scope of Extension activities developed at two universities in the city of Bauru, São Paulo, Brazil, from 2022 to 2023, during and after the period of social isolation caused by the COVID-19 pandemic. The actions carried out and the results obtained are described and analyzed: first, at the public university Universidade Estadual Paulista, Unesp, in the Public Relations course, in the subject “Public Opinion Research Laboratory”; second, in the subject “Interdisciplinary Law Work”, in a university extension program, in the Law course at a private university (Instituto de Ensino Superior de Bauru - IESB).

The central purpose of the pedagogical work performed by teachers and students was the development of IL, defined primarily as a set of skills that requires people to recognize when information is needed, and to have

the ability to locate, evaluate and effectively use the necessary information (ALA, 1989). The activities were more specifically linked to the following SDGs: SDG 4 – Quality Education; SDG 5 – Gender Equality; SDG 16 – Peace, Justice and Strong Institutions; SDG 17 – Partnerships for the Goals. The articulation between these two domains would allow the practical application of research procedures by students, integrating the skills associated with IL, in connection with the search for a deeper knowledge of the SDGs and their social implications. The university extension area was considered the most appropriate pedagogical setting for this intersection, which ultimately led to the production of artifacts by students representing the various competences developed.

In the chapter, we begin by explaining some elements related to the guiding concepts for the work carried out with students: Information Literacy (IL) and Sustainable Development Goals (SDGs), in connection with the context of higher education. Next, we describe the methodology, based mainly on action research, and specify the pedagogical actions that were followed by teachers and students, which are subsequently the object of analysis.

THEORETICAL FRAMEWORK

INFORMATION LITERACY IN HIGHER EDUCATION

By establishing itself as a privileged space for the development of specific basic knowledge, the University stimulates new horizons of theories and practices. In university extension, the development of transversal skills appears as a way of relating different subjects and expanding the analytical and knowledge production capacity of students who dedicate themselves to extension activities.

It is worth highlighting that the concept of competence has different perspectives in the view of authors dedicated to this field of study (Fleury & Fleury, 2001; Fleury & Lacombe, 2003) and permeates different areas of knowledge such as Economics and Strategy (Wernerfelt, 1984; Porter, 1991), Education (Perrenoud, 1999; Takahashi & Fischer, 2009),

Sociology of Work (Hirata, 1994), and Communication and Information Science (Dias & Belluzzo, 2003; Valentim, 2008; Belluzzo, 2017), among others.

Logically, the concept of competence is not homogeneous but has similarities in the different fields with which it can be related, adapting to each of them. In this context, skills associated with IL emerge with particular importance, as this is a transversal area that allows students to research and apply knowledge following the most appropriate parameters for each topic studied.

The concept of information literacy has become more complex since Paul Zurkosky created it in 1974. Current contexts, in which digital environments have assumed increasingly more importance, also require this enrichment of the concept and the constellation of terms that have been associated, as with media literacy or even digital literacy. The definition presented by UNESCO (2013) has been considered as the one that encompasses the most important elements: media and information literacy is defined as “a set of competencies that empower citizens to access, retrieve, understand, evaluate and use, create as well as share information and media content in all formats, using various tools, in a critical, ethical, and effective way, in order to participate and engage in personal, professional, and societal activities.” (UNESCO, 2013, p.29).

In Higher Education, it is important to consider the development of these competencies, not only within the scope of academic work but also to build the student's skills for the future work context and from a lifelong learning perspective. This is to the extent that the individual will need, on an almost permanent basis, to put into practice the skills developed in the field of IL. To guide work in these various training scenarios, several frameworks and models have also been created. We highlight here, in the context of the experiences analyzed in this article, the *Framework for Information Literacy for Higher Education*, by ACRL (2016), for the coherence, flexibility, and scope of its proposal, which has led to its wide implementation in international terms. The Framework defines IL as a standard of integrated competencies that contemplates the reflective discovery of information, the understanding of how information

is produced and valued, and the use of information in the ethical and legal creation of new knowledge.

Regardless of the concepts or models used, in higher education, it is understood that learning is not viable without IL, that is, without the development of transversal skills that allow students to interact with information in critical and productive ways. It is also essential to create conditions for students to have more meaningful learning experiences that help them understand the various dimensions of the topics studied. To achieve this, it is essential to develop research skills and use information in an appropriate and meaningful way for their academic and professional trajectories.

The specific context that is analyzed in the practical part of this article, linked to the Sustainable Development Goals, will also have a potential impact on students' personal and social development, educational success, personality formation, and autonomy, as well as their way of being and understand the space in which they are inserted (Bawden & Robinson, 2018). It is therefore important to bear in mind that in learning that is intended to be socially situated (Lave & Wenger, 1991), it is necessary to consider that the development of IL skills must have in mind the fields of knowledge in which they will be implemented in practice. A generalist approach has been the subject of discussion by several authors (for example, Grafstein, 2002; Tuominen et al., 2005), who point out that information skills cannot be taught independently of the knowledge domains, organizations, and practical tasks in which these skills are used. This was also the point of view involved in the work carried out with students in the case studies we analyze.

THE SUSTAINABLE DEVELOPMENT GOALS IN HIGHER EDUCATION

The United Nations Member States adopted the 2030 Agenda for Sustainable Development in 2015, which at its core contains the 17 Sustainable Development Goals (SDGs). These goals are related to several challenges that our global society is facing, including poverty and well-being, inequality in various domains, climate change, ecological damage,

and peace and justice (cf. <https://sdgs.un.org/goals>). Every country should be committed to the Agenda and create national strategies to implement the SDGs.

Universities and other higher education institutions have a key role in helping society achieve the SDGs, namely through their research, learning, and teaching (SDSN, 2020). In the European context, for example, in 2018 the University Association published a document with an overview of how universities facilitate social, environmental, and economic development. The most recent strategic plan presented by EUA (2020) also explicitly records its commitment to the implementation of the SDGs. The impact ranking score developed by the Times Higher Education (THE) since 2019, which uses the SDGs to evaluate societal impact, has increased the interest of institutions in the 2030 Agenda and their concern in publicizing actions related to the SDGs. As information, UNESP, one of the universities participating in this study, is ranked 25th in SDG 9 - Industry, Innovation, and Infrastructure (THE, 2023).

Several studies have focused on how these institutions have supported the implementation of the SDGs, recognizing that this action can be carried out in multiple ways (Murillo-Vargas et al., 2020; Serafini et al., 2022) and with varying effects, depending on the institutional approach and the intended purposes (Cuesta-Claros et al., 2023). In particular, the systematic literature review done by Serafini et al. (2022) displays this variety of approaches, showing, among other aspects, how HEIs are incorporating the SDGs in various dimensions of their activities, including management, teaching, research, and outreach. In the analysis carried out, they found that in terms of representation, the area of governance is the most represented, slightly above the area of teaching and, with a less significant presence, the area of research and outreach (p. 11). In this sense, it is particularly pertinent to present studies focused on the actions of teachers and students, and in the present case studies also with a strong connection to dissemination and the wider community.

Specifically about the pedagogical work with students, it is important to remember one of the recommendations presented in the guide *Accelerating Education for the SDGs in Universities* (SDSN, 2020): “To help

learners develop cross-cutting ESDGs skills, competencies, and mindsets, universities will also need to develop new «transformative learning» activities, which employ interdisciplinarity, action-based learning, and multi-actor involvement, and which are not currently standard practice within universities.” (p.vii). It is in this field, for example, that the interdisciplinary and extension activities that are presented in the empirical part of this study are inserted, enabling students to have more direct involvement with the topic studied and with the search for effective ways of making the SDGs addressed closer to the community. The intersection with the development of information literacy skills also gained a more evident experiential dimension, due to the proposed connections between the work carried out and the broader social context, in a more practical and immediate way. In this sense, students were involved in information research, reflective writing, and creation of new knowledge.

METHODOLOGY

The study carried out falls within the so-called exploratory studies. According to Gil (2008), exploratory research aims to provide greater familiarity with the problem, to make it more explicit. With more flexible planning, different aspects can be considered. Our study took also a qualitative and interpretive approach, “attempting to make sense of, or interpret, phenomena in terms of the meanings people bring to them” (Denzin & Lincoln, 2005, p.3). Furthermore, according to Neves (1996, p.1), qualitative research does not seek to enumerate or measure events, it serves to obtain descriptive data that explain the meaning of phenomena. In this same sense, the method used was deductive.

In relation to the scenarios and contexts in which the study took place, it refers to the post-social isolation scenario caused by the COVID-19 pandemic. For our analysis, extension activities carried out at two universities in the city of Bauru, São Paulo, Brazil, were selected. One, in the subject “Interdisciplinary Law Work”, on an extension basis, in a Bachelor of Law program at a private university, and another at the public university Unesp, in a bachelor’s degree in Public Relations, in the

subject “Public Opinion Research Laboratory”. The authors are teachers in the two programs, and the investigation of their practices took place in the semesters of 2022 to 2023, in association with two other researchers.

Subjects and object: the analysis refers to the narration of didactic strategies for the development of IL associated with the theme of the Sustainable Development Goals and the results obtained through the presentation of work carried out by students.

Collection procedures: this research adopts participatory observation carried out by the teacher, who at the same time participates in the pedagogical action and carries out its analysis. Participant observation occurs when the researcher is in contact with the members of the researched group and participates in their normal activities (Marconi & Lakatos, 2018, p.79). Participatory research “[...] is characterized by the interaction between researchers and members of the situations investigated.” (Gil, 2008, p.61). It implicates planned action that can be social, educational, or technical. The study also involves action research, social research carried out in close association with an action or resolution of a collective problem in which researchers and participants are cooperatively involved (Thiollent, 2018). The development of information literacy was observed through practical activities, in which students were able to learn when information is needed and developed the ability to locate, evaluate, and effectively use the required information.

Data analysis instruments: in this case, the authors of the article used the description of teaching-learning strategies to report the development of information literacy skills during the period analyzed. Among the work developed by the students, scientific articles and posts for social networks, communication plans, and the holding of an interdisciplinary event open to the community were analyzed in this study.

RESULTS AND DISCUSSION

The purpose of this article is to demonstrate that, based on research and action activities, the development of desired skills was observed through

the tasks carried out by students in subjects applied to university extension projects in higher education courses at the Faculty of Architecture, Arts, and Communication (FAAC) of São Paulo State University (UNESP) - Bauru, and IESB University. These activities generated a change in skills, with an impact not only on the target audience segment but on the entire community participating in the project. These actions were carried out in the years 2022 to 2023.

It is worth clarifying that university extension establishes a dialogical relationship between university and society, with an emphasis on theory and practice mediation, from the perspective of an exchange of knowledge, essential for student training, teacher qualification, and exchange with society. University extension consists of a space for future professionals to perform in activities whose pedagogical dynamics are part of the process of training and producing knowledge and skills.

ACTIVITIES CARRIED OUT AT UNESP

The Extension is part of UNESP's commitment to creating, preserving, organizing, and transmitting knowledge, art and culture through the inseparability of teaching, research and university extension. Therefore, it is worth highlighting the objectives of the extension, by UNESP Resolution 102, of 11/29/2000, article 8:

I - Integrate teaching and research with the demands of society, seeking the commitment of the university community to the interests and needs of society, at all levels, establishing mechanisms that relate academic knowledge to popular knowledge;

II - Democratize academic knowledge and the effective participation of society in the life of the University;

III - Encourage academic practice that contributes to the development of social and political awareness, training professional citizens;

IV - Critically participate in proposals aimed at regional, economic, social and cultural development;

V - Contribute to reformulations of the University's curricular concepts and practices, as well as to the systematization of the knowledge produced (Universidade Estadual Paulista, 2000).

The pedagogical proposal, mediated by the teachers, was the active search for information about the SDGs, both in digital media and in scientific databases, and physical and digital libraries at the university. Work was carried out to develop skills in IL through discussions on the topic, proposals for solving problems collectively, presentation of projects, discussion of information search strategies, and how to select sources. The discussion with students, based on triggering questions, inquired: Why is the topic important? What is our reality on the subject? Who is most affected by this problem? What do people need to know?

The following skills developed during the activities and projects stand out: a) team information literacy skills; and b) information literacy for the community.

a) Competence in information literacy in a team (internal): From the perspective of active methodology (Bastos, 2006; Berbel, 2011), the teacher acts as a learning mediator based on a pedagogical model that articulates the different contents or subjects, promoting learning comprehensive that contemplates a humanistic, critical and ethical vision.

In this sense, an active, multidisciplinary methodology application was used in the classroom, with a participatory and collaborative approach, to relate different knowledge, subjects, and skills, and expand the analytical and knowledge production capacity of students who dedicated themselves to extension projects. The participants had different obligations and activity plans, but they all experienced the practice of developing responsibilities, rights, duties, and the required professional attitude. Ultimately, the group's social protagonism was exercised when each of the members sought to foresee problems, going beyond the obvious, showed themselves to be proactive when carrying out project tasks

and activities, taking initiative in applying research, contacting audiences and the leader's community members involved in the topics, promptly answered questions correctly and was willing to continually learn.

- b) Competence in information for the community: drawing attention to SDG themes, especially violence against women in the community, can also be considered one of the specific objectives achieved, as this competence was developed through meetings and broad interaction of the students, the teachers who authored this article and the representatives of the Municipal Council for Policies for Women (CMPM) in the city of Bauru, in the interior of the State of São Paulo, the city where the universities involved in the projects are located.

Interviews were carried out with CMPM counselors and managers, support for lives on the topic of violence against women on the council's social networks, disseminating quality information that was also shared by local media (Unesp TV, Unesp FM Radio, and City Newspaper) and between those involved. In this way, we managed to expand also the knowledge and competence of these segments on the topic, due to the credibility, accuracy and security of the data and information shared. Remembering that to disseminate quality information, it is essential to search and select information from reliable sources on the topic, and one of the sources of support for students was the website of the United Nations - UN Women. The steps for developing information literacy were followed by defining the topic; discussing the problem; raising questions; searching, selecting, and classification of information, according to criteria such as timeliness, relevance and origin of the source. Then there was the production of scientific summaries and content for social networks, with information disseminated through university websites.

Figure 1: Publicizing the topic of violence against women on TV Câmara – Bauru.



Source: Print of TV Câmara's YouTube screen. Available at: <https://www.youtube.com/watch?v=t2qjLPyRhis>

Extension activities enable the training of professional citizens and connect the University with the demands of the population in the production of knowledge to overcome social inequalities (Sousa, 2000). As a result, students produced scientific articles and posts, communication plans, and an interdisciplinary event open to the community. They worked as a team and delved deeper into the topic of the SDGs. At the end of the subject “Opinion Research Laboratory”, an event was held to present the results of the communication plans prepared by the students to publicize the topic of violence against women in the community, the event was titled: I Interdisciplinary Seminar on Research and Planning in Public Relations, held on August 18, 2022, at 7 pm, in room 1 of Unesp, Bauru campus, with the presence of members of the community, specifically the counselors of the Bauru Municipal Council for Women’s Policies (CMPM).

Thus, by aiming to collect quality data and information, to contribute to the construction of a society that is competent in information on the topic of violence against women in the city of Bauru, this action developed in the classroom responded to the aspirations of the Sustainable Development Goals. In particular, by providing reliable information on

the topic of violence against women, it met SDG 5. Gender Equality - Achieve gender equality and empower all women and girls; and SDG 16. Peace, Justice, and Strong Institutions - Promote peaceful and inclusive societies, provide access to justice for all, and build effective, responsible, and inclusive institutions at all levels (Organizaçāo das Naçōes Unidas Brasil,-(2015).

Figure 2: Students and faculty organizers of the 1st Interdisciplinary Seminar on Research and Planning in Public Relations.



Source: the authors

ACTIVITIES CARRIED OUT AT IESB UNIVERSITY

The Extension and Social Responsibility Project:

The IESB Law Course, through the subject “Interdisciplinary Integrated Work on Law II”, after deliberation and approval by the Course Board, offered students regularly enrolled in the 4th semester the following extension and social responsibility project: “AGENDA 2030 – Objectives of Sustainable Development”. This plan is ruled by important principles: Leave no one behind; Universality; The integrity and indivisibility of the UN Sustainable Development Goals (SDGs); The inclusive and participatory approach; National appropriation; The approach based on

human rights. Research and a proposal for an informative intervention (informative posts) were suggested, on one or more of the DSGs, with the contextualization of the 2030 Agenda.

ACTIVITIES DEVELOPED:

The strategies applied by teachers in the “Interdisciplinary Law Work” subject focused on: a) The development of Information Literacy skills was carried out in a team (internal): between students and teachers through the Google Classroom platform, with synchronous meetings through the Meet application; b) Competence in information for the community: application of active methodologies, using guided and weekly activities, preparation of reports and informative posts for social networks on the subject covered and presentation of these as part of the semester assessment.

- a) Competence in information literacy as a team (internal): The Google Classroom application can be used on Android and iOS mobile devices. The platform allows the management of teaching and learning, facilitating the organization of student and teacher tasks, increasing collaboration, and facilitating communication. As Moreira *et al.* (2020) point out, the platform enhanced the interaction and collaboration of teachers and students, namely as a flipped classroom. It provided adequate control to the teacher to manage the pace of learning. The authors also considered that the platform must be well presented and explained to students for greater efficiency.

How it was used: Before the class, the teacher shared the activity and supporting material on the platform, and the students accessed the material and solved the pre-class activities. During class, the subject previously studied was discussed and explored in depth with the class.

- b) Competence in information for the community: In all classes, students were asked to carry out activities about the work being

developed. Therefore, the development of a project was proposed, which consisted of:

- 1 - Research and define which SDGs would be studied by each team;
- 2 - Develop a study project;
- 2 - Prepare intermediate reports and a final report;
- 3 - Create an informative post for social media.

For the report about the SDGs, in which each team discussed and researched some of the objectives, research sources were indicated by the teacher, such as articles from scientific journals. Appendix 1 presents the summary of the report prepared.

At the end of the semester, students sent the reports and the informative posts to social networks (figure 3) on the Classroom platform, and made the presentation as part of the subject evaluation, in an Online Event with the participation of all students and course coordination.

Figure 3: Examples of relevant posts prepared by students.



Curtir

Comentar

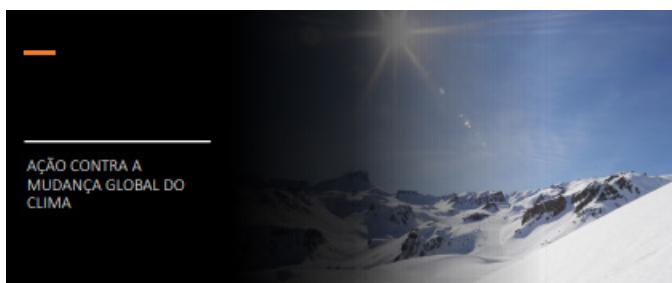
Enviar



• **Definição:** O ODS 3 tem como objetivo "assegurar uma vida saudável e promover o bem-estar para todos, em todas as idades". Ele aborda uma variedade de questões de saúde, desde a redução da mortalidade infantil até o combate a doenças infecciosas e a promoção da saúde mental.

• **Medidas de Solução:**

- **Redução da Mortalidade Infantil e Materna:**
 - Implementação de cuidados de saúde materna e infantil acessíveis e de qualidade.
 - Promoção de práticas seguras de parto e apoio pré-natal.
- **Combate a Epidemias e Doenças Transmissíveis:**
 - Prevenção, tratamento e controle de doenças como HIV/AIDS, malária e tuberculose.
 - Reforço de sistemas de saúde para responder a emergências de saúde pública.
- **Saúde Mental e Bem-Estar:**
 - Promoção da saúde mental e prevenção de transtornos mentais.
 - Acesso a serviços de saúde mental e apoio comunitário.



AÇÃO CONTRA A
MUDANÇA GLOBAL DO
CLIMA

Definição: O ODS 13 tem como objetivo "tomar medidas urgentes para combater a mudança do clima e seus impactos". Ele reconhece a importância de contar o aumento da temperatura global, adaptar-se aos efeitos já em andamento e promover esforços para fortalecer a resiliência e a capacidade de adaptação.

Medidas de Solução:

Mitigação das Emissões de Gases de Efeito Estufa (GEE):
Promoção de fontes de energia renovável e eficiência energética.
Transição para práticas agrícolas sustentáveis e florestamento.

Adaptação às Mudanças Climáticas:
Desenvolvimento e implementação de estratégias de adaptação em setores vulneráveis.
Construção de infraestrutura resiliente às mudanças climáticas.

Educação e Conscientização:
Sensibilização sobre os impactos da mudança climática e a importância de ações individuais e coletivas.
Educação sobre práticas sustentáveis e a necessidade de reduzir a pegada de carbono.

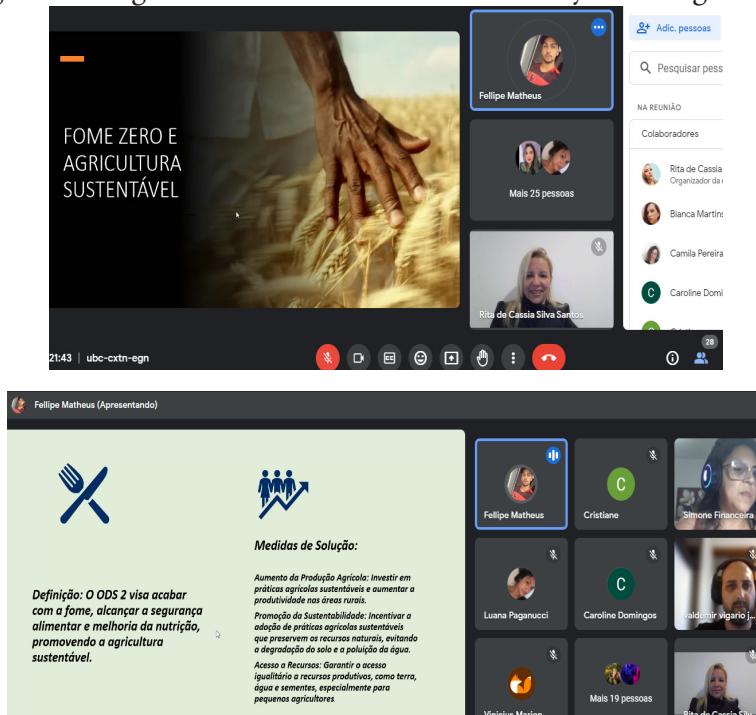


Source: Selection prepared by the authors (2023).

The images included here are visual indicators of the outcomes achieved through the university extension activities focused on developing information literacy (IL) skills in alignment with the Sustainable Development Goals (SDGs). They illustrate the practical application of the knowledge and skills gained by students, highlighting examples of projects and actions undertaken in an autonomous way, and with a dissemination in the local community. These examples of students work not only validate the effectiveness of the pedagogical approaches employed but also emphasize the importance of connecting higher education with contemporary social issues and needs.

Below (figure 4) are some images from the day of the TIID 2023 presentations. They were carried out remotely, via Google Meet, and had the participation of students, the teacher, and the course coordinator.

Figure 4: Images of the Presentation held remotely via Google Meet.



Source: Prepared by the authors (2023).

The results found, through the analysis of the work presented by the students, demonstrated that the proposed activities provided active learning in the search and use of information. Information literacy was exercised appropriately and contributed to making students more autonomous. The teacher acted as a mediator, facilitating the understanding of a topic in the classroom, promoting access to reliable information, meeting informational needs, encouraging dialogue and the mutual construction of knowledge, which is of paramount importance in the context of today's society called the Knowledge Society. Other aspects of the study carried out are that the students experienced dynamic learning, outside the standard format of face-to-face classes, encouraging the students to develop their knowledge through research and search for information.

SUMMARY OF THE WORK CARRIED OUT AT THE TWO UNIVERSITIES

These actions culminated in the recognition of the students' relationships as subjects in the studied environment, the understanding of available resources, and the purposes and perceptions sought by the other actors involved, adding new knowledge. Thus, students' competence, understood as a set of knowledge, skills, and attitudes (individual), was also modified.

Students' work in extension projects certainly develops information literacy skills, by doing research and disseminating significant information and data to develop skills on the topic, adapting them to the community's priorities and suggestions. The promotion of the topic of violence against women on TV Câmara in Bauru (cf. Figure 1) also exemplifies the students' ability to utilize media channels to raise public awareness on critical issues, supported by reliable data and accurate information.

In addition, and within the perspective of action research, the teachers were constantly evaluating the development of the students' learning process and introducing the necessary changes, to achieve the intended learning objectives. This aspect is particularly important, considering the context experienced during the first phase of this process, which triggered

the changes introduced in the subjects, specifically the constraints caused by the COVID-19 pandemic.

It should also be noted that the implemented strategies were motivated by the conditions imposed by COVID-19 but continued after that moment. This is because they proved to be an important asset for pedagogical work in the subjects, increasing students' autonomy and the development of IL skills but with a strong component of practical and social connection, which went far beyond what was initially expected.

FINAL REFLECTIONS

Having in mind that knowledge, in general, is what is known about something, acquired through theories, practices, experiences, and relationships, among others, it is observed that a certain intentional act – the performance of students in extension projects – generates the transformation of data into information and, certainly, produces added knowledge. The work process that was followed was related to a pedagogy of inquiry, associated with the development of IL skills. The collaborative work between students and the communication of results to the community (in the case of UNESP) and a wider public, through social networks (in the case of IESB), made students more aware of the acquired skills and the importance and value of the performed tasks.

As explained by Cuesta-Claros et al. (2023), the interest of universities in the SDGs is increasing, but “questions remain about the influence of the SDGs on university transformations” (p. 1). Even on a micro scale, as it happens in the presented case studies, it can be pointed out that these small steps act at several levels: first, in an alignment of the curriculum with the SDGs, through the subjects worked on, leading to students become more aware of the topic and the potential for intervention in the areas covered; and second, in an involvement with the “third space”, that is, with the community, contributing to an increased awareness of the social reach of the SDGs. Active Learning, carried out with a combination of research (training competencies in IL) and action-oriented practices

became more productive and effective, making students critical thinkers and action-takers, like the cases reported here.

Therefore, the active participation of both students and teachers in extension projects and contact with the community is highlighted. Finally, the emphasis on the connection to local issues and the dissemination of actions in the local and regional media, disseminating quality information, contributed to the construction of information and learning skills more broadly, and reaching a greater number of individuals, for example, on the topic of violence against women in the city of Bauru-SP, Brazil.

REFERENCES

American Library Association. (1989). *ALA: American Library Association Presidential Committee on Information Literacy: Final Report*. <http://www.ala.org/acrl/publications/whitepapers/presidential>

Association of College & Research Libraries. (2016). *Framework for Information Literacy for Higher Education*. American Library Association. <https://www.ala.org/acrl/standards/ilframework>.

Bastos, C. C. (2006, fevereiro 24). Metodologias Ativas. *Educação e Medicina*. <http://educacaoemedicina.blogspot.com.br/2006/02/metodologias-ativas.html>

Berbel, N. A. N. (2011). As metodologias ativas e a promoção da autonomia de estudantes. *Seminário: Ciências Sociais e Humanas*, 32(1), 25-40.

Bawden, D., & Robinson, L. (2018). International good practice in information literacy education. *Knjižnica: Revija za Področje Bibliotekarstva in Informacijske Znanosti*, 62(1-2), 169-185 <https://openaccess.city.ac.uk/id/eprint/19385/>

Belluzzo, R. C. B. (2017). Bases teóricas de gestão da informação: Das origens aos desafios na sociedade contemporânea. *Palabra Clave (La Plata)*, 7(1), 1-12. http://www.memoria.fahce.unlp.edu.ar/art_revistas/pr.7975/pr.7975.pdf

Cuesta-Claros, A., Malekpour, S., Raven, R., & Kestin, T. (2023). Are the sustainable development goals transforming universities?: An analysis of steering effects and depth of change. *Earth System Governance*, 17. <https://doi.org/10.1016/j.esg.2023.100186>

Denzin, N. K., & Lincoln, Y. S. (2005). *The Sage Handbook of Qualitative Research* (3rd ed.). Sage.

Dias, M. M. K., & Belluzzo, R. C. B. (2003). *Gestão da Informação em ciência e tecnologia sob a ótica do cliente*. EDUSC.

European University Association (2018). *Universities and Sustainable Development. Towards the Global Goals*. EUA. <https://eua.eu/resources/publications/798:universities-and-sustainable-development-towards-the-global-goals.html>

European University Association (2020). *Europe's universities shaping the future: EUA strategic plan*. EUA. <https://eua.eu/resources/publications/931:europa%20%99s-universities-shaping-the-future.html>

Fleury, M. T. L., & Fleury, A. (2001). Construindo o conceito de competências. *Revista de Administração Contemporânea*, edição especial, 183-196.

Fleury, M. T. L., & Lacombe, B. M. B. (2003). *A Gestão por Competências e a Gestão de Pessoas: Um balanço preliminar de resultados de pesquisa no contexto brasileiro*. Anais do III Encontro da Iberoamerican Academy of Management. Iberoamerican Academy of Management, São Paulo.

Gil, A. C. (2008). *Métodos e técnicas de pesquisa social* (6th ed.). Atlas.

Grafstein, A. (2002). A subject-based approach to Information Literacy. *Journal of Academic Librarianship*, 28(4), 197–204. [https://doi.org/10.1016/S0099-1333\(02\)00283-5](https://doi.org/10.1016/S0099-1333(02)00283-5)

Hirata, H. (1994). Da polarização das qualificações ao modelo de competência. In C. J. Ferretti, D. M. L. Zibas, F. Madeira & M. L. P. B Franco (Org.), *Novas tecnologias, trabalho e educação* (pp. 128-142). Vozes.

Lave, J., & Wenger, E. (1991). *Situated learning: Legitimate peripheral participation*. Cambridge University Press.

Marconi, A. M. D., & Lakatos, M. E. (2018). *Técnicas de pesquisa* (8th ed.). Atlas. <https://integrada.minhabiblioteca.com.br/#/books/9788597013535/>

Moreira, M. E. S., da Silva Cruz, I. L., Sales, M. E. N., Moreira, N. I. T., de Castro Freire, H., Martins, G. A., & Popolim, R. S. (2020). Metodologias e tecnologias para educação em tempos de pandemia COVID-19/Methodologies and technologies for education in times of pandemic COVID-19. *Brazilian Journal of Health Review*, 3(3), 6281-6290. doi: 10.34119/bjhrv3n3-180.

Murillo-Vargas, G., Gonzalez-Campo, C. H., & Brath, D. I. (2020). Mapping the integration of the sustainable development goals in universities: is it a field of study. *Journal of Teacher Education for Sustainability*, 22, 7–25. <https://doi.org/10.2478/jtes-2020-0013>

Neves, J. L. (1996). Pesquisa Qualitativa: Características e possibilidades. *Caderno de Pesquisas em Administração*, 1(3), 1-5. https://www.hugoribeiro.com.br/biblioteca-digital/NEVES-Pesquisa_Qualitativa.pdf

Organização das Nações Unidas Brasil. (2015). *Conheça os novos 17 objetivos de desenvolvimento sustentável da ONU*. <https://nacoesunidas.org/conheca-os-novos-17-objetivos-de-desenvolvimento-sustentavel-da-onu/>

Perrenoud, P. (1999). *Construir as competências desde a escola*. Artes Médicas Sul.

Porter, M. E. (1991). Towards a dynamic theory of strategy. *Strategic Management Journal*, 12, 95-117. <https://doi.org/10.1002/smj.4250121008>

Serafini, P. G., Moura, J. M. de, Almeida, M. R. de, & Rezende, J. F. D. (2022). Sustainable development goals in higher education institutions: A systematic literature review. *Journal of Cleaner Production*, 370, 1-20. <https://doi.org/10.1016/j.jclepro.2022.133473>

Sousa, A. L. L. (2000). *A história da extensão universitária*. Alínea.

Sustainable Development Solutions Network. (2020). *Accelerating Education for the SDGs in Universities: A guide for universities, colleges, and tertiary and higher education institutions*. Sustainable Development Solutions Network (SDSN).

Takahashi, A. R. W., & Fischer, A. L. (2009). Aprendizagem e competências organizacionais em instituições de educação tecnológica: estudos de caso. *Revista de Administração (RAdm)*, 44(4), 327-341.

Tuominen, K., Savolainen, R., & Talja, S. (2005). Information Literacy as a sociotechnical practice. *Library Quarterly*, 75(3), 329-345. <https://doi.org/10.1086/497311>

The Times Higher Education. (2023). *Impact Rankings 2023*. <https://www.timeshighereducation.com/impactrankings>

Thiollent, M. (2018). *Metodologia da pesquisa-ação* (18a. ed.). Cortez.

Universidade Estadual Paulista. (2000). *UNESP's commitment to creating, preserving, organizing, and transmitting knowledge*. https://www2.unesp.br/downloadProtegido.php?arq=Home/proex/guia_extensao2012.pdf

UNESCO. (2013). *Global media and information literacy assessment framework: Country readiness and competencies*. UNESCO. <https://uis.unesco.org/sites/default/files/documents/global-media-and-information-literacy-assessment-framework-country-readiness-and-competencies-2013-en.pdf>

Valentim, M. (2008). *Gestão da informação e do conhecimento*. Cultura Acadêmica.

Wernerfelt, B. (1984). A resource-based view of the firm. *Strategic Management Journal*, 5(2), 171-180.

Appendix 1

Report template requested from students. Source: the authors (2023).

PLANO DE ATIVIDADES	
1. Título: "AGENDA 2030 – OBJETIVOS DE DESENVOLVIMENTO SUSTENTÁVEL".	
2. Justificativa: Muitas pessoas são vítimas de Violência Psicológica. Essa realidade decorre de diversos fatores: precariedade na educação, dificuldades financeiras, ineficiência das ferramentas processuais. Essas dificuldades resultam em estatísticas inaceitáveis.	
3. Objetivos (Gerais e Específicos)	
Geral: Atrair a atenção para o tema Específicos: Estudar a Agenda 2030 e os ODS. - Apontar os aspectos positivos. - Enaltecer a contribuição do trabalho e do tema para a sociedade. - Expor as consequências (negativas) que a falta de reflexão sobre o assunto abordado pode causar.	
4. Relevância Social: Contribuir para a Agenda 2030; auxiliar no conhecimento sobre a proposta deste plano. São questões pertinentes à atualidade do mundo, sendo de interesse de todos os países, da população. Está relacionado aos problemas emergentes na sociedade.	
5. Atividades de extensão a serem desenvolvidas (breve resumo) - Como e porque os ODS foram criados. - O que é Desenvolvimento Sustentável. - Qual a importância da Agenda 2030 e os ODS; - Em que consistem os ODS; - Quem pode contribuir para os ODS.	
6. Fundamentação Teórica ou Estado da Arte	
Colocar aqui as definições sobre o Tema e o que foi encontrado nas pesquisas realizadas no ITEM 5. SEMPRE ACOMPANHADAS DAS DEVIDAS REFERÊNCIAS (FONTE DAS PESQUISAS).	

7. Público-alvo:																																													
Comunidade em geral.																																													
8. Metodologia																																													
Uma abordagem exploratória. O principal objetivo é desenvolver familiaridade com o tema de forma a entender a importância do Tema, bem como, alcançar conhecimento sobre a legislação pertinente.																																													
9. Resultados Esperados																																													
(descrever objetivamente quais resultados espera encontrar)																																													
10. Equipe de Trabalho																																													
11. Recursos Materiais																																													
12. Cronograma																																													
<table border="1"><thead><tr><th rowspan="2">ETAPAS</th><th rowspan="2">MAR</th><th rowspan="2">ABR</th><th rowspan="2">MAI</th><th rowspan="2">JUN</th></tr></thead><tbody><tr><td>1- Redação do Plano de Atividade</td><td></td><td></td><td></td><td></td></tr><tr><td>2- Envio do Plano para a Coordenação</td><td></td><td></td><td></td><td></td></tr><tr><td>3- Coleta de dados</td><td></td><td></td><td></td><td></td></tr><tr><td>4- Análise dos dados</td><td></td><td></td><td></td><td></td></tr><tr><td>5- Início das Atividades de Extensão</td><td></td><td></td><td></td><td></td></tr><tr><td>6- Realização das Atividades de Extensão</td><td></td><td></td><td></td><td></td></tr><tr><td>7- Término das Atividades de Extensão</td><td></td><td></td><td></td><td></td></tr><tr><td>8- Entrega dos Relatórios</td><td></td><td></td><td></td><td></td></tr></tbody></table>	ETAPAS	MAR	ABR	MAI	JUN	1- Redação do Plano de Atividade					2- Envio do Plano para a Coordenação					3- Coleta de dados					4- Análise dos dados					5- Início das Atividades de Extensão					6- Realização das Atividades de Extensão					7- Término das Atividades de Extensão					8- Entrega dos Relatórios				
ETAPAS						MAR	ABR	MAI	JUN																																				
	1- Redação do Plano de Atividade																																												
2- Envio do Plano para a Coordenação																																													
3- Coleta de dados																																													
4- Análise dos dados																																													
5- Início das Atividades de Extensão																																													
6- Realização das Atividades de Extensão																																													
7- Término das Atividades de Extensão																																													
8- Entrega dos Relatórios																																													
13. Referências Bibliográficas																																													
Nome do(s) aluno(s):	Assinatura:																																												

Bauru/SP, ____ de _____ de 2023.

University extension as a field for information literacy actions for sustainability

*Marianna Zattar*¹

*Nysia Oliveira de Sá*²

*Alberto Calil Elias Junior*³

Abstract: This text presents a university extension project at the Universidade Federal do Rio de Janeiro, in partnership, focusing on informational and educational initiatives, referred to as information literacy in Brazil. The project is based on the proposals of Agenda 2030 and its Sustainable Development Goals and is being developed with the community of young people who are in high school, both in public and private schools in the city of Rio de Janeiro. They participate as scholarship recipients in the Scientific Vocation of the Escola Politécnica de Saúde Joaquim Venâncio at Fiocruz as part of their Scientific Initiation. The initiative aims to promote information literacy as the clue to the fight against disinformation based on the principle of dialogicity between this project and the contemporary information ecosystem, as both are constructed through social interactions. In this perspective, the interlocution between theory and practice in the critical, ethical and solidary evaluation of information sources is highlighted. It anticipates, as a result, that the informational actions enable an exchange of knowledge and experiences among all participants, raising awareness about the need for civic engagement in issues related to sustainable development. Ultimately, through information education, the aim is to combat disinformation practices.

Keywords: Information literacy, University extension, Information practices, Sustainability.

¹ Universidade Federal do Rio de Janeiro, Rio de Janeiro, Brasil.
E-mail: mzattar@facc.ufrj.br | ORCID iD <https://orcid.org/0000-0002-3328-3591>

² Universidade Federal do Rio de Janeiro, Rio de Janeiro, Brasil.
E-mail: nysia@facc.ufrj.br | ORCID iD <https://orcid.org/0000-0001-9186-5920>

³ Universidade Federal do Estado do Rio de Janeiro, Rio de Janeiro, Brasil.
E-mail: caliljr@unirio.br | ORCID iD <https://orcid.org/0000-0002-5414-2165>

<https://doi.org/10.36311/2025.978-65-5954-624-4.p315-332>

INTRODUCTION

In the period spanning November to December 2023, the 28th UN Conference of the Parties (COP 28) on climate change was held in Dubai, United Arab Emirates. In order to deliberate upon solutions and propose actions aimed at addressing the impacts of the climate crisis, representatives from governments worldwide convened at a Conference fraught with contradictions. This is evident from the selection of the host country, one of the foremost producers of fossil fuels globally, whose production and consumption serve as significant catalysts for climate collapse.

Amidst the myriad contradictions, a noteworthy instance, particularly observed by some in Brazilian territories, was the announcement of Braskem's participation in COP28. Alongside other Brazilian companies, Braskem intended to leverage the Conference to showcase its conscientious and sustainable initiatives. The presence of this petrochemical sector company at COP28 is particularly striking, given that in the same week, entire neighborhoods in Maceió, Alagoas, were being evacuated due to Braskem's mining activities in the city (Vidal, 2023; Angelo, 2023).

In a report published by Revista Fórum, Iara Vidal highlights that in 2018, because of mining activities, seismic events and ground subsidence started to transpire in various neighborhoods of Maceió. Since then, over 200 thousand individuals have been displaced from their homes. Nevertheless, this did not deter Braskem from sponsoring cultural industry events, such as Lollapalooza or Big Brother Brasil, with the purported aim of promoting sustainable practices (Vidal, 2023).

Such contradictions are inherent in the daily dynamics of capitalist societies, and it is not the aim of this work to conduct a detailed analysis of these contradictions. However, cases like that of Braskem serve as “clues” for engaging in a dialogical exercise regarding our infocommunication practices. For the purposes of the proposed reflections here, some of the motivating questions revolve around the possibilities for a critical reading by the population that consumes sustainable narratives from actors (companies, governments, individuals) whose practices contribute to climate collapse. How is a sustainable discourse from an extractive

company, whose actions cause the destruction of thousands of lives in a capital city, accepted? Why is the organization of a Climate Conference in a country whose economy is based on fossil fuel extraction normalized? Whether in the Brazilian context or internationally, there appear to be discrepancies between the proclaimed and consumed discourses and the practices concerning sustainable actions.

The starting point is the assumption that we are facing a polycrisis (Fernandes, 2023) that manifests itself in different dimensions, with a particular emphasis on the deepening of socioeconomic inequalities, the current infodemic, and the interrelated climate crisis (Zattar et al., 2022). The discourse on climate collapse, sustainability, and actions seeking to mitigate its effects and adapt cities and societies are directly linked to discussions on inequalities and current infocommunication practices. This connection is established through communicational and mediatic infrastructures that facilitate the circulation of misinformation.

The current polycrisis scenario poses challenges for various institutions, including universities. What are the potential avenues for universities to engage with issues affecting the daily lives of populations? In what ways do universities dialogue with these challenges?

One of the hallmarks of the Brazilian Public University is the integration of the so-called tripod, involving research, teaching, and extension, manifested through the discursive formulation of inseparability. The emergence of university extension in public higher education institutions in Brazil is the result of a prolonged process of reflections and debates, institutionalized in 1996, which recognizes the inseparability of teaching, research, and extension. It is important to highlight that university extension is not detached from research and teaching; however, it differs in its approach by engaging directly with the non-academic community. In addition to expanding the disciplinary boundaries of student education, university extension enables social transformations by acting directly in various territories.

Meanwhile, concerning prevalent discursive formulations in contemporaneity, the discourse surrounding sustainability, the United

Nations' (UN) Agenda 2030, and its Sustainable Development Goals (SDGs) have gained prominence in the public sphere of universities and the realm of libraries and other information agents. In the case of libraries, it is noteworthy that the inclusion of these themes in discussions is one of the outcomes of collaborations between the International Federation of Library Association (IFLA) and the UN, as manifested in Brazil by the Federação Brasileira de Associações de Bibliotecários, Cientistas de Informação e Instituições (FEBAB). In 2017, the Congresso Brasileiro de Biblioteconomia e Documentação (CBBB), one of the most significant events in the field of Librarianship in the country, centered its theme on "United Nations Sustainable Development: How libraries can contribute to the implementation of Agenda 2030" (Geraldo & Pinto, 2021).

The Agenda 2030 is a global action plan that aims, through 17 thematic objectives, to achieve sustainable development. This proposal is related to the notion of misinformation in various phenomena and manifestations, while scientific denialism, false testimony, hate speech, fake news, and post-truth become part of the infocommunicational ecosystem. Discursive disputes within this ecosystem influence and are influenced by preferences characterized by a lack of environmental commitment and power struggles.

Considering that issues surrounding climate collapse and the pursuit of sustainable actions are critical in the current historical moment, coupled with the objectives of SDG 4 - Quality Education, particularly target 4.7, which aims to ensure that everyone acquires the knowledge and skills necessary to promote sustainable development, this articulation through the development of research and extension projects, especially in public higher education institutions, seeks to emphasize the importance of education as a public good.

In this context, the extension project "Educação em informação no combate à desinformação" is introduced, aiming to promote information literacy in the fight against disinformation based on the principle of dialogicity of the project and information, since both are constructed through social interaction. In a scenario of worsening climate crisis, it allows the fight against disinformation, including in the climate context,

as it seeks to stimulate informational dynamics (such as search, retrieval, and production of information) in a critical, ethical, and supportive way. Indirectly, it is expected to contribute to place the theme at the center of debates, both in public and private spheres.

The “Educação em informação no combate à desinformação” project is part of the extension activities of the Curso de Biblioteconomia e Gestão de Unidades de Informação da Universidade Federal do Rio de Janeiro(CBG/UFRJ). It involves faculty and librarians from collaborating institutions for the development of thematic sessions, including the Universidade Federal Fluminense (UFF), Universidade Federal do Estado do Rio de Janeiro (UNIRIO), Instituto Brasileiro de Informação em Ciência e Tecnologia (IBICT), and the Rede Baixada Literária. The project team also includes faculty, student fellows, and volunteers from CBG, as well as professional librarians from FIOCRUZ, an institution established in 1900 and affiliated with the Ministério da Saúde no Brasil. FIOCRUZ stands out in the field of health science and technology in Latin America. The project aims to incorporate interdisciplinary, multidisciplinary, and transdisciplinary dynamics through the involvement of various stakeholders, thus surpassing disciplinary knowledge by integrating diverse perspectives and expertise in the project’s construction and the knowledge it seeks to propose. Thus, this article aims to present the aforementioned extension project and discuss the urgency of actions aimed at information education, with a view to confronting the growing wave of disinformation in Brazilian society.

EXTENSION IN HIGHER EDUCATION

In Brazil, as noted by Paula (2013), university extension has been outlined in our education system since 1931, through Decree No. 19,851 of 11/04/1931, which established the foundations of the Brazilian university system. However, the Decree does not explicitly mention extension as a university function, limiting itself to the dissemination of research, with a focus on elites (Gadotti, 2017). Subsequently, both the Reforma Universitária de 1968 - Lei nº 5.540/1968 , and the 1988 Constitution, in

Article 207 (Brasil, 1988), as well as the 1996 Lei de Diretrizes e Bases da Educação (Brasil 1996) assert and reinforce the inseparability of teaching, research, and extension.

University extension is an integral part of the tripod, alongside teaching and research, comprising the actions and concerns of the university and university education. This is because, on the one hand, it recognizes that the university is not self-sufficient in knowledge construction, and on the other hand, it is expected that the university is not detached from society. Thus, some challenges for universities in the current historical moment are highlighted. On one hand, there is a need to secure the concrete material conditions to provide comprehensive education to individuals, motivating them to transform reality (Santos, 2010; Calil Junior et al, 2021). On the other hand, it involves embracing university extension as “a two-way path between University and Society, the meeting place between academic knowledge and various forms of popular knowledge” (Gadotti, 2017).

As reported by Moacir Gadotti (2017), historically in Brazil, university extension has been situated within a field of tensions between two models: one that carries an assistentialist understanding of extension and the other that points towards the opposite, a non assistentialist view. According to Gadotti (2017), in one form, university extension is seen as an action of transmitting knowledge from those who supposedly possess it (academic knowledge) to those who lack it (communities external to the university). In this perspective, extension plays the role of an assistentialist service, a one-way path from universities to communities.

On the other hand, the second perspective is inspired by and aligns with the proposal formulated by Paulo Freire, considering the concept of extension from the perspective of communication. In this view, extension is understood as “communication of knowledge. It is a non-assistentialist, non-extensionist vision of University Extension” (Gadotti, 2017).

Moreover, university extension appears as the weakest link in the Brazilian higher education system, reflecting a field of tensions and disputes around different projects for higher education in the country. Chauí (2003) points out that, from a historical perspective, it is possible

to assert the Public University as a social institution associated with the ideas of democracy and the democratization of knowledge. However, it is noticeable that throughout the 20th century, the idea of the public university as a social organization focused on service provision gains strength as a model to be adopted.

Extensionist practices are not detached from the struggles and tensions present in universities and society at large. In this perspective, it is urgent to consider these practices in relation to the prevalent information ecosystems, as the information and misinformation circulating within and between these ecosystems impact the meanings attributed to the world and the relationships established. Thus, it is possible to assert that current practices of producing, circulating, and consuming misinformation, as well as the emergence of denialist discourses and the constant and growing attacks on scientific knowledge, are part of and align with the ongoing project of attempting to (re)adjust and (re)arrange the capitalist mode of production. In this context, there are movements towards (re)signifying concepts and practices, such as the notions of “social rights” and “public goods” (Calil Junior et al., 2021).

In the face of this scenario, extension projects gain significance as they enable public universities to reclaim channels of communication and dialogue with popular knowledge. As reminded by Florestan Fernandes in writings from the 1970s, amidst the Brazilian university reform of 1968, universities should not distance themselves from the youth, separating them from processes of social reconstruction. According to the author, the university should serve as a hub for conscious and responsible social participation, where dialogues with society and diverse social groups become crucial in seeking collective solutions for the climate emergency and sustainable development (Calil Junior et al., 2021).

PROJECT

The project is coordinated by the *Curso de Biblioteconomia e Gestão de Unidades de Informação* (CBG) from the *Universidade Federal do Rio de Janeiro* (CBG) in partnership with individuals affiliated with the

Rede de Competência em Informação do estado do Rio de Janeiro (Rede CoInfo). The collaborators represent the Escola de Biblioteconomia (EB) and Programa de Pós-Graduação em Biblioteconomia (PPGB) at the Universidade Federal do Estado do Rio de Janeiro (UNIRIO), the Centro de Filosofia e Ciências Humanas (CFCH), the Programa de Pós-graduação em Educação (PPGE) at UFRJ, the Departamento de Ciência da Informação (GCI), the Programa de Pós-Graduação em Ciência da Informação (PPGCI), the Departamento de Comunicação Social, and the Programa de Pós-Graduação Mídia e Cotidiano from the Universidade Federal Fluminense (UFF).

Additionally, partners include the Instituto Brasileiro de Informação em Ciência e Tecnologia (IBICT) with its respective Programa de Pós-Graduação em Ciência da Informação (PPGCI), the Coordenação de Articulação, Geração e Aplicação de Tecnologia (COTEC), the Fundação Getúlio Vargas (FGV), the Rede Baixada Literária, and the Instituto de Comunicação e Informação Científica e Tecnológica em Saúde (Icict) of the Fundação Oswaldo Cruz (Fiocruz). All partnerships involve collaboration in planning and participating in thematic sessions.

Also, there is a connection with the research project “Avaliação da informação pelo nativo digital” within the Scientific Initiation Program (2022/2024), the university extension event “Fórum sobre Competência em Informação: pesquisas e práticas no Rio de Janeiro,” and the research group “Laboratório de Competência em Informação – LabCoInfo/CNPq.”

The concept of information literacy as a starting point draws on the theoretical and practical dimensions of information literacy but goes beyond by considering information as a social action. It also relates to sustainable development by promoting critical and ethical information practices enabled by solidarity and harmony in social relations. Based on these relationships, this project aims to promote information literacy in combating disinformation, grounded in the principle of dialogicity in both the project and information, as they are constructed through social interaction. The expectation is that criticism in different information actions can help avoid misinformation by recognizing the complexity of the current informational context, problematizing the citizen's perspective

in the informational sphere, and encouraging information practices that encompass critical thinking and ethics.

The activities were offered to sixty high school students from 15 educational institutions in the state of Rio de Janeiro, affiliated with 60 scientific initiation projects part of the Programa de Vocaçāo Científica (Provoc) of the Escola Politécnica de Saúde Joaquim Venâncio (EPSJV)/ Fundação Oswaldo Cruz(Fiocruz). It is noteworthy that the students are adolescents and young people (between 14 and 19 years old), and the Provoc is an educational proposal for Scientific Initiation (SI) in the health field for young people. One of the main objectives of SI conducted by Provoc is to stimulate the learning of technical and scientific knowledge through research practice. Established in March 1986 at the Fundação Oswaldo Cruz (Fiocruz) campus in Manguinhos, it has always been coordinated by the Escola Politécnica de Saúde Joaquim Venâncio (EPSJV). Currently, it includes all technical-scientific units of the Foundation, even regional ones, working with about 60 adolescents and young people in each new class who have educational ties to federal, state, and private schools.

The development of the project within the community has a total time commitment of 30 hours, with 24 hours dedicated to thematic sessions to be held in person on Thursdays between 2 pm and 5 pm from August 2023 to July 2024. The remaining hours are allocated to the evaluation process.

As previously mentioned, it is important to highlight that the project is linked to the research project “Avaliação da informação pelo nativo digital” and the university extension event “Fórum sobre Competência em Informação,” which in 2023 focused on “Literacies and information practices in health: dialogues and knowledge” in its ninth edition. It is also associated with the research group “Laboratório de Competência em Informação – LabCoInfo.” Both research and university extension projects, along with the research group registered in the Diretório de Grupos de Pesquisa do Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq), are coordinated and led by Professors Nysia Oliveira de Sá and Marianna Zattar.

The project also relates to the research project “Práticas infocomunicacionais e ações de competência em informação em territórios de in/exclusão: as bibliotecas e as crise contemporâneas do capitalismo em tempos de desordem informacional” and the extension project “Círculos de estudos como prática política: percursos de saberes em contextos de desinformação,” both coordinated by Professor Alberto Calil Junior.

It is noteworthy that the Forum is an event organized by the Rede de Competência em Informação do estado do Rio de Janeiro (Rede CoInfo), created in 2018 to bring together individuals from different institutions with the aim of sharing research and promoting information literacy practices in Rio de Janeiro. It is also essential to know that the ninth edition of the event took place in a hybrid format, allowing both in-person and remote participation. The Forum was part of the XVII Encontro da Rede de Bibliotecas da Fiocruz e da Semana Brasileira de Educação Midiática . The Week is part of the formulation project of the Estratégia Brasileira de Educação Midiática (EBEM) to consolidate the field of Media Education as a public policy of the State. The federal government commits to recognizing that citizenship involves building a safer and more reliable digital environment.

The structuring of the sessions on different themes, guided by dialogues and relationships among the contemporary and undergraduate and graduate students, librarians), the PROVOC youth, and the Fiocruz library team, facilitated the articulation between information literacy, the issue of disinformation (in its various nuances), and the contemporary issues. Thus, the schedule was organized as follows:

Table 1: Project Activities

Topic	Points addressed	By	Research interests
Research and Science	Discussion on the definition and role of science and research, along with an introduction to the principles of scientific communication.	Robson Santos Costa (CBG-UFRJ) Nysia Oliveira de Sá (CBG - UFRJ)	Social memory, discursive genres, comic books, cinema, culture, information sources, documentary classification systems, information literacy. Reference Service. Information sources. Information education. Information literacy.
Information and disinformation	Presentation of the concepts that constitute the scope of misinformation and promotion of solidarity practices in informational dynamics.	Marianna Zattar (CBG-UFRJ) Isadora Cristal de Souza e Silva Escalante (Rede Baixada Literária e PPGCI IBICT/UFRJ)	Information education. Misinformation. Information sources. Information literacy. Community Libraries. Information practices. Information literacy. Community studies. Gender studies. Cultural policies.
Forum on Information Literacy.	Health Literacies and Information Practices: Dialogues and Knowledge	Rede CoInfo	Individuals from diverse institutions with the aim of sharing research and promoting information literacy practices in Rio de Janeiro.
Search, retrieval, and evaluation of information.	Presentation on the development of search strategies. Discussion on the use of communication and information technologies and artificial intelligence in the context of knowledge production.	Simone Faury Dib (ICICT-Fiocruz) Érica Resende (CFCH-UFRJ/ PPGE-UFRJ)	Research libraries in health. Library administration. Management and sharing of research data. Information literacy. Bibliographic normalization. History of libraries. Reference services. University libraries. Information literacy.

Living in the bubble: algorithms and internet addiction.	Presentation of infocommunicational structures from the perspective of critical information theory.	Arthur Coelho Bezerra (IBICT)	Critical theory of information. Information ethics. Political economy of information. Misinformation. Critical information literacy.
		Marco André Feldman Schneider (IBICT e UFF).	Information ethics. Political economy of information. Misinformation. Critical information literacy.
Documentary standardization, ethics, and plagiarism in research.	Recognition of patterns for research presentation. Discussion on plagiarism and research ethics.	Simone Faury Dib (ICICT-Fiocruz) Érica Resende (CFCH UFRJ/PPGE UFRJ).	Research libraries in health. Library administration. Management and sharing of research data. Information literacy. Bibliographic normalization. History of libraries. Reference services. University libraries. Information literacy.
Research data.	Discussion on the trajectory of scientific research from the perspective of data storage, use, reuse, and sharing.	Marcelle Costal de Castro dos Santos (FGV/ COTEC-IBICT) Antonio Victor Rodrigues Botão (CBG-UFRJ)	Organization of knowledge. Controlled vocabularies. Thesaurus. Research data management. Information literacy. Organizational Content Management. Knowledge Information Management. Document Management. Information Professional Competencies. Archivology and its applications.

Climate urgency and information.	Discussão sobre a noção de desinformação socioambiental e a problematização da participação cidadã.	Alberto Calil Elias Junior (EB UNIRIO/PPGB UNIRIO)	Socio-environmental misinformation. Information education. Public libraries. Community libraries.
		Marielle Barros de Moraes (GCI UFF/PPGCI-UFF).	Information literacy. Reference services. Librarian education. Curriculum.

Source: The authors.

In the formulation of the project, it is acknowledged that contemplating a solidarity-based practice necessitates the recognition of the specificities inherent in the context and community. According to Bell Hooks (2017), education should not be conceived within a universal model. Likewise, an expectation did not exist for the undertaking of a knowledge transfer perspective, denoted by Paulo Freire (1997) as banking education.

Consequently, the starting point involved an examination of the community's informational practices and the sensitization of the Fiocruz library team to the systematization of thematic meetings (September to December) and various project evaluation methods.

The activities encompass an array of expositional, interactive, and dialogical elements, grounded in the understanding that knowledge construction is fundamentally a social process, inherently shaped by socio-historical determinants. Thus, the project endeavors to incorporate, at all stages, the recognition that both mediators and students are traversed by contemporary issues of our time.

In this perspective, it is understood that the student's involvement will contribute to the achievement of project objectives by actively participating in all stages. The student is expected to engage in tasks such as conducting searches in databases and other information sources to support the development of content for the thematic topics of each meeting. Additionally, their participation includes attending in-person meetings, assisting the instructor/librarian in lesson development, and contributing

to the formulation of questions as well as the consolidation of responses for the evaluation questionnaire to be administered to course participants.

This project is closely aligned with academic training in Library Science, as it provides students with the practical experience corresponding to the theoretical knowledge acquired in mandatory courses such as “Serviço de Referência,” “Recursos Informacionais I,” “Recursos Informacionais II,” and “Competência em Informação” at CBG/UFRJ. Similarly, it aligns with the course “Fontes de Informação Gerais” at EB/UNIRIO. It is noteworthy that, through the established connections within the project between teaching, research, and extension, potential pathways for integrating extension activities into the curriculum can be identified, as has been discussed in Brazilian universities (Gadotti, 2017).

The significance in the professional development of librarians is evident through the opportunity for students to engage in all stages of project development, coupled with the experience of working directly with a specific community.

From a civic education perspective, the importance lies in the recognition that the work transcends the mere transfer of knowledge, emphasizing the exchange and construction of knowledge through active participation.

All individuals are involved in every stage of the process and project, thus avoiding segmentation of responsibilities and actions, as collaboration and shared responsibility lead to a collective effort. There is a synergy derived from the collaboration and co-responsibility among all participants.

The conclusion of the project anticipates an evaluation involving the community, student participants, extension scholars, volunteers, and collaborating individuals/institutions. This comprehensive assessment aims to gauge the project’s impact and effectiveness across various stakeholders and contributors.

CONCLUSION

This project is currently ongoing in 2024, but its origins trace back to 2015 when faculty and students from two Library Science schools in Rio de Janeiro initiated information literacy projects within their communities. On one hand, at CBG/UFRJ, professors Nysia Oliveira de Sá and Marianna Zattar undertook an information literacy project with a high school integrated in Environmental Studies, in collaboration with the library of Colégio Pedro II, São Cristóvão unit. Simultaneously, at EB/UNIRIO, Professor Daniela Spudeit and Professor Alberto Calil Elias Junior implemented an information literacy project with a middle school class, also in partnership with the school library at the Humaitá unit of Colégio Pedro II. Although these projects were initially developed independently, it can be asserted that both were part of an interconnected exchange and dialogue around the theme, occurring both internally among faculty and students from both universities and externally, culminating in the realization of the first edition of the Information Literacy Forum of the State of Rio de Janeiro and the formation of the Information Literacy Network of the State of Rio de Janeiro.

It is evident that despite a trajectory spanning almost ten years, the opportunity to encounter new contextual and communicative specificities within the informational domain influences and is influenced by the proposals formulated as dialogues are practiced in interactions. In this perspective, while substantial transformations occurred in contemporary communication infrastructures with the emergence of digital social media platforms and consequently in the info-communicational practices of individuals, the extension actions outlined here engaged in close dialogues with the context, seeking to address the harmful effects caused by misinformation and its ramifications such as hate speech, fake news, among others. These actions were and continue to be grounded in the articulation between teaching, research, and extension in the field of Library Science education, considering varied contexts and diverse perspectives, drawing from experiences with groups of students, faculty, librarians from different institutions and organizations at municipal, state, and national levels.

If, starting from 2015, practices of resistance to misinformation through the lens of information literacy became central to the extension actions of the described project, the effects of the COVID-19 pandemic opened new dialogical perspectives and introduced other “issues” to the public agenda. On one hand, there is a need to consider information literacy practices based on the connections between the fields of information, education, and communication, stemming from information education. On the other hand, the urgency of actions aimed at addressing climate collapse is undeniable and cannot be overlooked. Thus, these issues are incorporated into the formulations and debates present in the extension actions.

In 2024, the year of production of these reflections, Rio Grande do Sul - a state located in the southern region of Brazil - was strongly hit by an extreme weather event. After heavy rains, about 90% of the municipalities in the state suffered the effects of the rain, accounting for more than 2 million people affected and the destruction of the infrastructure of many municipalities. 2024 is also shaping up to be a year marked by world temperature records on all continents. However, despite these extreme events that spread across the planet with greater frequency and intensity, socio-environmental and climate disinformation has been systematically disseminated through different information ecosystems. Thus, actions aimed at information education such as those developed in this project, particularly with school-age communities, are urgent and necessary to face the multiple contemporary crises.

The next steps anticipate the completion of this presented project and the initiation of its continuation through the adaptation of other proposals with different individuals and communities. It is acknowledged that the primary challenge of practices like these lies in the creation, use, and dissemination of misinformation, as well as the systematization of digital social networks as the main source of information for individuals.

In conclusion, the growing need for actions of this nature is evident so as to contribute to the confrontation of false and/or decontextualized narratives, both in the field of sustainable development and in maintaining the democratic principles of the country.

REFERENCES

Angelo, M. (2023, Dezembro 1). Enquanto Maceió continua a afundar, Braskem divulga seus feitos sustentáveis na COP28. Observatório da Mineração. <https://observatoriodamineracao.com.br/enquanto-maceio-continua-a-afundar-braskem-divulga-seus-feitos-sustentaveis-na-cop-28/>

Brasil. (1968, novembro 29). Lei nº 5.540, de 28 de novembro de 1968: Fixa normas de organização e funcionamento do ensino superior e sua articulação com a escola média, e dá outras providências. Diário Oficial da União. <https://www2.camara.leg.br/legin/fed/lei/1960-1969/lei-5540-28-novembro-1968-359201-publicacaooriginal-1-pl.html>

Brasil. (1988). Constituição da República Federativa do Brasil. Senado Federal. https://www.planalto.gov.br/ccivil_03/constituicao/constituicao.htm

Brasil. (1996, dezembro 20). Lei nº 9.394, de 20 de dezembro de 1996: Estabelece as diretrizes e bases da educação nacional. Diário Oficial da União. https://www.planalto.gov.br/ccivil_03/leis/l9394.htm

Calil Junior, A., Sá, N. O. de, & Zattar, M. (2021, agosto). A extensão universitária e o exercício da práxis no campo informacional: Práticas para apropriação da informação e do saber. *The International Review of Information Ethics*, 30(1), 1-9. <https://doi.org/10.29173/irie399>

Chauí, M. (2003, Setembro-Dezembro). A Universidade Pública sob nova perspectiva. *Revista Brasileira de Educação*, (24), 5-15. <https://www.scielo.br/j/rbedu/a/n5nc4mHY9N9vQpn4tM5hXzj/?format=pdf&lang=pt>

Escola Politécnica de Saúde Joaquim Venâncio. (n.d.). *Programa de vocação científica*. <https://www.epsjv.fiocruz.br/programa-de-vocacao-cientifica-provoc>

Fernandes, S. (2023). *Soberania e a policrise*. Alameda Institute. <https://alameda-institute.dossier-i/soberania-e-a-policrise/>

Freire, P. (1997). *Pedagogia da autonomia: Saberes necessários à prática educativa*. Paz e Terra.

Gadotti, M. (2017). *Extensão universitária: Para que?* Instituto Paulo Freire. https://www.paulofreire.org/images/pdfs/Extens%C3%A3o_Universit%C3%A3ria_-_Moacir_Gadotti_fevereiro_2017.pdf

Geraldo, G., Pinto, M. D. de S. (2021). Os Anais do XXVII CBBB e sua aderência às diretrizes da IFLA aos objetivos do Desenvolvimento Sustentável da ONU. *Revista Brasileira de Biblioteconomia e Documentação*, 17, 1-27. <https://rbbd.febab.org.br/rbbd/article/view/1470>

Hooks, B. (2017). *Ensinando pensamento crítico: Sabedoria prática*. Elefante.

Paula, J. A. de (2013). A extensão universitária: História, conceito e propostas. *Interfaces: Revista de Extensão*, 1(1), 5-23. <https://periodicos.ufmg.br/index.php/revistainterfaces/article/view/18930/15904>

Santos, B. de S. (2010) *A universidade no século XXI: Para uma reforma democrática e emancipatório da universidade*. Cortez.

Vidal, I. (2023, dezembro 2). Enquanto Maceió afunda, Braskem patrocina eventos “sustentáveis”. *Revista Fórum*. <https://revistaforum.com.br/brasil/nordeste/2023/12/2/enquanto-maceio-afunda-braskem-pratrocina-eventos-sustentaveis-148771.html>

Zattar, M., Calil Junior, A. & Sá, N. O. de. (2022). Ação biblioteconômica: Relação entre competência em informação e prática informacional. In: A. C. Bezerra, M. Schneider (Ed.), *Competência crítica em informação: Teoria, consciência e práxis*. (pp.161-173). IBICT.

Exploring the Information Sources of the Indigenous People of Terena (Brazil) considering the United Nations (UN) 2030 Agenda for the Safeguarding of Cultural Heritage

*Lilian Aguilar Teixeira*¹

*Ana Lúcia Terra*²

*Oswaldo Francisco De Almeida Junior*³

*Antonio Hilario Aguilera Urquiza*⁴

ABSTRACT: This study investigates the sources of information of the indigenous Terena people of Bananal village, Brazil, exploring whether these sources are respecting the multiculturalism of the community in the face of attempts at acculturation and the challenges imposed by modernization. Using a qualitative and ethnographic methodology, with field research carried out between 2021 and 2022 with interviews with 18 participants (students, teachers, elder and chief), which were complemented by direct and indirect

¹ University of Coimbra, Coimbra, Portugal.
Universidade Estadual Paulista Júlio de Mesquita Filho, Marília, Brazil.
E-mail lilian.teixeira@unesp.br | ORCID iD: <https://orcid.org/0000-0003-4238-0833>

² University of Coimbra Coimbra, Portugal.
E-mail anaterra@fl.uc.pt | ORCID iD: <https://orcid.org/0000-0003-1292-2849>

³ Universidade Estadual Paulista Júlio de Mesquita Filho, Marília, Brazil.
E-mail ofaj@ofaj.com.br | ORCID iD: <https://orcid.org/0000-0003-3629-7435>

⁴ Federal University of Mato Grosso do Sul, Campo Grande, Brazil.
E-mail hilarioaguilera@gmail.com | ORCID iD: <https://orcid.org/0000-0002-3375-8630>
<https://doi.org/10.36311/2025.978-65-5954-624-4.p333-357>

observations, the work investigates the modalities of access to information (informal and formal channels) and examines the diversity of information sources (oral, written, visual), including internet access. The results show the complexity of the Terena's information behavior, highlighting the importance of adapting information practices to their specific cultural needs. The research underlines the relevance of legal policies and international treaties in preserving cultural diversity and the right to access information, in line with the UN Sustainable Development Goals. This study contributes to the understanding of information behavior in multicultural contexts, highlighting the need for approaches that analyze the context of the indigenous population.

KEYWORDS: Indigenous peoples, Information behavior, Information sources, Multiculturalism.

INTRODUCTION

Over the decades, the field of Information Behavior has undergone a remarkable transformation, initially migrating from a rigidly technological approach to a paradigm more centered on the user's perspective. This transition was marked by the pioneering studies of Wilson (1981), Ellis (1989) and Kuhlthau (1991), which, in their initial phase, focused predominantly on the academic and professional domains.

The significant turning point in Information Science began with the innovative vision of Savolainen (1995), who recognized the search for information as an intrinsic activity in everyone's daily life. This perception provoked a paradigmatic shift in Information Science, orienting it towards a more social approach. By adopting this perspective, it became evident that the practices of searching for, locating and identifying information vary considerably between different communities, each influenced by its specific context. This broader and more inclusive understanding introduced a new dimension to the field, highlighting the importance of considering cultural and social nuances in the analysis of information behavior.

In order to broaden the focus of studies for socially excluded populations, this study set out to investigate the informational context of Brazil's indigenous peoples, specifically the Terena ethnic group from Bananal village. The justification for this investigation lies in the profound transformation in their way of life, resulting from attempts at acculturation, which inevitably shape the informational behavior of these groups.

Faced with this scenario, initiatives have been implemented to mitigate the impacts on the multicultural preservation of indigenous peoples. Laws and treaties have been established to incorporate the indigenous population into the parameters of preserving their cultural diversity and the universal right to access information, as evidenced by the Federal Constitution (Brazil [Constitution (1988)]) and international treaties (Organização das Nações Unidas, 2007; United Nations, 2015). It is worth noting that indigenous peoples are included in the Sustainable Development Goals (United Nations, 2015), with special emphasis on the protection and preservation of the cultural and natural heritage of their communities. This inclusion is crucial as a guiding compass, essential to help combat existing disparities.

Based on studies conducted by various researchers who have explored different contexts and countries, such as Chakrabarti (2001), Lilley (2010) and Valdez Angeles (2010), the central objective of this research is to analyze whether the sources of information used by the indigenous Terena of Bananal village are truly respectful of their multiculturalism.

To achieve this, we outlined specific objectives aimed at identifying the ways in which the population obtains information, whether through informal or formal channels. In addition, we sought to analyze the various sources of information available, covering oral, written and visual aspects, and to check whether the population has access to the internet, considering the technological implications for their information behavior.

The research was conducted between 2021 and 2022 in the Bananal village, using a qualitative approach with an ethnographic bias. The study comprised in-depth interviews with 18 participants, which were complemented by direct and indirect observations, providing a comprehensive and contextualized understanding of access to multicultural information, the channels for acquiring information, the different sources used and access to technological resources by the Terena community.

In light of this question, it becomes imperative to explore the literature that addresses information behavior in different contexts, in order to better understand how indigenous communities, particularly

the Terena, engage with information sources. This detailed examination underpins our investigation, situating it within a broader dialog about multiculturalism, access to information and cultural preservation.

LITERATURE REVIEW

BRIEF INTRODUCTION OF INFORMATION SOURCES

During the review of the literature for the development of this work, we found a frequent use of terms such as “informational behavior” (Wilson, 1981) “information-seeking behavior” (Krikelas, 1983) and “information search process” (Kuhlthau, 1991) resulting in a diversity of names and meanings (Hernández Salazar et al., 2007). Given this terminological complexity, it is crucial to highlight the concept proposed by Wilson (1999), who argues that information-seeking behavior constitutes a subset of the broader field of information behavior. This subset is particularly concerned with a variety of methods that people employ to discover and gain access to information resources.

In the analysis of information behavior, Wilson (2000) highlights the complexity inherent in this phenomenon, which manifests itself through various activities, such as searching for, using and sharing information. In particular, with regard to information-seeking behavior, Wilson (1999) discusses how it develops as a result of a need perceived by the information user. To satisfy this need, the user makes demands on information sources or services, both formal and informal. This intricate process reveals the dynamic interconnection between individual information needs and the strategies adopted to meet them, highlighting the complexity inherent in the panorama of information behavior.

Starting our analysis based on the conceptual framework outlined by Wilson (1999), we turn our attention to the principles that guide information sources, since the full functioning of these channels is essential to meet the user's information needs. In the context of concepts related to information sources, several authors have made enlightening contributions. Castillo (2002), for example, defines information sources

as materials or products, whether original or elaborate, which not only provide information or testimonies, but also act as essential vehicles for access to knowledge. This definition is refined to cover any element that provides news, information or data, and which ultimately has the capacity to transmit knowledge, and is therefore considered a source of information.

The breadth of this understanding is further enriched by the reflections of Arruda and Chagas (2002, p.99) who expand the scope by stating that “information sources encompass all types of media and supports that contain information that can be communicated.” These broad considerations consolidate a comprehensive view of information sources, transcending the distinction between tangible materials and digital or institutional resources. This broad focus provides a solid basis for exploring the intricate dynamics of information behavior, highlighting the interconnection between individual information needs and the diversity of sources available to satisfy them.

This implicitly suggests the existence of different modes of information behavior, transcending the mere search for information. Traditional models of information-seeking behavior were devised before the proliferation of the Internet. Studies conducted by Wilson (1999) and Savolainen (1995) offered pioneering analyses, highlighting that Dervin (1976) was a forerunner in directing information-seeking studies to the context of everyday life, recognizing that such practices are deeply influenced by individual values and interests, reflecting people’s way of life.

The innovative perspective introduced by Dervin sees information as an intrinsic element of everyday practices, which are influenced by a complex set of personal, social and cultural factors. In an evolution of his thinking Dervin (1999) adopted a critical stance towards the categorization of “behaviour”, preferring the broader concept of “practice”.

Krikelas (1983), in his model of information-seeking behavior, highlights the category of need as an intermediary factor that triggers the search for and sharing of information. On the other hand, research by Bates (1989) recognizes information search as a less planned and more

organic process, arguing that people can collect information at one point and then move in another direction based on what they have found.

Ellis (1989) analyzes the cognitive components of information-seeking behavior in formal and systematic contexts. His focus is on the behavior of academics, highlighting the cognitive aspects of this search in structured environments.

Savolainen (1995) introduced a model of information-seeking behavior specifically linked to “everyday life”, based on the concept of “life domain”. This concept is broader and more diffuse than solving specific problems or filling knowledge gaps.

Kuhlthau (2004) designed an information search process model that differs from the model proposed by Ellis by organizing the activities into defined stages. In addition, he identified common actions to be carried out at each stage of the information search process, ranging from obtaining basic, relevant and specific information.

The contributions of these authors to the development of models of information behavior are remarkable. However, it is crucial to emphasize that Wilson’s models (1981, 1997, 1999) played a pioneering role in introducing a new perspective to information behavior research, moving towards more person-centered studies. Over the years, the general models of information behavior proposed by Wilson have expanded significantly. It is worth noting that although many of these models are based on behavioral research, they have limitations when describing the search for information in everyday life. Often, these models focus predominantly on academic or professional contexts, neglecting practices that are less oriented towards everyday life (McKenzie, 2003).

As researchers began to employ Wilson’s models as a basis for analyzing the information behavior of users from diverse groups in different parts of the world, it was observed that it is the context of information needs that plays a central role in shaping users’ overall information behavior (Potnis, 2015).

Information seeking is a process that often escapes linearity and rationality and is profoundly shaped by the context in which the user is immersed. Various factors influence this process, including the psychological makeup of the individual, the nature of their goals and the attitudes and perceptions that prevail in the environment in which the information search takes place (Ford, 2015).

THE UNITED NATIONS (UN) 2030 AGENDA FOR THE SAFEGUARDING OF CULTURAL HERITAGE

The preponderance of information behavior analysis in academic or professional contexts highlights the importance of extending research to less explored communities, such as indigenous peoples. It is important to note that these communities are included in the Sustainable Development Goals (United Nations, 2015) with special emphasis on protecting and preserving the cultural and natural heritage of their peoples. This approach reflects the need to overcome the difficulties of multicultural access to information for these communities.

In the context of Latin America, especially Brazil, the multicultural issue takes on a unique configuration. This continent is intertwined in complexity, where interethnic relations carry with them a history marked by painful and tragic episodes, such as European colonization, the negative impact of Afro-descendant slavery and the challenges faced by indigenous peoples in the face of territorial expansion. These events have left deep scars on the cultural preservation of these groups (Moreira & Candau, 2008).

To foster harmonious coexistence in the face of cultural diversity, laws have been enacted to achieve a social balance. The United Nations Declaration on the Rights of Indigenous Peoples (Organização das Nações Unidas, 2007) reaffirms the need to ensure that indigenous peoples enjoy their rights without discrimination. This includes recognizing the right of indigenous families and communities to access education, taking into account the variations in the situations of these peoples in different regions and countries, as well as their diverse histories and origins.

In this challenging scenario, the Sustainable Development Goals (SDGs) are proving to be an essential compass for helping to combat the profound disparities rooted in colonialism and the resistance to recognizing and respecting the rights of indigenous peoples. The 2030 Agenda for Sustainable Development, adopted by the UN as a universal action plan, outlines comprehensive goals and targets in the environmental, economic and social dimensions. This agenda seeks to promote the engagement of countries in the responsibility for developing and implementing strategies aligned with their specific circumstances. It encourages the incorporation of these strategies into government policies, programs and plans, with monitoring and reporting on progress made (Organização das Nações Unidas, 2016).

Within the 2030 Agenda (Organização das Nações Unidas, 2016), certain guidelines deal specifically with indigenous peoples, focusing on issues of access to and preservation of information. For example:

- 1.4. By 2030, ensure that all men and women, particularly the poor and vulnerable, have equal rights to economic resources, as well as access to basic services, ownership and control over land and other forms of property, inheritance, natural resources, appropriate new technologies and financial services, including microfinance.
- 4.5. By 2030, eliminate gender disparities in education and ensure equal access to all levels of education and vocational training for the most vulnerable, including people with disabilities, indigenous peoples and children in vulnerable situations.
- 9.c. Significantly increase access to information and communication technologies and strive to provide universal and affordable access to the Internet in the least developed countries by 2020
- 16.10 Ensure public access to information and protect fundamental freedoms, in accordance with national legislation and international agreements.

Based on these UN Agenda 2030 guidelines, which focus on indigenous peoples, this research analyzed whether they are being met in the context of the Terena ethnic group in Bananal village. The investigation into access to and preservation of multicultural information within the context of the UN's 2030 Agenda not only highlights the importance of global initiatives to protect cultural heritage, but also reflects on how these guidelines directly influence the information practices and cultural preservation of indigenous peoples.

RESEARCH METHODS AND OBJECTIVES

The choice of a qualitative and ethnographic approach is directly influenced by the need to capture the complexities of the information behavior of the Terena of the Bananal village, located in Aquidauana, Mato Grosso do Sul, in the Midwest region of Brazil, which is home to approximately 2,000 individuals. Recognizing the impossibility of covering the whole of this population in our investigation, we opted for a careful sample representing 10% of the inhabitants. This sample was made up of a diverse group of 18 participants, including 11 high school students⁵ from the local school, 5 teachers, a respected elder and the community leader. To collect data, an interview script was drawn up to investigate the modalities of access to information (informal and formal channels) and the diversity of information sources (oral, written, visual), including internet access. This research tool was developed to identify everyday information practices and cultural attitudes within the community, with the aim of contributing both to academic understanding and to strengthening cultural preservation strategies.

FINDINGS

The findings of this study shed light on the complex nature of the informational behavior of the Terena people, highlighting how tradition and modernity are pivotally intertwined. The influence of

⁵ High school in Brazil lasts 3 years, with students aged 15 to 17, which is equivalent to the level of education in the United States of America between 10th, 11th and 12th grade.

the process of acculturation on the Terena, a topic widely debated by linguists, anthropologists and cultural preservation specialists, is crucial to understanding the changes in informational practices within their villages. However, it became imperative to briefly address this aspect in this study, since this phenomenon has had a **significant impact on the context of information sources within the villages**. This is due to the fact that linguistic changes profoundly affected the way culture was transmitted, especially at a time when technological resources had not yet reached the borders of the village. The main form of cultural transmission took place through narratives transmitted verbally in conversation circles, as interviewee P3 pointed out:

when we were children, even in my time, when I was a child, at night there was no TV, so when we started messing around, then grandpa would call, let's sit down, let's talk, then he'd make a fire, it was very common, he'd make a fire, then he'd tell stories, sometimes that they'd heard from people, great-great-grandparents, great-grandparents, these things, you know? That's why they end up dying too, right? A lot of medicines that we used to know, now we can't find them anymore, a lot of things have to be catalogued, you know, they have to be exhibited, they have to be there for people to read about these places, right?

In P3's account, it was clear that there had been a transformation over time in the process of transmitting information in Bananal village. This change not only influenced the way information was shared, but also redefined the channels available for this purpose. There is an awareness of the imminent risk of losing a large part of the elders' knowledge when they pass away, and that this wisdom may not be passed on to younger people. This danger is highlighted by Mori (2020) who points out that when an elder leaves, we lose an authentic living library of traditional knowledge, which encompasses not only their language, but also their customs, dances and music.

In contrast to the worrying situation in Bananal village, where the transmission of knowledge by the elders seems to be dissipating, the research conducted by Chakrabarti (2001) with the Totos ethnic group in

Australia, revealed that this community still values and obtains information from their elders, the head of the community, the priest or religious leader. In addition, research by Dlamini (2016) in the province of KwaZulu-Natal, South Africa, highlights the remarkable respect that young people have for their elders, as well as the teachings they have obtained from them, in addition to the preservation of the custom of grandparents telling stories after dinner.

The interviewees' accounts highlighted a limited perception of the use of interpersonal oral sources as a means of information, despite the participatory power structure observed in the Bananal village inhabited by the indigenous people. As P18 emphasized, the administration of the village is similar to the management of a city, with everyone participating in decisions. In this analogy, the cacique plays the role of mayor, the vice cacique acts as deputy mayor, the president of the council represents the mayor, and the councillors take on similar roles to the members of the city council. The cacique's leadership is crucial for coordinating the population and plays an essential role in transmitting the oral source of information in the village.

The meetings or assemblies held in Bananal village, led by the chief, are predominantly held at the Events Center (figure 1), and are crucial to fostering community unity through collective decisions. These meetings improve joint decision-making and intensify communication between members, serving as channels for exchanging information. The preparation of handwritten minutes by the cacique's secretary, a voluntary task given the unpaid nature of administrative duties, is crucial to recording these events, although there may be delays in documentation. The preservation of a historical archive, as highlighted by interviewees P17 and P18, underlines the importance of keeping the memory of decisions and the community legacy alive for future generations.

“These minutes that I have with me are from the homoheu⁶ here, understand? So much so that Homoheu tore it up, tore up several sheets. I think it was during the other periods.” (P17)

⁶ To protect the real name, the expression homoheu was used, which in Terena means boy (Silva, 2013).

“So we haven’t recorded the meetings... For example, I haven’t put it on paper yet, because I’m running back and forth.” (P17)

“...all the chiefs who passed always had record books, but we didn’t take care to keep them in some place, right? that’s also why today we’re feeling the need to record and talk about the history of our community.” (P18)

Figure 1: Bananal Village Events Center



Source: Photograped by Lilian Aguilar Teixeira (2021).

The accounts provided by the interviewees highlighted gaps and misplacements in the information records of the Bananal village leadership, including labor difficulties in updating the minutes of current meetings. This problem directly compromises the historical integrity of the entity’s governance. Similarly, the research by Amaral (2018) exposes an analogous situation in the Karipuna ethnic group, showing that the absence of the original document relating to the remarking of land in the Juminá indigenous territory could have an impact on the guarantee of territorial rights. These circumstances highlight the current concern of leaders from different ethnic groups regarding the use of written sources

as a fundamental means of safeguarding decisions and discussions in their respective villages.

In addition to the meetings held with the Bananal village leadership, the Terena community also actively participates in the Terena People's Assembly. In its 16th edition, held in 2023, this assembly brought together Terena leaders, chiefs, teachers, youth and women, and is responsible for drawing up the Terena Council's agenda of actions and action plan. In addition, the Terena Youth Assembly, in its 6th edition in the same year, was attended by approximately 200 young people from more than seven villages in the state of Mato Grosso do Sul. At this event, the young people mobilized to discuss issues relevant to their communities, culminating in the creation of a charter that expresses the issues identified by the youth.

The **documents generated at** these assemblies play a crucial role, since they are sent to the Federal Public Defender's Office (DPU) and to state and federal agencies. The meticulous preservation of these assembly minutes is therefore of vital importance, using paper as a fundamental support for safeguarding community narratives, as demonstrated in the study conducted by Paiva (2013) in relation to the relevance of the narratives produced by the Potiguara ethnic group, it was found that the narratives not only represent sources of knowledge, but differ from traditional approaches because they are constructed authentically by the indigenous people themselves. This practice contributes substantially to the concept of "place of speech", as investigated by Ribeiro (2017) representing a break with the silence historically imposed on those who have been subalternized. This movement reveals itself as a significant initiative, seeking to challenge and transcend previously established hierarchies.

Community leadership plays a key role as a valuable source of information for the community, often used as an orientation to solve problems, as defined by Byström & Järvelin (1995). This approach, called "problem-oriented", becomes especially evident in critical situations where important decisions need to be made with the active participation of those affected. During one of our interviews, a concrete example of this dynamic emerged when a participant needed a brief interruption to deal with an atypical situation in the village. This situation reinforced the observation

of Savolainen (1995) that the search for information to solve specific problems is intrinsically linked to the values, attitudes and characteristics of the community's way of life. In this specific context, the interruption occurred due to a cultural particularity of indigenous peoples, highlighting the importance of understanding and respecting such nuances when addressing local issues.

Contrary to what was presented in the reports of this research, informal interpersonal sources predominate in some ethnic groups, as highlighted by Chakrabarti (2001), in the case of the Totos, the preference for the oral source of information is evident, considering it to be more reliable and authentic, as well as being a way of ensuring that indigenous knowledge is not dispersed beyond the community. Similarly, the study by Valdez Angeles (2010) with Nahua migrants in Mexico also found that 52% of those interviewed obtained their information orally, turning mainly to friends and family as their main source when doubts arose.

As for the use of an **oral** source of **information**, some of the reports transcribed below indicate that the local radio station in Bananal village⁷ (figure 2) plays a crucial role with its transmission via radio waves and Facebook, facilitating the dissemination of information to those who do not have access to or familiarity with other technological means. Wilbricht (2020) points out that the incorporation of community radio in an indigenous village represents an essential means of indigenous resistance. The reports from this research corroborate this perspective:

“Here in relation to the community, our radio, right? there's the radio here that we listen to and keep up to date with what's going on, right?” (P3)

“...Now with my family, my parents aren't literate, the information comes more from the TV, right? They watch more, they also listen to the radio.” (P2)

⁷ The radio was created by the community itself, which donated the materials for its implementation, and is maintained by dedicated volunteers. The program takes place live every week and is broadcast not only on the radio, but also on the Facebook page, where it is recorded for later listening. Some broadcasts feature the participation of the chief and special guests. Listeners have the opportunity to request their favorite songs and interact through comments on the radio's Facebook page.

In the various indigenous communities, the influence of context is evident in the way radio information transmissions manifest themselves. Wilbricht's (2020) research in an indigenous community in Alaska highlights specific restrictions linked to sacred cultural elements, despite radio being widely used in climate emergencies. In Brazil, Yakera Jokonae radio⁸ has emerged as a crucial medium for indigenous migrants from Venezuela, allowing them to stay informed and share experiences in the search for a new life (Irnaldo & Hugueney, 2020). This diversity of experiences with indigenous radios highlights the importance of understanding the different cultural and social dynamics involved in their use, showing that their effectiveness can vary considerably depending on the specific context in which they are used.

Figure 2: Bananal Village Radio



Source: Photographed by Lilian Aguilar Teixeira (2021).

⁸ This is one of the strategies of the UN Refugee Agency (UNHCR) to strengthen the protection of indigenous Venezuelans in the north of the country. In partnership with the Mana Institute and the Manaus Municipal Secretariat for Women, Social Assistance and Citizenship (SEMASC). Source: <https://brasil.un.org/pt-br/85790-r%C3%A1dio-comunit%C3%A1ria-engaja-refugiados-e-migrantes-ind%C3%ADgenas-em-manaus>

The use of **orality as a source of information** includes gestures, looks and body expressions. Following this conception, in addition to oral transmission through narratives by the elders, indigenous peoples also use dances, songs and ceramics as vehicles of expression and communication. During this research, while observing the field in Bananal village, especially during the event organized by Saberes Indígenas, cultural elements were presented, such as the performance of the Dança do Bate Pau, Dança da Ema or Kohixoti Kipaé (in the native language)⁹, a dance performed by men and the cultural performance known as Siputrena¹⁰, a dance performed by women, as well as the interpretation of a song by an elder in her native language.

These dances are performed on important occasions for the development of the community and when public authorities visit the village, as a way of expressing gratitude for what these authorities contribute to the improvement of the community (Oliveira, 2016). This confirms that the expression of Terena culture goes beyond orality, acting in the search to establish a form of communication with people outside the village, evidenced by rituals, symbolism in body paintings, necklaces and clothing, which have evolved over time to replace resources that preserve the fauna and flora.

The music performed by an elder during the Indigenous Knowledge event reveals itself in the most significant moments of village life and is currently a rare practice carried out by only a few elders. They play a crucial role in festive celebrations and funeral rites, expressing noble sentiments in a special tone that is heard and respected by all. As indicated by Gregor et al. (2023) music and dance represent powerful means of expressing cultural identity. The relevance of the performing arts as a source of information is corroborated by Lilley (2010) whose study of ethnic Māori concluded

⁹ This dance is performed by Terena men or male children and was originally a festive ritual in the villages, celebrating events such as good hunting, wedding ceremonies and abundant harvests. Today, this ritual has acquired new meanings, including the representation of the Terena who took part in the Brazilian War with Paraguay, demonstrating the strategies employed against their enemies (Oliveira, 2016).

¹⁰ This dance is performed exclusively by Terena women and was originally intended to honor the warriors after they returned from battles against the enemy or from hunting, bringing back meat to feed their families. Nowadays, the Siputrena is also performed to celebrate important dates in the community, just like.

that the representativeness of tradition is an effective method of storing knowledge for the benefit of future generations.

These cultural expressions preserved by the Terena ethnic group represent a form of interconnection with their ancestry, although the younger generations have not adopted the habit of learning to sing. These manifestations are an essential part of the process of transmitting information, acting as a disseminator of Terena culture. As well as serving as a means of dissemination for the community itself, they promote a deep sense of belonging, including participants who have collaborated in some way with their community.

The use of cultural expressions as a tool for disseminating Terena culture emerges as a catalyst for inspiring the towns surrounding Bananal village to rethink their dynamics, promoting the inclusion of Terena diversity. The frequent presence of indigenous peoples in urban areas, whether for shopping or university education, offers an opportunity to establish a more meaningful dialog with local inhabitants. The recent adoption of the Terena language on a market sign is a concrete example of this initiative, symbolizing not only a welcoming gesture, but also showing that the active promotion of indigenous culture has contributed to the occurrence of this intercultural exchange, including through a written source of information (Alves, 2023).

As for the **search for information through technology**, from the perspective of indigenous peoples, the transmission of their knowledge goes beyond what technology can offer them. However, there is growing concern about the possible lack of adequate preservation of their ancestral knowledge, contributing to the loss of the cultural identity rooted in their customs and beliefs, which form an intrinsic connection with their essence. This concern is evident in the account shared by interviewee P18, who highlighted how new technological resources have impacted not only oral transmission, but also the sources of information available in the daily life of the village, as mentioned below:

Yeah, I think this system has broken down a lot, you know? because nowadays everything has been innovated, right? everything, at the time there was no such thing as a cell phone, these things, today the internet, I see that young people, young people today are more connected, surfing all the time, forgetting their father, forgetting their mother and if their parents hold them back, don't really push them to talk, to guide them, as a person, right? because the internet isn't going to teach you how to be someone, because there are options out there and young people, you know? young people go for what's good for them at the moment and what's good for them today isn't always good for their lives afterwards, right?

The testimony of P18 also indicated the perception that the young indigenous people of Bananal village show no interest in exchanging cultural information with the elders. At the same time, when analyzing the narrative of this same participant, it was identified that he currently shows no interest in obtaining news from outside his village through other means of information, as expressed: *“Yeah, I’m not currently following television, so much so that I’m not knowing anything, I’m not knowing anything”* and that he also doesn’t have the habit of using other resources: *“I have a cell phone, but it’s only for when I go to the city, right? I call here.”*

The lack of interest in searching for information is addressed by Savolainen (2017) who argues that this lack of desire does not act as a catalyst and is not an initial driving factor for information seeking. In contrast, the research by Souza (2002) who analyzed the culture of the Terena in an urban village in Campo Grande/MS, highlights the significant value placed on oral communication among them, along with the remarkable concern of young people to document information related to legends, stories and important cultural aspects. Some specific initiatives are implemented in indigenous schools to recover stories with the elders, as seen at the book launch event for the Indigenous Knowledge project in Bananal village, where the students presented the project developed as a school activity, which included interviews about the historical accounts of the elders’ wives. Similarly, Rezende (2023) found research carried out by Terena students from the village of Cachoeirinha in Miranda/MS, in

which they obtained information from their elders about teachings related to the sky, culminating in a presentation at a university event.

In oral communication, it is common for both sender and receiver to share a context, but the choice of information channel is intrinsically related to the individual needs of each. According to Cyr et al. (2021) age is not the determining factor in information-seeking behavior. Instead, context, situation, social factors and educational level influence individuals' choices and use of tools and resources, both digital and physical. This is evident even in communities of the same ethnicity located in different cities, as observed in the Terena ethnic group of the Bananal village in Aquidauana and the urban village in Campo Grande. It can be seen that their information needs can vary substantially, which means that they have to use different means to meet these diverse demands. This finding reinforces the uniqueness of each community studied, highlighting distinct profiles that result from their cultural circumstances.

When exploring the role of technology as a source of information, the analysis of the interviewees' accounts in Bananal village reveals that frequent use of the internet is prevalent in the professional and educational context, and is widely recognized as a primary source of information to meet informational needs, as expressed in the following statements:

“At work we use information a lot now through the internet.” (P2)

“On the internet, right? The state's own journalistic website, the state's portal.” (P3)

The interviewees' statements corroborate the study by Du & Haines (2017) conducted in an indigenous community in Australia, which found that the majority of interviewees who use the internet are teachers, using it as a working tool to help plan their lessons. At the same time, a survey carried out in Brazil with indigenous students at UFPB found that the first place they chose to look for information was the internet. These findings corroborate the perspective of Lemos (2021) who points out that indigenous people recognize that technology is not a saving agent,

but consider it extremely important, especially to guarantee their right to access education.

Although the report of 10 interviewees highlights the internet as the main means of searching for information, it is important to note that 8 interviewees do not have access to devices such as a computer, notebook or cell phone. This shows that access to information for all is still a utopia for a large part of the Brazilian population. Some interviewees seek information from other sources, as exemplified by these reports:

“It’s more books, right? because I don’t have access to the internet, right?” (P7)

“It’s easier to find information with my grandmother or my mother, because they know a lot of information, like my grandmother, she (audible)... the older ones.” (P10)

“So that’s it, I like to do research, not only on the internet, computer, these things, but also in books, magazines.” (P2)

One of the difficulties mentioned in the reports is the restriction of internet access at the Bananal village school, which is limited to UFMS staff or university students. This situation confirms the conclusion of the study by Wilson (1997), who points out that the fundamental requirement for searching for information is that the source of information must be accessible, causing a possible inhibition in the search for complementary information due to the high cost of the internet. This reality is similar to the scenario described in the research by Lilley (2010) in which it was found that students’ access to the internet at a school in an indigenous village in New Zealand is restricted due to the strict filtering carried out by the school, blocking access to suspicious websites.

DISCUSSION, CONCLUSION

This study revealed the complexity of the informational behavior of the Terena people, highlighting how traditions intertwine with modernity. It was observed that acculturation has had a profound impact

on the informational practices of the Terena, especially in relation to the transmission of cultural knowledge.

While in some communities of indigenous peoples in Australia and South Africa the transmission of knowledge by elders continues to be a living and respected practice, in the Bananal village there is a worrying decline in this intergenerational transmission of wisdom.

In addition to orality, cultural expressions such as dances, songs and ceramics play a fundamental role in communication and the transmission of information, reinforcing Terena cultural identity. However, the introduction of technology and the internet presents both opportunities and challenges, especially with regard to the preservation of ancestral knowledge and unequal access to technology.

Diversity in information practices is evident, with some community members turning to digital sources, while others rely on oral or written sources. This diversity underlines the need for integrated approaches that value both tradition and modernity, promoting digital inclusion and the preservation of cultural knowledge in an equitable manner.

The recommendations of this study, therefore, seek to guide future policies and strategies that honor both cultural diversity and the goals of global sustainable development and equitable access to information for indigenous communities on a global stage.

It is therefore concluded that this study not only makes a significant contribution to the academic literature on information behavior in multicultural contexts, but also offers practical guidelines for implementing cultural preservation policies that are truly inclusive and sensitive to the needs of indigenous communities.

REFERENCE

Alves, A. (2023, Março 19). Para acolher clientes, supermercado tem placa até em terena. *Campo Grande News*. <https://www.campograndenews.com.br/lado-b/comportamento-23-08-2011-08/para-acolher-clientes-supermercado-tem-placa-ate-em-terena>

Amaral, E. V. (2018). *Atuação das lideranças na aldeia kunaná (terra indígena juminá): Atuasiō dji lidebas-iela la komunite kunana (laté ēdjē iuminā)* [Trabalho de Conclusão de Curso]. Universidade Federal do Amapá, Macapá.

Arruda, S. M., & Chagas, J. (2002). *Glossário de biblioteconomia e ciências afins: Português-inglês*. Cidade Futura.

Bates, M. J. (1989). The design of browsing and berrypicking techniques for the online search interface. *Online Review*, 13(5), 407–424. <https://doi.org/https://doi.org/10.1108/eb024320>

Constituição da República Federativa do Brasil. (1998). Senado Federal.

Byström, K., & Järvelin, K. (1995). Task complexity affects information seeking and use. *Information Processing & Management*, 31(2), 191–213. [https://doi.org/10.1016/0306-4573\(95\)80035-R](https://doi.org/10.1016/0306-4573(95)80035-R)

Castillo, L. (2002). *Tema 5 Fuentes de información*. Introducción a La Información Científica y Técnica. Curso 2002-2002 . <https://www.uv.es/macas/5.pdf>

Chakrabarti, B. (2001). Over the Edge of Information in the Information Age: Informational Behaviour of the Totos: A small marginal tribal community in sub-himalayan north Bengal, India: One individual perspective. *International Information & Library Review*, 33(2–3), 167–180. <https://doi.org/10.1080/10572317.2001.10762547>

Cyr, C., Brannon, B., & Connaway, L. S. (2021). “I still go ask someone I enjoy talking to”: The use of digital and human sources by educational stage and context. *Library & Information Science Research*, 43(1), 101070. <https://doi.org/10.1016/J.LISR.2020.101070>

Dervin, B. (1976). The everyday information needs of the average citizen: a taxonomy for analysis. In M. Kochen, & J. C. Donohue (Ed.), *Information for the community* (pp.19–38). ALA.

Dervin, B. (1999). On studying information seeking methodologically: The implications of connecting metatheory to method. *Information Processing & Management*, 35(6), 727–750. [https://doi.org/10.1016/S0306-4573\(99\)00023-0](https://doi.org/10.1016/S0306-4573(99)00023-0)

Dlamini, P. N. (2016). *The use of information and communication technology tools in managing indigenous knowledge in the province of KwaZulu-Natal, South Africa* [Thesis Doctor of Philosophy in Library and Information Science]. University of Zululand.

Du, J. T., & Haines, J. (2017). Indigenous Australians' information behaviour and Internet use in everyday life: An exploratory study. *Information Research*, 22(1). <https://www.informationr.net/ir/22-1/paper737.html>

Ellis, D. (1989). A behavioural approach to information retrieval system design. *Journal of Documentation*, 45(3), 171–212. <https://doi.org/10.1108/eb026843>

Ford, N. (2015). *Introduction to information behaviour*. Facet Publishing.

Gregor, S., Gunawardena, M., Imran, A., Okai-Ugbaje, S., Jeffery, C. P., & Wilson, R. (2023). Indigenous knowledge-sharing interventions in Australia and the use of information and communication technology: A scoping review. *Australasian Journal of Information Systems*, 27.

Hernández Salazar, P., Ibáñez Marmolejo, M., Yuriko Valdez Angeles, G., & Vilches Malagón, C. (2007). Análisis de modelos de comportamiento en la búsqueda de información. *Ciência da Informação*, 36(1), 136–146.

Irnaldo, F., & Hugueney, V. (2020, Maio 14). *Transmissão do bem: Rádio comunitária engaja refugiados e migrantes indígenas em Manaus*. Agência da ONU para Refugiados. <https://www.acnur.org/portugues/2020/05/14/transmissao-do-bem-radio-comunitaria-engaja-refugiados-e-migrantes-indigenas-em-manaus/>

Krikelas, J. (1983). Information-seeking behavior: Patterns and concepts. *Drexel Library Quarterly*, 19(2), 5–20.

Kuhlthau, C. C. (1991). Inside the search process: Information seeking from the user's perspective. *Journal of the American Society for Information Science*, 42(5), 361–371. <https://asistdl.onlinelibrary.wiley.com/doi/abs/10.1002/%28SICI%291097-4571%28199106%2942%3A5%3C361%3A%3AAID-ASI6%3E3.0.CO%3B2-%23>

Kuhlthau, C. C. (2004). *Seeking meaning: A process approach to library and information services* (2nd ed). Libraries Unlimited.

Lemos, V. (2021, Fevereiro 20). A luta dos universitários indígenas para não desistir das aulas em ensino remoto nas aldeias durante a pandemia. *BBC News Brasil*. <https://www.bbc.com/portuguese/56089308>

Lilley, S. (2010). *The Information seeking behaviours of Māori secondary school students* [Doctor of Philosophy]. Massey University.

McKenzie, P. J. (2003). A model of information practices in accounts of everyday-life information seeking. *Journal of Documentation*, 59(1), 19–40. <https://doi.org/10.1108/00220410310457993>

Moreira, A. F. B., & Candau, V. M. (2008). *Multiculturalismo: Diferenças culturais e práticas pedagógicas* (2nd ed.). Vozes.

Mori, L. (2020, August 29). Morte de anciãos indígenas na pandemia pode fazer línguas inteiras desaparecerem. *BBC News Brasil*. <https://www.bbc.com/portuguese/brasil-53914416>

Oliveira, E. A. (2016). Uma apresentação iconográfica dos rituais religiosos/culturais Terena na Aldeia Buriti, MS. *Tellus*, 16(30). <https://doi.org/10.20435/tellus.v0i30.394>

Organização das Nações Unidas. (2016). *Transformando nosso mundo: A Agenda 2030 para o desenvolvimento sustentável*. http://www.mds.gov.br/webarquivos/publicacao/brasil_amigo_pesso_idosa/Agenda2030.pdf

Organização das Nações Unidas. (2007). *Declaração das Nações Unidas sobre os direitos dos povos indígenas*. https://www.acnur.org/fileadmin/Documentos/portugues/BDL/Declaracao_das_Nacoes_Unidas_sobre_os_Direitos_dos_Povos_Indigenas.pdf

Paiva, E. B. (2013). *Narrativas indígenas: Construindo identidades e constituindo-se em fontes de informação* [Tese de Doutorado]. Universidade Federal da Paraíba.

Potnis, D. (2015). Wilson's Information-Seeking Behavior Models (1981, 1996, 1999). In *Information seeking behavior and technology adoption: Theories and trends* (pp.94–112). Information Science Reference.

Rezende, G. (2023, Outubro 23). O que o céu indígena tem a ensinar?: Jovens contam teoria de anciões na maior feira científica de MS. *Midiamax*. <https://midiamax.uol.com.br/cotidiano/2023/o-que-o-ceu-indigena-tem-a-ensinar-jovens-contam-teoria-de-ancioes-na-maior-feira-cientifica-de-ms/>

Ribeiro, D. (2017). *O que é lugar de fala?* Letramento.

Savolainen, R. (1995). Everyday life information seeking: Approaching information seeking in the context of "Way of Life." *LISR*, 17, 259–294.

Savolainen, R. (2017). Information need as trigger and driver of information seeking: A conceptual analysis. *Aslib Journal of Information Management*, 69(1), 2–21.

Silva, D. (2013). *Estudo lexicográfico da língua terena: Proposta de um dicionário bilíngue terena português* [Tese de Doutorado]. Universidade Estadual Paulista, Faculdade de Ciências e Letras, Araraquara.

Souza, S. B. de. (2002). *Cultura e memória entre os índios Terena: Conflitos, transformações e preservação* [Dissertação de Mestrado]. Universidade de São Paulo, São Paulo. <http://www.teses.usp.br/teses/disponiveis/47/47134/tde-25052003-211625/>

United Nations. (2015). *Transforming our world: The 2030 agenda for sustainable development* united nations United Nations transforming our world: The 2030 agenda for sustainable development. <https://sdgs.un.org/sites/default/files/publications/21252030%20Agenda%20for%20Sustainable%20Development%20web.pdf>

Valdez Angeles, G. Y. (2010). *Necesidades de información de los indígenas migrantes en la ciudad de México* [Maestra en Bibliotecología y Estudios de la Información]. Universidad Nacional Autónoma de México.

Wilbricht, J. (2020). *Niicugnissuun/Tuu'awinpi: Tribal Radio as a Unique Community Medium and a Source of Health Information for Rural Indigenous Communities* [Doctor of Philosophy]. University of Michigan.

Wilson, T. D. (1981). On user studies and information needs. *Journal of Documentation*, 37(1), 3–15. <https://doi.org/10.1108/eb026702>

Wilson, T. D. (1997). Information behaviour: An interdisciplinary perspective. *Information Processing & Management*, 33(4), 551–572. [https://doi.org/10.1016/S0306-4573\(97\)00028-9](https://doi.org/10.1016/S0306-4573(97)00028-9)

Wilson, T. D. (1999). Models in information behaviour research. *Journal of Documentation*, 55(3), 249–270. <https://doi.org/10.1108/EUM0000000007145>

Wilson, T. D. (2000). Human Information Behavior. *Informing Science*, 3(2). <http://inform.nu/Articles/Vol3/v3n2p49-56.pdf>

Information behavior of Czech and Slovak students during the COVID-19 pandemic: A case of information hygiene

*Michaela Dombrovská*¹

ABSTRACT: The Institute of Czech Language and Library Science at the Faculty of Philosophy and Science at the Silesian University in Opava (Czechia), in cooperation with the Department of Library and Information Science at the Faculty of Philosophy at Comenius University in Bratislava (Slovakia), conducted comparative research into the information behavior of university students during a pandemic and lockdowns. This article is a summary of the results of the first and second phases of the research and introduces the third phase, in which the aim is to contextualize the results of the previous research with similar studies based on the desk research method and secondary data analysis. It appears that the results promise the possibility of finding connections between research of different scope and focus (on a similar topic) and opening the way for further research topics. A practical outcome is the introduction of a new course, Information Hygiene, into the curriculum of library science at Silesian University in Opava.

KEY WORDS: information behavior, information literacy, information hygiene, COVID-19, pandemic

INTRODUCTION

The Institute of Czech Language and Library Science at the Faculty of Philosophy and Science at the Silesian University in Opava (Czechia), in

¹ Silesian University in Opava, Czech Republic.

E-mail: michaela.dombrovská@slu.cz | ORCID iD: <https://orcid.org/0000-0001-5422-9087>

<https://doi.org/10.36311/2025.978-65-5954-624-4.p359-369>

cooperation with the Department of Library and Information Science at the Faculty of Philosophy at Comenius University in Bratislava (Slovakia), conducted comparative research into the information behavior of university students during a pandemic and lockdowns. The Czech data collection was made possible within the framework of an internal student grant competition at Silesian University (SGS/2/2021 and SGS/2/2022), in the first phase through online questionnaires with open-ended questions with an emphasis on self-reflection of the respondents and in the second phase through in-depth semi-structured interviews with selected participants of the first phase. The results of both phases were compared (Dombrovská, Rankov, 2021) with the published results of Slovak research (Rankov 2021) in close cooperation. A comparison of the results of the first and second phase [Dombrovská, Valjentová, 2022], with a particular focus on the area of hoaxes and misinformation, shows that the experiences of students from different countries are very similar despite the adjusted method, time gap and different level of coverage of the respondents. It can therefore be assumed that the global experience of the pandemic affected young people from similar backgrounds in very similar ways and the results of this comparative study may inspire others.

In the third phase of the research in 2023, facilitated by the student grant competition at Silesian University in Opava (SGS/4/2023), the data collected underwent comparison with other research efforts, focusing on similar topics. The comparison primarily focused on aligning the findings with those outlined in the National Report on Digital Addictions in the Czech Republic 2022 (The Report, 2022) and 2023 (The Report, 2023), marking the first official report of its kind in the Czech Republic. This comprehensive report delves into people's behaviors within the digital realm and on social networks. Through this comparison, we aimed to gauge whether the observations made by students in the second phase were roughly consistent with the conclusions drawn in the report within the corresponding focus group. The following students (now graduates) of the Silesian University in Opava gradually collaborated on and contributed to the research: Lucie Valjentová, Dominika Schrammová, Alžběta Martinková, Viktorie Vltavská and Tereza Lysoňková.

RESEARCH METHODOLOGY

In the first phase of the Czech research on students' information behavior, we used a questionnaire with open-ended questions, to which respondents could express themselves in their own words in the form of more comprehensive statements. The research probe was carried out through an e-mail invitation and Google Forms questionnaire application in the months of June to July 2021 (the end of the academic year during the period of anti-epidemic measures). 26 out of 69 contacted students participated, which means 38 % (the minimum requirement was 20 students). Of the participants, 4 were male and 22 were female, 21 students of bachelor's and 5 students of master's degree studies at the Faculty of Arts and Science of the Silesian University in Opava. The questionnaire form contained 6 questions in the format of broad topics, which were focused so that the answers could be compared with two research surveys of Slovak students focused on analogous topics.

In the second phase, we proceeded in the form of semi-structured interviews with selected respondents of the first phase of the research, which took place between June and August 2022 (which corresponds to the end of the academic year). Seven interviews were conducted (the minimum requirement was five interviews), involving five women and two men of the Master's (continuing) studies at the Faculty of Philosophy and Science of the Silesian University in Opava. Three of the students took part only in the second phase, due to the turnover of students during the transition between Bachelor and Master studies. We then compared the results of both phases with the published results of Slovak research, with whose author we also worked closely throughout both phases of the research.

While in the second phase we focused on the topic of misinformation and hoaxes, in the third phase we went back to the information behavior itself and searched the previous data for information on how students (based on their self-observations) behaved in digital world, in particular whether they observed an increase in time spent online or expressed concerns about possible emerging digital addiction.

RESEARCH RESULTS

The first phase of the research showed that the short-term change in students' information behavior was a rapid increase in interest in current health and political and social information, coupled with a shift towards traditional mass media (television, online newspapers) during the first wave of the pandemic. However, this interest gradually faded until it returned to pre-pandemic levels. Parallel to the declining interest in up-to-date information, students' disgust with social networks grew, which gradually became an uncontrollable arena for the spread of hoaxes and misinformation. Although the amount of time spent on social media initially grew, a significant number of students realized that they had to limit this time. Students have also realized, through the example of distance online education, that technologically unmediated interpersonal contact has its psycho-hygienic importance as well as its practical benefits. The generally felt problem of concentrating on lectures or seminars in the home environment may also provide this generation with an experience useful in the future when thinking critically about telecommuting and working from home.

In the second phase, when we limited the comparison of the results to the issue of hoaxes and misinformation in view of the extensive collected responses to the semi-structured interviews, it turned out that the students involved are generally cautious about hoaxes and misinformation, which is to some extent also due to their field of study, which focuses on verifying information. They agree that the level of misinformation has increased significantly during the pandemic and, from their own experiences, say that it is often spread by people who crave attention that they cannot get otherwise, and also mention that lack of education may be the cause. As the second phase of the research took place during the ongoing war in Ukraine, respondents also commented on the fact that the people spreading misinformation during the pandemic are often the same people who continue to spread it during the war. Some respondents also mentioned that they prefer not to talk about certain issues with people in their environment and, unfortunately, they are also less involved in the possible refutation of hoaxes and misinformation. They also have

in common that they consider social networks to be the main source of hoaxes and misinformation and therefore try to spend less time on them. These findings are similar to those of the interviews with Slovak students. Students from both countries also agreed that hoaxes and misinformation divide society, make it more difficult to navigate current events and generally increase information disorder.

In the third phase, we revisited the collected data and turned our attention to other research with a similar focus in order to find similarities. In particular, comparisons were made with The Report on Digital Addictions in the Czech Republic 2022 and The Report on Digital Addictions in the Czech Republic 2023.

DIGITAL ADDICTIONS

The Report on Digital Addictions in the Czech Republic 2022 (The Report, 2022) was issued by the Government Council for Coordination of Policy on Addictions at the Governmental Office of the Czech Republic. As it is the first report of its kind in this country, it is already significant in that it introduces the concepts needed to understand the implications of the enormous increase in the availability and use of new technologies in the population, which has recently been exacerbated by the covid pandemic. Officially, digital addiction has not yet been clearly defined (within the classifications of mental disorders) and is usually considered to be primarily the excessive use of time spent searching the Internet, watching social networking sites, playing digital games, watching streaming movies and TV series, or shopping online. The report establishes, on the basis of conclusive and verifiable data, that the problem of excessive use of the internet, social networking and digital technologies affects a large part of the population in general and is the cause of a number of health disorders and negative impacts on the individual and his/her environment. A second report followed a year later confirmed the results of the first report (The Report, 2023).

The report explicitly identifies the overuse of digital technologies as a serious public health problem, although the negative impacts have

not yet been systematically monitored. It can cause, among other things, disruptions in daily rhythms, neglect of personal hygiene, eating and sleeping, various manifestations of fatigue and impaired orientation in time, and in the long term it can lead to a decline in concentration, problems in maintaining attention and concentration, social difficulties caused by impaired personal relationships, and civilisation diseases caused by increased weight, among others. There is a link with anxiety and depression, but also with aggression or suicidal thoughts. However, as this type of addiction is not officially diagnosed, there is no consistent treatment yet.

The report focuses particularly on the use of digital technologies among children and young people and in the adult population. For example, risky use of social networking sites, which the report defines as more than 4 hours a day, affects up to 30% of primary school pupils and up to 50% of secondary school pupils, with figures clearly higher for girls. Risky digital gaming, again more than 4 hours a day, affects up to 25% of primary school pupils and 15% of secondary school pupils, with higher figures for boys. All of these values increase even further at weekends compared to weekdays. Among adults, the use of the internet and mobile phones (and in particular internet-enabled phones) is now quite common, with the most common activities being searching for information (71%), social networking (60%) and shopping (52%). Outside work and study, people spend up to two and a half hours a day online, and half an hour more at the weekend. According to the report, about 6% of people are outright addicts, which includes compulsive behavior, but this rises to an alarming 22% in the 15 to 24 age group. However, those who are not yet at risk are at risk of developing a gradual addiction, not least because we are generally not yet aware of this danger.

In both phases of our research, students observed and described an increase in the amount of time spent online and concerns about possible social media addiction. Although we do not have data to disentangle how much time and how they spent time online, the results are mutually corroborative. For example, the increased time spent on social media is in line with the findings of the report, which also found that values are

increasing. Further research will be conducted in the future to compare the values from that report and the information behavior of students, but it will no longer be linked to the pandemic period as too much time has passed and such research would no longer be relevant. In the research conducted so far, especially in its second phase, there has also been an expressed need for some form of help in learning to cope with the potential risks of the online world. One answer (among others) is the emergence of a new course in the library studies curriculum that returns to the concept of information hygiene and brings it back to the center of attention, this time in relation to digital detox, information minimalism or digital wellbeing, and information/media/digital literacy in general.

INFORMATION HYGIENE

Information hygiene refers to the practices and behaviors that individuals use to maintain a healthy lifestyle in relation to information and for a safe digital environment. Given the vast amount of information available, it is important that the information we use and share is accurate, reliable and secure. The concept of information hygiene is not new. It is thought to have emerged in the late 1990s when Linda Stone described “continuous partial attention” as a state where the human mind is constantly searching for information in an effort not to miss anything (Stone, 2009). In small doses it can lead to greater productivity, but in larger amounts it over-stimulates and exhausts. There are older sources (Janoš, 1978), however, and librarians have addressed this topic in various forms since at least the 1980s, when information literacy, with which information hygiene is closely related, began to receive attention, as well as the terms digital divide or information overflow (Bawden, Robinson, 2017). Around the year 2000, the term media refusal was introduced by Laura Portwood, which she defines as “voluntary nonuse of a media technology or nonconsumption of media content” (Portwood-Stacer, 2013) as well the term liquid society or liquid modernity by Zigmund Bauman (Bauman, 2002). Greater interest in the topic was foreshadowed by the 2010 book *The Information Diet* (Johnson, 2011), after which terms such as digital detox, information minimalism or digital well-being began to appear more

widely. With the recent growth of artificial intelligence, our dependence on the online world is likely to increase.

Moreover, in recent years, especially in the context of the pandemic and later the war conflict in Ukraine, there has been a growing problem of disinformation, hoaxes and conspiracies in society. The World Health Organization (WHO) in its February 2020 Novel Coronavirus Situation Report states that that the COVID-19 epidemic and the response to it “has been accompanied by massive ‘infodemia’, i.e. an excess of sometimes accurate but sometimes misleading information that makes it difficult for people to find trusted sources and reliable guidance when they need it” (Novel Coronavirus, 2020). One of the key aspects of information hygiene is the ability to spot false or incorrect information. That is, being able to verify information and having built a solid foundation of critical thinking. Another important aspect of information hygiene is the protection of personal information and data. This includes, for example, being mindful of what information is shared online, using secure passwords and two-factor authentication, and avoiding suspicious links or information found on the internet. Information hygiene is also linked to the idea of “info-environmentalism”; that is, if our information environment is polluted, we should not abandon it, but instead help clean it up (Caulfield 2017).

Information hygiene is closely related to information literacy and is also a key element of critical thinking and active citizenship. While information literacy means knowing how to handle information, information hygiene also means understanding when and how to take care of oneself in the digital environment, including the necessary rest from it. It also means building healthy information habits as well as healthy life habits (sleep, diet, breathing, movement, etc.) that strengthen overall mental resilience. It is in information hygiene that the difference between knowing and actually doing is of particular importance. Because, for example, we all know that sugar is harmful, yet we still eat it. The overload of the digital world can have similarly damaging effects. Information hygiene also means being a responsible digital citizen and taking steps to protect ourselves and others in the online world. By being aware of the

risks and taking proactive action, we can create a safer and more secure digital environment for all.

CONCLUSION

The research has shown the possibilities of comparing the experiences of students from different countries, which are very similar despite the adjusted method, the time gap and the different level of coverage of the respondents. It can therefore be assumed that the global experience of the pandemic affected young people from similar backgrounds in very similar ways. However, library science students show a great deal of critical thinking and awareness of the dangers of hoaxes and misinformation. In addition, some of them are also thinking about how they (as so-called micro-influencers within their immediate environment) can influence their families and friends and support the prevention of their spread. Despite the fact that the pandemic has affected and changed students and their information behavior, these changes are not of such a nature as to put them at increased risk of being subjected to misinformation and hoaxes.

Digital addiction is becoming an increasingly widespread phenomenon in today's digital era. It is a condition where an individual exhibits an uncontrolled need to spend excessive time connected to digital devices such as smartphones, computers or social media. This addiction can have a negative impact on an individual's physical and mental health, including sleep problems, social isolation, reduced productivity and emotional instability. Digital addiction can be caused by a variety of factors, such as the easy availability of technology, the appeal of online content and interaction, and an escape from reality and personal problems. It is important to be aware of your digital behavior and maintain a healthy balance between the online and offline worlds. Preventing digital addiction involves setting healthy boundaries for digital device use, scheduling time without digital technology, seeking alternative activities, and strengthening social relationships outside of the digital space. Digital literacy education and the development of good digital life management skills are key to preventing and addressing digital addiction. It is important to recognise

that digital technology is a powerful tool that can improve our lives if we use it wisely and with awareness. Spending time offline, taking care of physical and mental health and maintaining a balanced approach to the digital world are key to preventing and managing digital addictions.

One solution (among others) may be to include a course focused on building good information habits in the curriculum of universities. Such a course should be very practical and contribute to the mental or/and overall well-being of students, also because we are facing a noticeable increase in mental health problems in schools in the Czech Republic (ČTK, 2023). In contrast to information literacy, which teaches (in simple terms) how to use information correctly, information hygiene also teaches when to disconnect from information and the online world and how to take care of oneself properly so that good information habits support mental and physical resilience in a digital environment (Dombrovská, 2024). In an increasingly connected world, this is proving to be really important.

REFERENCES

Bauman, Z. (2002). *Tekutá modernita* [Liquid Modernity]. Mladá fronta.

Bawden, D., & Robinson, L. (2017.) *Úvod do informační vědy* [Introduction to Information Science]. Flow.

Caulfield, M. (2017, October 23). Info-Environmentalism: An Introduction. *EDUcause*. <https://er.educause.edu/articles/2017/10/info-environmentalism-an-introduction>

ČTK [Czech News Agency]. (2023) *Až 40 procent devátáku v Česku má podle studie známky střední či těžké deprese* [Up to 40 percent of ninth-graders in the Czech Republic show signs of moderate or severe depression, study finds]. <https://www.novinky.cz/clanek/veda-skoly-az-40-procent-devataku-v-cesku-ma-podle-studie-znamky-stredni-ci-tezke-deprese-40446340> [cit. 2023-10-10].

Dombrovská, M., & Rankov, P. (2021). *Informační chování českých a slovenských studentů v období pandemie COVID-19* [Information behavior of Czech and Slovak students during the COVID-19 pandemic]. *ITLib*, 3–4. <https://itlib.cvtisr.sk/clanky/informacni-chovani-ceskych-a-slovenskych-studentu-v-obdobii-pandemie-covid-19/>

Dombrovská, M., & Valjentová, L. (2022). Information behavior of Czech and Slovak students during the COVID-19 pandemic with a focus on hoaxes and misinformation. *Annales Universitatis Paedagogicae Cracoviensis | Studia ad Bibliothecarum Scientiam Pertinentia*, 20, 373–378. <https://doi.org/10.24917/20811861.20.22>

Dombrovská, M. (2024, March 20). Re:Discovering Information Hygiene. *Personal/ professional blog* [LinkedIn]. <https://www.linkedin.com/pulse/rediscovering-information-hygiene-michaela-dombrovská-huqse/> (or <https://www.linkedin.com/in/infopolis/recent-activity/articles/>)

Janoš, K. (1978). Informační hygiena [Information Hygiene]. *Čs. Informatika*, 20(10), 297–280.

Johnson, C. A. (2011). *The information diet: A case for conscious consumption*. O'Reilly Media.

Novel Coronavirus (2019-nCoV). (2020). *Situation Report – 13*. Organizaçāo Mundial da Saúde. <https://www.who.int/docs/default-source/coronavirus/situation-reports/20200202-sitrep-13-ncov-v3.pdf>

Portwood-Stacer, L. (2013). Media refusal and conspicuous non-consumption: The performative and political dimensions of quitting Facebook. *New Media and Society*, 15(7), 1041–1057. <https://doi.org/10.1177/1461444812465139>

Rankov, P. (2021). Informačné správanie a informačná gramotnosť mladej generácie v čase pandémie COVID-19 [Information behaviour and information literacy of the young generation during the COVID-19 pandemic]. *Knížnica*, 1(22), 12–21.

Stone, L. (2009, November 30). Beyond simple multi-tasking: Continuous partial attention. *Personal/Professional blog*. <https://lindastone.net/2009/11/30/beyond-simple-multi-tasking-continuous-partial-attention/>

The Report on Digital Addiction in the Czech Republic 2023. (2023). *National Monitoring Centre for Drugs and Addictions, Office of the Government Council for the Coordination of Addiction Policy, Office of the Government of Czech Republic*. https://www.drogy-info.cz/data/obj_files/33889/1220/Zprava_o_digitalnich_zavislostech_v_CR_2023.pdf

The Report on Digital Addictions in the Czech Republic 2022. (2022). *National Monitoring Centre for Drugs and Addictions, Office of the Government Council for the Coordination of Addiction Policy, Office of the Government of Czech Republic*. https://www.drogy-info.cz/data/obj_files/33706/1150/Zprava_o_digitalnich_zavislostech_v-CR-2022_v220830.pdf

Part IV

**Libraries and education for
sustainability**

LIS programs and profession: an overview of Croatian and Portuguese students' perceptions and expectations

*Sanjica Faletar*¹

*Ana Lúcia Terra*²

*Borna Petrović*³

*Martina Slobodjanac*⁴

*Beatriz Chaiça*⁵

*Carolina Alves*⁶

ABSTRACT: Library and Information Science (LIS), as a field of study, research, and practice, has experienced significant transformation in recent years, driven by profound cultural,

¹ Department of Information Science, Faculty of Humanities and Social Sciences, University of Osijek, Croatia.
E-mail: sfaletar@ffos.hr | ORCID iD: <https://orcid.org/0000-0001-7387-6458>

² University of Coimbra, CEIS20 – Centre for Interdisciplinary Studies, Portugal.
ORCID iD: <https://orcid.org/0000-0003-1292-2849>

³ MA Student, Information Science and English Language and Literature, Faculty of Humanities and Social Sciences, University of Osijek, Croatia.
E-mail: bpetrovic@ffos.hr | ORCID iD: <https://orcid.org/0009-0003-6655-5279>

⁴ MA Student, Information Science, Faculty of Humanities and Social Sciences, University of Osijek, Croatia.
E-mail: mslobodjanac@ffos.hr | ORCID iD: <https://orcid.org/0009-0006-5972-9623>

⁵ Master student, Information Science, Faculty of Arts and Humanities, University of Coimbra, Portugal.
E-mail: bmchaica@gmail.com | ORCID iD: <https://orcid.org/0000-0003-4529-8130>

⁶ BA student, Information Science, Faculty of Arts and Humanities, University of Coimbra, Portugal.
E-mail: carolinagouveiaalves@gmail.com | ORCID iD: <https://orcid.org/0000-0001-7750-3595>

<https://doi.org/10.36311/2025.978-65-5954-624-4.p373-389>

political, economic, and technological shifts. To understand how these changes affect the LIS profession within a global information environment, as well as LIS programs, this paper examines the perceptions of LIS students from Croatia and Portugal regarding the profession and their academic programs. The comparative study, conducted between June and December 2023, used an online survey with multiple-choice and Likert-scale questions to capture the perceptions of undergraduate students from the universities of Osijek and Coimbra. With a sample of 131 participants, 86 from Croatia and 45 from Portugal, the research reveals that most students are women and most had no prior academic experience. The results show that students agree that the librarian profession requires continuous learning, but it is neither well-paid nor widely recognized by the public. The main motivation for Croatian students to enter the field was an interest in working with technology, while for Portuguese students a love of books was a decisive factor. The study highlights cultural differences in the profession's perception, particularly regarding its female-dominated nature, which is more recognized by Portuguese students. These findings are relevant for developing and adjusting LIS curricula, emphasizing the need for greater public awareness and appreciation of the profession.

KEYWORDS: Library and Information Science (LIS), educational program, profession, students, perception

INTRODUCTION

Library and information science (LIS) as a field of study, research and application has been undergoing a major transformation in recent years due to main cultural, political, economic and technological changes in contemporary society. To understand how these changes impact the LIS profession in a global information environment and LIS programs, a number of international scholars have investigated the students' perceptions of the profession, but also their motivation, competencies and satisfaction with their academic programs (Cherry et al., 2011; Cherry et al., 2013; Moniarou-Papaconstantinou et al., 2015; Fraser-Arnott, 2017, Faletar Tanackovic et al., 2018; Ammarukleart et al., 2021; Chaka, 2020; Saunders & Bajjaly, 2022; Sibiya & Shongwe, 2018; Faletar et al., 2023).

Although international LIS education programs vary significantly and the debate about the scope, structure and focus of LIS programs is still intense, there seems to be a global understanding of core professional knowledge and competencies required by LIS professionals working in a dynamic information environment. In 2022, the International

Federation of Library Associations and Institutions (IFLA) published the *IFLA Guidelines for Professional Library and Information Science (LIS) Education Programmes* to be used as a framework for developing LIS education programs and made up with eight foundational knowledge areas (1. Information in Society, 2. Foundations of the LIS Profession, 3. Information and Communication Technologies, 4. Research and Innovation, 5. Information Resources Management, 6. Management for Information Professionals, 7. Information Needs and User Services, and 8. Literacies and Learning) (Chu et al., 2022). The *ALA's Core Competences of Librarianship* defines the basic knowledge gained through LIS education, job on-boarding, and ongoing professional development in early in a library career (American Library Association (ALA), 2022). The ALA's Core Competences can be used to inform the curriculum and include nine core areas of competences (1. Gateway Knowledge, 2. Information Resources, 3. Lifelong Learning and Continuing Education, 4. Management and Administration, 5. Organization of Recorded Knowledge and Information, 6. Reference and User Services, 7. Research and Evidence-Based Practice, 8. Social Justice, and 9. Technological Knowledge and Skills). From an academic perspective, and grounded on the analysis of competency profiles, Fraser-Arnott (2017) developed five competency groups, which are 1. collaboration, client service, and communication; 2. organizational understanding and strategic alignment; 3. programme and service delivery and management; 4. records, information, and knowledge management technical competencies; 5. and personal qualities.

All these approaches are valuable insights to design, analyse and evaluate LIS curriculums. Nevertheless, any conclusions about success (or failure) and long-term strategic decisions about potential changes in the educational programs should be made only after careful examination of relevant literature and evidence-based data collected from all relevant stakeholders (students, seasoned librarians, and employers).

The aim of this paper is to explore students' perceptions of LIS profession and educational programs, as well as their motivations for enrolling in these academic programs. The paper will present a portion

of the findings obtained in a comparative study conducted among undergraduate LIS students in Croatia and Portugal.

THEORETICAL FRAMEWORK

The LIS study area is constantly changing and altering, always keeping pace with changes in the working backgrounds of professionals (Faletar et al, 2023, p.359). There is a pressing need to prepare future LIS professionals for new social, institutional and technological circumstances to assume new roles, transitioning from an isolationist paradigm to a co-ownership and co-creation one. That is, as stated by Robert Taylor in the late 1970s', our schools are moving from a Ptolemaic information world, with the library at the centre, to a dynamic, Copernican universe with information at its centre and with libraries as one of the many planets revolving around this information core (Marchionini & Moran, 2012). The LIS community, involving both academics and professionals, emphasise the importance of attracting open-minded, innovative, creative, dynamic, flexible, and visionary individuals to the LIS discipline. These individuals will be capable of leading the field in new directions, addressing the challenges of an ever-evolving information landscape, and shaping the future growth and success of the information field (Moniarou-Papaconstantinou et al., 2015). LIS programs, either bachelor's, master's or PhD degrees, must adapt to these rapid changes, recruiting motivated students and responding to the labour market expectations and opportunities. For the Philippine setting, (Lascano, 2021) noted that the most effective way to advertise the LIS program is through career orientation and exploration, which will encourage students to choose LIS as a career. Among the options for promoting the degree, conducting career orientation and exploration is the most effective.

In the European context, LIS education is characterised by a high degree of variance and insulation, as local idiosyncrasies in terms of academic traditions, structural specifics and course profiles arise. Furthermore, Sant-Geronikolou et al. (2019), who undertook a comparison study between Greek and Spanish LIS curricula, summarised some issues regarding the

southern European context, underling the low levels of student satisfaction and decreasing enrolment rates prevail, the profession's identity crisis, the library associations' non-involvement in professional accreditation, and the strong mimetic forces that hinder the influx of new knowledge and therefore innovation. In the South African context, with data from three LIS schools, Sibya & Shongwe (2021) conclude that LIS is often a fallback field of study for students who did not initially plan to pursue it. However, interestingly, after enrolling, they became satisfied with the program and motivated to continue. In 2010, Cherry et al. (2013) collected data from students in information programs at six Canadian schools, and they reported that students rated most aspects of their programs positively. However, few respondents gave the highest ratings, suggesting substantial room for improvement. Earlier, during a period of four years (2003-2007), Cherry et al. (2011) collected data for a longitudinal study among the students enrolled in the Master of Information Studies program at the University of Toronto, and the data showed that students arrived excited about the information profession and hopeful about job prospects. However, as they advanced through the program, many became dissatisfied with the professional aspects. They were looking for courses that better prepared them for their first professional role and opportunities to gain practical experience, which they believed would enhance their employability. In the Iranian context, Khalili (2020) has found that of 133 undergraduate and master's students, from the Azarbaijan Shahid Madani University, more than half did not choose their course based on prior knowledge, but around 70% said they were satisfied or very satisfied with their choice. Nevertheless, surprisingly on the Likert scale the statement "the courses of this domain are boring for me" registers an average of 3.19.

These results ensure that programs need to be improved and then evaluated. Students, as an integral part of the primary stage of their professional careers, play an essential role as a decisive factor in the success of any discipline or higher education institution, and they will provide insightful data to better the LIS curriculum (Faletar et al., 2023). It is necessary to question them to understand their perceptions of many related themes. Among several aspects, it becomes imperative to determine the

influences and motivations behind studying LIS, or any related studies, and understand their perceptions concerning the profession (Sibiya & Shongwe, 2021, p.159). Cherry et al. (2011) reinforce this idea underlying we need a clearer understanding of how students perceive the information professions, how their graduate education influences their views and career paths, how they assess the nature and quality of their education, and how shifts in the size, scope, and focus of these programs impact their student experiences.

Involving undergraduates in the assessment process of the LIS program can be seen as a way to address challenges related to scientific and pedagogical alignment and also to support informed data-driven decisions for future curriculum development (Ammarukleart et al., 2021). This approach may help to better align operations with stakeholder needs, resulting in various strategic and practical benefits. Anticipated positive outcomes include the potential to benefit from collaborative efforts, an improvement in organizational morale, and value generation from intellectual capital assets (Sant-Geronikolou et al., 2019). Moniarou-Papaconstantinou et al. (2015) also emphasize that gathering and analyzing data on LIS students and the programs they attend can guide the planning of LIS schools and aid in developing marketing strategies to attract high-quality students.

Research about the perceptions of LIS students regarding their field of study and their expectations related to their professional careers followed different approaches. Sibiya & Shongwe (2021) identified three main areas in which these studies tended to focus: students' satisfaction and dissatisfaction with LIS; students' awareness of programs and career opportunities; and reasons and motivations to enroll in LIS and choose it as a profession. According to Cherry et al. (2011), existing research mainly focuses on the students' motivations for enrolling in LIS courses, their professional goals and expectations, and their perceptions of the information professions and less on students' perceptions of the programs they are attending. On a systematic literature review about the choice of LIS as an educational path Moniarou-Papaconstantinou et al. (2015)

acknowledged three main themes: the choice of LIS, the choice of LIS specialty and career change to LIS.

METHODOLOGY AND OBJECTIVES

The aim of the study was to explore the undergraduate LIS students' perceptions about library profession as well as their motivation for enrolling in LIS academic programs. The comparative study presented in this paper was conducted among undergraduate students at the Department of Information Science at the University of Osijek in Croatia and University of Coimbra in Portugal, from June to December 2023. The study tried to answer the following research questions:

RQ1: How do respondents perceive LIS profession?

RQ2: What motivated respondents to study LIS?

RQ3: Are there any differences in relation to the findings between Croatian and Portuguese students?

The study was conducted with the help of quantitative methodology, through an anonymous online survey by questionnaire. The questionnaire with multiple choice and Likert-type questions was translated into Croatian and Portuguese. Croatian survey was administered to Croatian respondents and survey in Portuguese to students from Portugal. The request to fill out a self-administered survey was distributed via email to all undergraduate students in Osijek and Coimbra. In the introduction to the survey, the researchers shortly explained to students that they can choose not to participate in the study and that they are free to withdraw at any point. Also, participants were informed about the main purpose of the study and the required time commitment (approximately 7 minutes).

Out of the total number of 150 undergraduate LIS students at University of Osijek, Croatia, 86 filled out a survey (57.3% recall). Out of the total number of 126 LIS students at University of Coimbra, Portugal,

45 filled out a survey (35,7% recall). Quantitative data was analysed with the help of SPSS software package for statistical analysis.

FINDINGS

DEMOGRAPHIC INFORMATION

The first section of the survey collected demographic information and some basic characteristics about the respondents, who were all undergraduate LIS students from the University of Osijek in Croatia and the University of Coimbra in Portugal. A total of 131 respondents took part in the survey: 86 were from Croatia and 45 from Portugal. Most of the respondents were female (N=92, 70.2%) in both Croatia (N=60, 69.8%) and Portugal (N=32, 71.1%). The majority of students from both countries (N=99, 75.6%) did not study any other degree at the university level prior to enrolling in the LIS bachelor study program. A slightly smaller percentage of Portuguese students (66.7%) have not been previously enrolled in any studies, compared to the percentage of Croatian ones (80.2%). Furthermore, the vast majority of respondents (N=110, 84.0%) do not have librarians or some other information professionals in their family, with the percentage of negative responses being nearly the same in Croatia (83.7%) and in Portugal (84.4%). (Table 1)

Table 1: Respondents' characteristics

Gender	ALL N (%) ()	HR N (%)	PT N (%)
Male	38 (29.0)	26 (30.2)	12 (26.7)
Female	92 (70.2)	60 (69.8)	32 (71.1)
Other	1 (0.8)	0 (0)	1 (2.2)
Total	131 (100%)	86	45
Prior studying experience			
Yes	25 (19.1)	17 (19.8)	8 (17.8)
No	99 (75.6)	69 (80.2)	37 (66.7)

Information professionals in family			
Yes	21 (16.0)	14 (16.3)	7 (15.6)
No	110 (84.0)	72 (83.7)	38 (84.4)

PERCEPTION OF THE PROFESSION

In the second part of the survey, students were asked to rate their agreement on a scale from 1 (I totally disagree) to 5 (I totally agree) with seven statements about the IS profession in order to identify their perception of the field. Findings have been presented in Table 2. The respondents from both countries agreed least with the statement that library professionals are paid very well (they have a good salary) (Mean 2.56) and the statement that library profession is dominated by women (Mean 2.66). On the other hand, respondents from both countries agreed most with the statement that the library profession demands continuous learning and professional development (after diploma) (Mean 3.89) and that library profession is not well known in the public (Mean 3.84). Croatian students have shown the highest level of agreement with the statement that the library profession has a very important role in modern society (Mean 3.93) and the least level of agreement with the statement that the library profession is dominated by women (Mean 2.20). In contrast, Portuguese students agreed mostly with the statement that the library profession demands continuous learning and professional development after graduating (Mean 4.18), and they agreed least with the statement that library professionals are paid very well (Mean 2.49). Statistically significant difference ($P=0.000$) was identified in relation to the statement "Library profession is dominated by women." Whereas Portuguese students (Mean 3.56) agree more with that statement than Croatian students (Mean 2.20) that library profession is a female-dominated profession. In addition, statistically significant difference ($P=0.011$) was also found in relation to the statement "Library profession demands continuous learning and professional development". Again, Portuguese students (Mean 4.18) agreed more with that statement, as opposed to their Croatian colleagues (Mean 3.73). Taking into

consideration the facts that notably fewer students altogether recognized librarianship to be a female-dominated field (Mean 2.66), that a high number of students perceive that LIS professional play an important role in modern society (Mean 3.84) and that respondents believe that LIS profession requires continuous professional development, it could be said that the respondents' perception of the library profession is not that of a traditional, female-dominated and static field but a profession that is progressive, diverse and dynamic.

Table 2: Respondents' perception of the library profession

Aspect	Mean (ALL)	Mean (HR)	Mean (PT)
Library profession has a very important role in modern society.	3.84	3.93	3.67
Library profession enjoys high reputation in public.	2.74	2.85	2.53
Library profession is dominated by women.	2.66	2.20	3.56
Library professionals are paid very well.	2.56	2.59	2.49
Library profession demands continuous learning and professional development.	3.89	3.73	4.18
Library profession will have very important role in the future.	3.41	3.33	3.58
Library profession is not well known in the public.	3.84	3.90	3.73

Respondents were then asked to rank (on a scale from 1 – the lowest rank to 5 – the highest rank) several different professions, based on their social status and public reputation. Reflecting the local circumstances, respondents were offered slightly different professions. Croatian respondents had to rank the following five professions: IT professionals, librarians, medical doctors, school teachers, politicians. In addition to these five professions, Portuguese respondents had to rank two extra (engineers, and archivists). For both groups of respondents medical doctors are at the head of the list, followed closely by IT professionals. As one can see from the Table 3, librarians assumed the very last place (Croatian respondents) and second-to-last place (Portuguese respondents).

Table 3: Professions according to their social status

Profession Rank	Croatia	Portugal
1	Medical doctors	Medical doctors
2	IT professionals (software developers etc.)	Engineers
3	Politicians	IT professionals (software developers etc.)
4	School teachers	School teachers
5	Librarians	Politicians
6		Librarians
7		Archivists

MOTIVATION FOR STUDYING LIS

Finally, respondents were prompted to choose from a list of reasons (multiple choice question) why they decided to study LIS. Overall, the most popular reason for enrolment seems to be the respondents' love for computers and new technologies (N=64, 48.9%) and love for books and reading (N=38, 44.2%). All values are presented in the Table 7. The least popular reason for deciding to study LIS overall is public reputation and prestige of the LIS profession in society (N=2, 1.5%), where both Croatian (N=2, 2.3%) and Portuguese (N=0, 0.0%) students agree. The most popular reasons for Croatian students were their love for working with computers and new technologies (N=51, 59.3%) and love for books and reading (N=38, 44.2%). Most Portuguese students decided to study LIS because they love books and reading as well (N=19, 42.2%). Interestingly, the same number of Portuguese respondents also said that they decided to study LIS because of good employment possibilities (N=16, 35.6%) and because they could not enroll into any other study program since they had poor grades (N=16, 35.6%).

Table 7: Reasoning behind the decision to study LIS

Statement	ALL N (%)	HR N (%)	PT N (%)
I love working with people.	21 (21.4)	15 (17.4)	13 (28.9)
I love working with computers and new technologies.	64 (48.9)	51 (59.3)	13 (28.9)
I love books and reading.	57 (43.5)	38 (44.2)	19 (42.2)
Recommendation of a family member or a friend.	39 (29.8)	34 (39.5)	5 (11.1)
Nature of the job (dynamic, diverse tasks).	46 (35.1)	32 (37.2)	14 (31.1)
Pleasant working environment.	51 (38.9)	39 (45.3)	12 (26.7)
Good salary.	16 (12.2)	15 (17.4)	1 (2.2)
Good employment possibilities.	53 (40.5)	37 (43.0)	16 (35.6)
Good working hours.	22 (16.8)	21 (24.4)	1 (2.2)
Importance of information services in modern society.	41 (31.3)	23 (26.7)	18 (40.0)
Public reputation and prestige in society.	2 (1.5)	2 (2.3)	0 (0.0)
I have always wanted to work in the library.	23 (17.6)	24 (16.3)	9 (20.0)
I could not enroll into any other study program.	19 (14.5)	3 (3.5)	16 (35.6)
I heard it was an easy study program.	22 (16.8)	18 (20.9)	4 (8.9)

Statistically significant differences (Table 8) were identified in relation to the following variables: “I love working with computers and new technologies.” (P=0.001), “Recommendation of a family member or a friend.” (P=0.001), “Pleasant working environment.” (P=0.037), Good salary (P=0.012), Good working hours” (P=0.001) and “I could not enroll into any other study program” (P=0.000). Namely, Croatian students study LIS more often than their Portuguese colleagues because they are interested in working with computers and new technologies (59.3%), as well as due to a recommendation of a family member or a friend (39.5%). Croatian students also enroll more often in LIS studies because of a pleasant working environment (45.3%), good salary (17.4%), and good working

hours (24.4%). On the other hand, more Portuguese students who study LIS are not able to enroll in any other study program (35.6%).

Table 8: Statistically significant differences

Statement	HR %	PT %	P
I love working with computers and new technologies	59,3	28,9	0,001
Recommendation of a family member or a friend	39,5	11,1	0,001
Pleasant working environment	45,3	26,7	0,037
Good salary	17,4	2,2	0,012
Good working hours	24,4	2,2	0,001
I could not enroll into any other study program (poor grades etc.)	3,5	35,6	0,000

CONCLUDING DISCUSSION

The demographic data gathered from undergraduate LIS students from the University of Osijek in Croatia and the University of Coimbra in Portugal reveals interesting trends. Among the 131 respondents, a significant majority were female (70.2%), which is consistent across both countries (69.8% in Croatia and 71.1% in Portugal). This gender distribution aligns with broader trends in LIS programs globally, which often see higher female enrollment (Cherry et al., 2011; Faletar Tanackovic et al., 2018; Moniarou-Papaconstantinou et al., 2010). However, when asked about the statement “Library profession is dominated by women”, Portuguese students agreed much more (Mean 3.56) than Croatian students (Mean 2.20). So, although the percentage of female students is very similar in Croatia and Portugal, the latter expresses a stronger perception of this trend. This difference might be influenced by cultural perceptions or differences in the visibility of gender roles within the profession in each country.

Additionally, most students (75.6%) had not pursued another degree prior to their LIS studies, with Croatian students showing a higher percentage (80.2%) compared to their Portuguese counterparts (66.7%). This trend is not shared by some countries where librarianship represents a second or even a third career for a significant number of professional librarians, as it occurs in Hong Kong and Canada (Lo et al., 2017). Interestingly, Woodford (2024) underlined for the Canadian setting that there was a lack of STEM background students enrolling in Master of Library and Information Science programs.

Another noteworthy aspect is the lack of family influence in their career choice, with 84.0% of respondents indicating no familial connection to information professions. This can suggest a genuine interest in LIS, driven by personal motivation rather than familial tradition, or, on the contrary, may suggest that the Information Science course path is an unintended or unripe consequence because LIS studies were not a first choice. As for example, in 2018, Faletar Tanackovic et al. (2018, p.54) conducted a study showing that the “majority of Croatian students, and all Turkish students decided to study LIS last minute i. e. at the end of their secondary education and not long before they had to decide what to study”. Anyway, according to the systematic literature review conducted by Moniarou-Papaconstantinou et al. (2015) the role of parents and relatives appears in some studies, but it does not represent a major influence in the choice of the LIS program. More recently, in the South African context, Sibiya & Shongwe (2021) explained that LIS program was not a first but instead a second or subsequent choice for students, with relatives and friends being a major influence for their choosing after information brochures. On the contrary, in the Philippines, when asked about the best promotional strategies for LIS programs, students ranked in least family, relatives and friends, and also personal contact with librarians (Lascano, 2021).

Regarding the perception of the LIS profession, students from both countries agreed that it demands continuous learning and professional development (Mean 3.89) and that it is not well-known to the public (Mean 3.84), although they think it has a very important role in modern society

(Mean 3.84). This underscores a common recognition of the dynamic and evolving nature of the profession, which requires ongoing education and adaptation to new technologies and methodologies (Marchionini & Moran, 2012). However, the perception that library professionals are not well-compensated (Mean 2.56) seems to reflect a widespread concern about the economic viability of the profession. Faletar Tanackovic et al. (2018) also found less than 10% of the students they surveyed in Croatia and Turkey expected compensation and benefits, such as income, when choosing a LIS education. Moniarou-Papaconstantinou et al. (2010) argued that for Greek students coming from lower sociocultural backgrounds and with restricted educational experiences, these employment prospects were of major concern, in contrast with students from intermediate and higher socio-cultural family backgrounds. Furthermore, according to Lo et al. (2017), students who choose LIS as a second career are aware that this is not a high-paying one, but they value instead improved working conditions in terms of stability with a less competitive path, and a work-life balance.

When ranking various professions based on social status and public reputation, librarians were ranked the lowest by Croatian respondents and second-to-last by Portuguese respondents. These results are in line with the findings from Faletar Tanackovic et al. (2018), and also from the Iranian scenario (Khalili, 2020). Such ranking juxtaposes the high social value placed on medical doctors and IT professionals, indicating a need for greater advocacy and public awareness about the importance of the LIS profession. Addressing these challenges requires concerted efforts to enhance the visibility and perceived value of the profession, possibly through targeted public relations campaigns and advocacy efforts within both academic institutions and professional organizations. By improving the public's understanding of the vital role that LIS professionals play in society, it is possible to attract a more diverse pool of students and ensure the profession's growth and sustainability.

The authors believe that the findings of this study can be relevant not only to participating institutions but also to a wider audience as they may indicate trends in LIS education internationally and can inform initiatives

to better LIS study programs and enhance the social knowledge of LIS-related careers.

REFERENCES

American Library Association. (2022). *ALA's core competences of librarianship*. https://www.ala.org/sites/default/files/educationcareers/content/2022%20ALA%20Core%20Competences%20of%20Librarianship_FINAL.pdf

Ammarukleart, S., Wimolsittichai, N., & Timakum, T. (2021). *The status and challenges of Information and Library Science education at Chiang Mai Rajabhat University since 2010*. Proceedings of the 10th Asia Pacific Library and Information Education and Practice Conference (pp. 324–331). Philippine.

Chaka, C. (2020). Skills, competencies and literacies attributed to 4IR/Industry 4.0: Scoping review. *IFLA Journal*, 46(4), 369–399. <https://doi.org/10.1177/0340035219896376>

Cherry, J. M., Duff, W. M., Singh, N., & Freund, L. (2011). Student perceptions of the information professions and their master's program in information studies. *Library and Information Science Research*, 33(2), 120–131. <https://doi.org/10.1016/j.lisr.2010.09.004>

Cherry, J. M., Freund, L., & Duff, W. M. (2013). Students' perceptions of information programs in Canada. *Journal of Education for Library and Information Science*, 54(3), 174–190. <http://www.diigubc.ca/projects/lfos/In>

Chu, C. M., Raju, J., Cunningham, C., Ji, J., Ortiz-Repiso Jiménez, V., Slavic, A., Talavera-Ibarra, A. M., & Zakaria, S. (2022). *IFLA Guidelines for Professional Library and Information Science (LIS) Education Programmes*. IFLA. <https://repository.ifla.org/handle/123456789/1987>

Faletar, S., Balog, K. P., & Ranogajec, M. G. (2023). Library and Information Science study program through the eyes of students: preliminary findings. *Education for Information*, 39(3), 359–381. <https://doi.org/10.3233/EFI-230035>

Faletar Tanackovic, S., Zilic, J., Kurbanoglu, S., & Unal, Y. (2018). *Student perceptions of LIS programs and profession: Study among undergraduates in Croatia and Turkey*. Proceedings from FEIS International EINFOSE Symposium (pp. 46-61). The Future of Education in Information Science. Pisa, Italy.

Fraser-Arnott, M. (2017). Competencies for information specialists in emerging roles. *Library Management*, 38(1), 65–76. <https://doi.org/10.1108/LM-09-2016-0074>

Khalili, L. (2020). Attitude of Library and Information Science students towards discipline and future of the profession. *Brazilian Journal of Information Science*:

Research trends, 14(4), e020016. <https://doi.org/10.36311/1940-1640.2020.v14n4.10824>

Lascano, E. A. (2021, June 14). Students' knowledge on Library and Information Science (LIS): An option for choosing a career. *Library Philosophy and Practice (e-Journal)*, 5875. <https://digitalcommons.unl.edu/libphilprac/5875/>

Lo, P., Chiu, D. K. W., Dukic, Z., Cho, A., & Liu, J. (2017). Motivations for choosing librarianship as a second career among students at the University of British Columbia and the University of Hong Kong. *Journal of Librarianship and Information Science*, 49(4), 424–437. <https://doi.org/10.1177/0961000616654961>

Marchionini, G., & Moran, B. B. (2012). *Information professionals 2050: Educational possibilities and pathways*. <https://sils.unc.edu/sites/default/files/news/Information-Professionals-2050.pdf>

Moniarou-Papaconstantinou, V., Tsatsaroni, A., Katsis, A., & Koulaidis, V. (2010). LIS as a field of study: Socio-cultural influences on students' decision making. *Aslib Proceedings: New information perspectives*, 62(3), 321–344. <https://doi.org/10.1108/00012531011046934>

Moniarou-Papaconstantinou, V., Vassilakaki, E., & Tsatsaroni, A. (2015). Choice of Library and Information Science in a rapidly changing information landscape: A systematic literature review. *Library Management*, 36(8-9), 584–608. <https://doi.org/10.1108/LM-04-2015-0022>

Sant-Geronikolou, S., Koulouris, A., & Kouis, D. (2019). Greek and spanish undergraduate perspectives on academic librarianship, within and beyond Library Science curricula. *Bilgi Dünyası*, 20(2), 183–215. <https://doi.org/10.15612/BD.2019.751>

Saunders, L., & Bajjaly, S. (2022). The importance of soft skills to LIS education. *Journal of Education for Library and Information Science*, 63(2), 187–215. <https://doi.org/10.3138/jelis-2020-0053>

Sibiya, P. T., & Shongwe, M. M. (2018). A comparison of the cataloguing and classification curriculum and job requirements. *Library Management*, 39(6–7), 474–487. <https://doi.org/10.1108/LM-09-2017-0089>

Sibiya, T., & Shongwe, M. (2021). South African Library and Information Science (LIS) students' perceptions, motivations and reasons for enrolling in the LIS program. *Libri*, 71(2), 159–170. <https://doi.org/10.1515/libri-2019-0041>

Woodford, C. J. (2024). Where are the scientists?: Representation of students with science backgrounds in MLIS programs in Canada. *The IJournal*, 9(2), 17–37.

Mapping of good practices in university libraries aligned with the development of digital competence from the perspective of the 2030 agenda

*Alessandra Monteiro Pattuzzo Caetano*¹

*Helen de Castro Silva Casarin*²

ABSTRACT: The objective was to identify the practices of Brazilian university libraries to achieve the Sustainable Development Goals of the United Nation 2030 Agenda. To conduct the research, an online questionnaire with nine questions was sent to 426 librarians, members of four professional WhatsApp groups. 37 librarians responded to the questionnaire. The results revealed that a parcel of Brazilian university libraries have contributed to achieving sustainable development objectives according to the Agenda 2030. Despite all the Sustainable Development Goals mentioned by the participants, the ones that stand out most are: Ensure inclusive, equitable, and quality education; Achieve gender equality and empower all women and girls; Reduce inequality within and between countries; Ensuring a healthy life and promoting well-being, and Ensuring sustainable production and consumption patterns. Librarians are taking actions to develop digital literacy in their academic community, but they pointed to the necessity of more preparation to exercise your role as an educator using active methodologies and digital educational resources. Few academic libraries offer activities to the external public. The results provide some examples that can inspire librarians in Brazil and beyond.

Keywords: university libraries, Sustainable Development Goals, Agenda 2030

¹ FAESA Centro Universitário, Vitória, and São Paulo State University, Marília, Brazil.
E-mail: apattuzzo@gmail.com | ORCID iD: <https://orcid.org/0000-0001-6291-8608>

² São Paulo State University, Marília, Brazil.
E-mail: helen.castro@unesp.br | ORCID iD: <https://orcid.org/0000-0002-3997-9207>

INTRODUCTION

The discussions on sustainability date back to the beginning of the 2000s, when member countries of the United Nations (UN) prepared a document, entitled “Millennium Development Goals”, to guide international sustainable development actions until 2015. With the assessment of results achieved with the proposition in 2015, the United Nations approved a new document with objectives and targets for the year 2030, aiming to reduce inequalities and the negative impact of man's actions on the planet. This document was called “Transforming our world: the 2030 Agenda for Sustainable Development”. The document includes 17 Sustainable Development Goals (Figure 1) and 169 targets to achieve them (Ruiz, 2020).

Figure 1 - UN Sustainable Development Goals (SDG)



Source: Sustainable Development Goals, 2022

Aligned with this movement, the International Federation of Library Associations and Institutions (IFLA) prepared the “Lyon Declaration on Access to Information and Development” (2014). This document, signed by Brazil, proposes that “[...] increasing access to information and knowledge across society, assisted by the availability of information and communications technologies (ICTs), supports sustainable development

and improves people's lives." Therefore, the Declaration highlights the role of libraries and other information providers in providing access to information and developing people's digital literacy, contributing to the promotion of sustainable development broadly. Since then, IFLA has been conducting a series of actions (events and publications) to train information professionals and promote the proposal for libraries that effectively contribute to sustainable development.

Brazil's discussions on the topic expanded in 2017, following the Brazilian Congress of Librarianship and Documentation, promoted by the Brazilian Federation of Library Associations, whose theme was "Objectives for the United Nations Sustainable Development: how libraries can contribute to the implementation of the 2030 Agenda" (Federação Brasileira de Associações de Bibliotecários, Cientistas da Informação e Instituições, 2017). This association has carried out several actions to promote the adoption of the 2030 agenda by Brazilian libraries. Therefore, there is a challenge to align the strategic planning of the library and the development of users' digital literacy in connection with the 2030 Agenda.

Considering this scenario, the following questions can be asked: Do Brazilian university libraries develop digital literacy activities from the perspective of the United Nations Agenda 2030? What are the good practices of university libraries that develop digital literacy aligned with the United Nations Agenda 2030? The objective of this study is to identify which practices were developed by Brazilian university libraries to achieve the SDG of the UN 2030 Agenda, seeking to highlight good practices to provide examples that can inspire more librarian professionals in Brazil and beyond.

THE SUSTAINABLE DEVELOPMENT GOALS (SDG) AND THE UNIVERSITY LIBRARIES

The 2030 Agenda is a commitment that involves all institutions, organizations, companies, including libraries, and people. One of the roles of the university library is to improve and facilitate the creation of knowledge in society. According to Rodrigues (2020, p. 101) "libraries

are critical institutions for achieving the Sustainable Development Goals. Public access to information allows people to make informed decisions that can improve their lives.” In other words, social groups and communities that have access to relevant information will be in a better position to “eradicate poverty and inequality, improve agriculture, offer quality education and promote health, culture, research and innovation”.

The International Federation of Library Associations and Institutions (IFLA) advocates that the achievement of sustainable development depends economically, socially and environmentally on access to information. Thus, libraries and other information providers play a key role allowing access to information and promoting the development of digital and information literacy. To expand the application of the SDG by libraries, IFLA, aligned with the UN, created a page entitled *Powering Sustainable Development*³, which contains a specific area dedicated to showing how libraries can contribute to the SDG. On this page, there are materials and tools to help libraries to support their work, and help them to make a difference in the lives of individuals and communities. The document “Access and Opportunity for all: How libraries contribute to the United Nations 2030 Agenda” (International Federation of Library Associations and Institutions, 2016) there are orientations about how libraries can get involved promoting SDG. Figure 2 contains examples of good practices that libraries can adopt to promote or support SDG:

Figure 2: Examples of the contribution of libraries to achieve the SDG

LIBRARIES CAN DRIVE PROGRESS ACROSS THE ENTIRE UN 2030 AGENDA	
UNITED NATIONS SUSTAINABLE DEVELOPMENT GOALS	
END POVERTY IN ALL ITS FORMS EVERYWHERE Libraries support this goal by providing... <ul style="list-style-type: none">· Public access to information and resources that give people opportunities to improve their lives.· Training in new skills needed for education and employment.· Information to support decision-making by governments.	END HUNGER, ACHIEVE FOOD SECURITY AND IMPROVED NUTRITION AND PROMOTE SUSTAINABLE AGRICULTURE Libraries support this goal by providing ... <ul style="list-style-type: none">· Agricultural research and data on how to make crops more productive and sustainable.· Public access for farmers to online resources like local market prices, weather reports, and new equipment.

³ <https://www.ifla.org/units/sustainable-development/>

<p>ENSURE HEALTHY LIVES AND PROMOTE WELL-BEING FOR ALL AT ALL AGES</p> <ul style="list-style-type: none"> Libraries support this goal by providing ... Research available in medical and hospital libraries that supports education and improves medical practice for health care providers. Public access to health and wellness information in public libraries that helps individuals and families stay healthy. 	<p>ENSURE INCLUSIVE AND EQUITABLE QUALITY EDUCATION AND PROMOTE LIFELONG LEARNING OPPORTUNITIES FOR ALL</p> <ul style="list-style-type: none"> Libraries support this goal by providing ... Dedicated staff who support early literacy and lifelong learning. Access to information and research for students everywhere. Inclusive spaces where cost is not a barrier to new knowledge.
<p>ACHIEVE GENDER EQUALITY AND EMPOWER ALL WOMEN AND GIRLS</p> <p>Libraries support this goal by providing ...</p> <ul style="list-style-type: none"> Safe and welcoming meeting spaces. Programmes and services designed to meet the needs of women and girls, like rights and health. Access to information and ICT that helps women build business skills. 	<p>ENSURE AVAILABILITY AND SUSTAINABLE MANAGEMENT OF WATER AND SANITATION FOR ALL</p> <p>ENSURE ACCESS TO AFFORDABLE, RELIABLE, SUSTAINABLE AND MODERN ENERGY FOR ALL</p> <p>Libraries support these goals by providing...</p> <ul style="list-style-type: none"> Access to quality information and good practices that support local water management and sanitation projects. Free and reliable access to electricity and light to read, study, and work.
<p>BUILD RESILIENT INFRASTRUCTURE, PROMOTE INCLUSIVE AND SUSTAINABLE INDUSTRIALIZATION AND FOSTER INNOVATION</p> <p>Libraries support this goal by providing ...</p> <ul style="list-style-type: none"> Widespread existing infrastructure of public and research libraries and skilled library professionals. Welcoming and inclusive public spaces Access to ICT like high-speed internet that may not be available anywhere else. 	<p>REDUCE INEQUALITY WITHIN AND AMONG COUNTRIES</p> <p>Libraries support this goal by providing ...</p> <ul style="list-style-type: none"> Neutral and welcoming spaces that make learning accessible to all, including marginalized groups like migrants, refugees, minorities, indigenous peoples, and persons with disabilities. Equitable access to information that supports social, political, and economic inclusion.

<p>MAKE CITIES AND HUMAN SETTLEMENTS INCLUSIVE, SAFE, RESILIENT AND SUSTAINABLE</p> <p>Libraries support this goal by providing ...</p> <ul style="list-style-type: none"> · Trusted institutions devoted to promoting cultural inclusion and understanding, · Documentation and preservation of cultural heritage for future generations. 	<p>ENSURE SUSTAINABLE CONSUMPTION AND PRODUCTION PATTERNS</p> <p>TAKE URGENT ACTION TO COMBAT CLIMATE CHANGE AND ITS IMPACTS</p> <p>CONSERVE AND SUSTAINABLY USE THE OCEANS, SEAS AND MARINE RESOURCES FOR SUSTAINABLE DEVELOPMENT</p> <p>PROTECT, RESTORE AND PROMOTE SUSTAINABLE USE OF TERRESTRIAL ECOSYSTEMS, SUSTAINABLY MANAGE FORESTS, COMBAT DESERTIFICATION, AND HALT AND REVERSE LAND DEGRADATION AND HALT BIODIVERSITY LOSS</p> <p>Libraries support these goals by providing ...</p> <ul style="list-style-type: none"> · Sustainable system of sharing and circulating materials that reduces waste Historical records about coastal change and land use. · Research and data needed to inform climate change policy. · Widespread access to information needed to guide decision-making by local and national governments on topics like hunting, fishing, land use, and water management.
<p>PROMOTE PEACEFUL AND INCLUSIVE SOCIETIES FOR SUSTAINABLE DEVELOPMENT, PROVIDE ACCESS TO JUSTICE FOR ALL AND BUILD EFFECTIVE, ACCOUNTABLE AND INCLUSIVE INSTITUTIONS AT ALL LEVELS</p> <p>Libraries support this goal by providing ...</p> <ul style="list-style-type: none"> · Public access to information about government, civil society, and other institutions · Training in the skills needed to understand and use this information. 	<p>STRENGTHEN THE MEANS OF IMPLEMENTATION AND REVITALIZE THE GLOBAL PARTNERSHIP FOR SUSTAINABLE DEVELOPMENT</p> <p>Libraries support this goal by providing ...</p> <ul style="list-style-type: none"> · Global network of community-based institutions, primed to support local

Source: International Federation of Library Associations and Institutions, 2016.

Figure 2 clarifies how libraries can become involved and work on the 17 SDG at the same time, developing essential activities to guarantee the exercise of human rights with access to quality information. Furthermore, they can also act in their spaces as privileged actors to raise awareness among their various users about the 2030 Agenda, and to promote the

personal involvement and mobilization of everyone in favor of the SDG. Good practices that may be developed with the academic community, and or, with the external community of higher institutions also contribute to the digital literacy of individuals who participate in the actions, activities and projects offered in this context.

In this sense, the library gains prominence and relevance in its educational role in terms of developing and offering a learning space linked to the process of transforming information into knowledge. A context that brings the challenge for university libraries to align the development of their users' digital literacy with the library's strategic planning in connection with the 2030 Agenda, offering good practices that can be developed with the academic community, and with the external community.

Using examples of good practices associated with the SDG, Rodrigues (2020, p.109) states that implementing the 2030 Agenda in university libraries is a duty of every librarian professional. The first thing we must do is "raise awareness, publicize, and support the initiatives that we know exist in our immediate environment, in the cities where we work, and be creative and create new initiatives that we can share, or in which they can help us help". The author also states the importance of having library staff aware of the 2030 Agenda and the SDG.

Aligned with the objectives of Agenda 2030, academic libraries of private or public institutions need to have sustainable development, and constantly expand their actions in activities that go beyond support education, research and extension, get involved with social, economic, cultural and environmental issues, promoting and providing free cultural actions to information, meeting without distinction to all users. In this way, libraries will be able to support the fulfillment of each of the 17 sustainable development goals, especially when we talk about developing digital literacy.

To understand how Library and Information Science (LIS) literature is discussing the role of university or academic libraries in promoting the 2030 Agenda, it was carried out a literature review about the themes. Meschede and Henkel (2019) mapped publications in LIS until 2018

directly dealing with sustainability and sustainable development. They found that Amanda Spink made the earlier discussion between LIS and sustainability in 1990's. She was the most frequent author between 1990 and 1995, with five articles published. Gobinda Chowdhury is one of the more frequent authors since 2010 and his speciality is: "the carbon footprint of the knowledge sector as well as sustainability of digital libraries and information services and proposes methods to measure environmental costs of digital libraries." (p.1378). Rocha et al. (2019) mapped the Brazilian publications about the actions made by libraries for the promotion of Agenda 2030. As a result, the study found that ODS 4 "Ensuring inclusive and equitable quality education and promoting lifelong learning opportunities for all" was most cited in the works analyzed. The kind of libraries that were cited in works analyzed and that are making actions for education and sustainable development are public, school, prison and university libraries. Just some publications related to sustainable development and information literacy and no one with digital literacy.

Yap and Kamilova (2020) present "the value of libraries in integrating SDG's into their work and how it can positively advocate for change toward attaining an inclusive, open and tolerant society." The study gathered opinions from participants of two library programs focusing on gender equality at Nazarbayev University.

The strategic implementation of SDG in the Chinese University of Hong Kong (CUHK) Library was investigated by Ma and Ko (2022). The results indicated that the CUHK Library supports the SDG through the following actions: encouraging healthy lives and wellness (SDG 3: Good Health and Well-being), reading promotion and digital and information literacy (SDG 4: Quality Education), stimulating innovation and creativity (SDG 9: Industry, Innovation and Infrastructure), and providing access to information (SDG 16: Peace, Justice and Strong Institutions). Mathiasson and Jochumsen (2022) conducted a literature review to provide an overview of and insights into a selected bibliography of 102 research publications on libraries, sustainability and sustainable development, including the UN Sustainable Development Goals, with focus on goals about environment

and green libraries. They found that the types of libraries most mentioned in the publications were academic and university libraries. The Dei and Asante's study (2022) explored the role of academic libraries in Ghana in the achievement of quality education as a Sustainable Development Goal. The results established that the majority of library staff were aware of the SDG 4. They concluded by offering a framework to guide the successful accomplishment of this SDG in libraries. Ensslin et al. (2022) reviewed the LIS literature about management of academic libraries from a sustainability perspective. The results showed that the literature about sustainability in library management is presented in a heterogeneous way. Thorpe and Gunton (2022) conducted a case study in the University of Southern Queensland (USQ) Library and identified how the library's services, projects, and action plans were allied to the SDG and how the mapping exercise was communicated to the community.

Inomata, Garcia, and Progene (2023) investigated the scientific production of university libraries and specifically the SDG 5, regarding gender equality. The results indicate that articles addressed the topic of female presence in library management and on the topic of LGBTQIA+ in university library collections; Gender-based violence or equality; Women and science; women's equality. Fedorowicz-Kruszewska's (2023) article highlights that, although the theme of sustainable development has been widely discussed since the 1990s, the body of Library and Information Science (LIS) literature does not reflect the importance of this issue. The issue of the green library is related to the environmental dimension of SDG. For the author, the implementation of the green library concept "[...] contribute to the achievement of selected SDGs and accept the responsibility of educating users about ES, thus increasing their social impact" (p.116). The author discusses the possible reasons for the "still-low interest" of LIS in the issue of green libraries and identifies the barriers in the development of the concept of green libraries in both theoretical and practical dimensions: "The ambiguous definition of a green library, perceived as the main obstacle; A lack of guidelines for green libraries; A lack of evaluation criteria for green libraries; The insufficient promotion of the nature and objectives of environmental education; A lack of well-

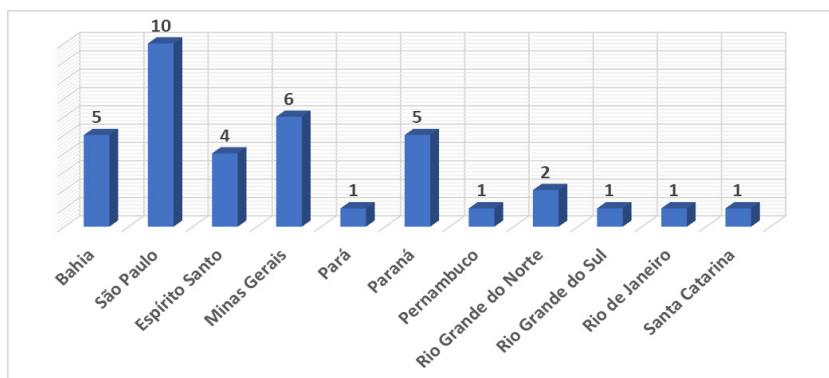
developed tools for monitoring progress towards SDGs in environmental terms at a national level; Limited coverage of environmental sustainability in LIS programmes.” (p.113)

RESEARCH METHODS

To conduct this research, an online questionnaire with nine questions was sent to all members of four WhatsApp groups composed by 426 librarians who work in Brazilian university libraries at public and private institutions located in different regions of the country. These are closed groups managed by a librarian who also works as a researcher or is a professional reference in the area. After three months that the questionnaire was sent, just 37 (8,7%) answered. To ensure anonymity, the names of the participants were replaced with codes L1 to L37.

Regarding the profile of the participants, the first variable verified was the type of institution the participants are affiliated. The results showed that 65% (24) of participants are from public institutions, and 35% (13) from private institutions, that is, the respondents work mainly in government institutions. Graphic 1 shows a distribution of participants by the Brazilian State. Participants were from 11 of the 26 States of Brazil (Graph 1).

Graph 1 - Distribution of research participants by Brazilian State



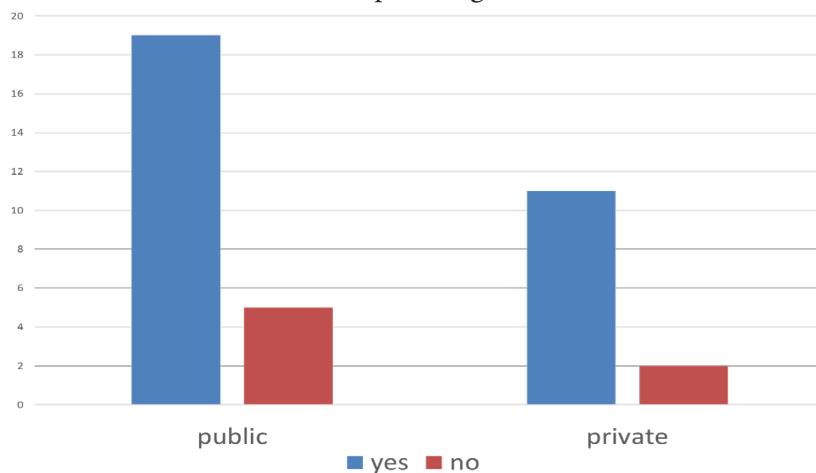
Source: Research data, 2022.

The Brazilian states that the major number of librarians of the study is São Paulo, with 10 participants, followed by other Southeast's States (Minas Gerais, Espírito Santo and Rio de Janeiro) totaling 25 participants. There are eight participants from states of the North East region (Bahia, Rio Grande do Norte e Pernambuco), seven participants from the South region (Paraná, Santa Catarina e Rio Grande do Sul) and just one from North (Pará). The results will be presented in the next session.

PRESENTATION AND ANALYSIS OF RESULTS

The results obtained were included in a spreadsheet and analyzed qualitatively and quantitatively. In the first question we ask whether they use the 17 Sustainable Development Goals of the United Nations (UN) Agenda 2030 as a parameter for planning activities. As Graph 2 shows, public institutions tend to use the SDG for planning their activities more than private ones. Perhaps the reason for that is because the activities of libraries in Brazilian private higher education institutions are more restricted, mainly supporting teaching activities and assisting in the use of documentation standards, as there is rarely research.

Graph 2: The use of the Sustainable Development Goals (SDG) by librarians in planning activities



Source: research data (2022)

Following this, we asked which Sustainable Development Goal of the UN Agenda 2030 they use in library planning activities. In Graphic 3, we noticed that every 17 SDG were mentioned at least twice. The most cited was SDG 4, probably because university libraries are linked to educational institutions, similar to those results founded by Rocha et al. (2019) and Dei and Asante (2022). The SDG last indicated were: SDG 2 - Zero hunger; SDG 7 – Affordable and clean energy; SDG 14 – Life below water and SDG 15 – Life on Land, probably because these topics are not related to the core activities of libraries, although the theme of green and sustainable libraries are already on the agenda of libraries, as the theme of this event, for example. Just one librarian cited that he/she uses all 17 SDG for planning their activities.

Graphic 3: Sustainable Development Goal used by Brazilian librarians for planning their activities



Source: research data, 2022

In the next question we ask them to specify which activities they develop for which SDG. Just one participant (L3) specified the activities she/he developed. The answers are in Table 1:

Table 1: Activities developed by one Brazilian academic library and the SDGs

SDG	Actions and activities of libraries related to which SDG
1 NO POVERTY 	Courses and workshops, and organization of bazaars and actions meet this objective.
2 ZERO HUNGER 	The library has a collection about the SDGs and has access to scientific information through Capes Databases. ⁴ Develops food collection campaigns, such as the “Solidary Negotiation” campaign.
3 GOOD HEALTH AND WELL-BEING 	Provides Podcasts on the topic of mental health and well-being.
4 QUALITY EDUCATION 	Offering services to encourage reading such as the “Library Passport”, the “Care For Me” Project, Storytelling, the “Forget a Book” project. My institution has a school library and a public library in partnership with Lions Club International.
5 GENDER EQUALITY 	Tribute paid to the first librarian and first director by naming the Central Library after her contributed to the empowerment of women and in this case a black woman. Offer of a “Care Course” which services were addressed to the LGBTQIIA+ community, showing a concern for gender identity. Dear availability on women and feminism.

⁴ That is a Portal for scientific databases maintained by the Brazilian Federal Government. For more information access: www.periodicoscapes.gov.br.

<p>6 CLEAN WATER AND SANITATION</p> 	<p>Provides collections on the topic and databases through the CAPES Portal.</p>
<p>7 AFFORDABLE AND CLEAN ENERGY</p> 	<p>Provides collections on the topic and databases through the CAPES Portal.</p>
<p>8 DECENT WORK AND ECONOMIC GROWTH</p> 	<p>In addition to its collection and access to databases, it offers training courses and workshops, such as: Library organization, Library assistant, Citizen service, Document management, Bibliographic standardization. Contributing to training and preparing for the job market. (L.3)</p>
<p>9 INDUSTRY, INNOVATION AND INFRASTRUCTURE</p> 	<p>It has a collection on innovation, seeking to integrate information and communication technologies (ICT) into all activities, products and services offered.</p>
<p>10 REDUCED INEQUALITIES</p> 	<p>It is concerned with access to information, digital inclusion, spaces accessible to wheelchair users, Braille and digital collections. There is the booklet Equals in the world of differences: attitudinal accessibility.</p>
<p>11 SUSTAINABLE CITIES AND COMMUNITIES</p> 	<p>It works, encourages and disseminates culture and cultural heritage since its creation, through cultural and extension activities.</p>

<p>12 RESPONSIBLE CONSUMPTION AND PRODUCTION</p> 	<p>It develops several actions related to this theme, reusing paper, printer coils, and adopting glass cups for drinking water and coffee.</p>
<p>13 CLIMATE ACTION</p> 	<p>It seeks a conscious use of light and water, and is concerned with creating and maintaining green areas around its libraries.</p>
<p>14 LIFE BELOW WATER</p> 	<p>Send data to ASFA Database - Aquatic Sciences and Fisheries Abstracts - A database on the science, technology, management and conservation of saltwater and freshwater marine resources and environmental resources.</p>
<p>15 LIFE ON LAND</p> 	<p>It contributes to this objective through its collection, its databases and its Podcast "Speakup Julieta!"</p>
<p>16 PEACE, JUSTICE AND STRONG INSTITUTIONS</p> 	<p>Through its campaigns, it seeks responsibility in a more inclusive society. Campaigns such as: Pink October, Blue November.</p>
<p>17 PARTNERSHIPS FOR THE GOALS</p> 	<p>Aims at sustainable development, creates actions that enable the sustainability of the library, such as the Campaign to negotiate sanctions regarding the delay of books, where the penalty for delay is reversed by the exchange for a book to form the literary collection of one of the libraries in the System.</p>

Source: Research Data, 2022

It was asked if they offer activities / actions / projects for the development of the digital literacy of users. 31 of the 37 participants answered that they offer activities to develop the digital literacy of users and six answered that they don't offer this kind of activity.

Following, we asked librarians to describe the activities/actions or projects they offer to develop the user's digital literacy. Twenty-eight subjects answered this question, and six didn't answer. Three subjects simply informed that "Does not carry out any type of activity that develops digital competence" and one participant justified why they don't do these activities: "I do not develop it, as the undergraduate school already works on this topic in the classroom and in university extension." The answers are in Table 2.

Table 2: Activities/actions or projects offered by Brazilian libraries to develop the user's digital literacy and target audience

Activities/actions or projects	faculties	students	external public	University staff
1. Training for use of new technologies (L.1).	x	x		
2. Training for access to the Database of CAPES Portal and the library system called Pergamum (L.3).	x	x		
3. Training for search in scientific databases (L.4).	x	x		
4. Training for use of information sources for research (L.5).	x	x	x	
5. Training for use of the platform of ebooks and Book club online (L.7).	x	x		
6. Instruction about the use of professional e-mail; Training for use of G Suit (google) resources; Training for access to and use databases and digital libraries; configuration of cell phones and notebooks to access the Wi-Fi network; use of text editor resources; offering a computer for internet access and writing academic work, etc. (L.8)	x	x		

Activities/actions or projects	faculties	students	external public	University staff
7. Presentation of library and training of library system (L.9).		x		
8. Training in the use of the Capes Periodicals database and virtual databases in the area of Health; CV filling workshops on the Lattes platform ⁵ ; Free course on internet research strategies; Free course in Preparing academic works and scientific writing; Workshops on using Word. (L.10).	x	x		
9. Training for search in scientific databases and for consulting the library's webpage (L.12);		x		
10. Orientation for search in scientific databases (L.13);		x		
11. Dissemination through media (social networks) of library products, such as reading tips, new acquisitions on digital platforms (L.14).	x	x		
12. Library as a digital empowerment center (for all ages), access to free online technology courses and 2 - Events for female empowerment, lectures and cultural actions (L.15).	x	x	x	x
13. STARTECA extension project (pre-startup + library), a space for entrepreneurship, which comprises an active role of the university library in the context of the entrepreneurial university, supporting and acting in the development of technology-based ventures, through the development of skills in intellectual property in search of precedents, business plans, technological prospecting, using specialized computational tools in metric studies of patent documents and scientific articles indexed in scientific and/or technological databases (L.16).	x	x		

⁵ A Federal government platform for CV of researcher register

Activities/actions or projects	faculties	students	external public	University staff
14. Through library projects to encourage academic publishing, developing autonomous digital skills so that the user is empowered in the use of tools (L.17).		x		
15. Training users to make the best use of the Library and its information resources in physical and digital media. Short courses and lectures in the areas of Management and media information skills, among other initiatives and actions (L.19).	x	x		x
16. Events, lectures, exhibitions, lives, training (L.21)	x	x	x	x
17. We offer training for guidance and answering questions about the use of databases, use of bibliographic management software, among others (L.22).	x	x		
18. Workshops for academic research, workshops on the use and demonstration of virtual library resources, lectures on the standardization of academic research (L.24);	x	x		
19. Social Action Projects - Project People reading Generates people Reading (book donation), Project Throwing for the Future with They (action to support girls from a non-governmental organization close to the college), Solidarity Hazing Projects (L.24).			x	
20. Training in various research tools and platforms for researchers, and in Wikimedia projects, as an extension to teaching and research (L.26).	x	x		
21. Training to combat Fake News (L.27).		x		
22. Tool training, discussions, sharing on social media (L.29).	x	x	x	
23. Development of a search strategy using connectors, Boolean operators, wildcards to improve searches (L.31).	x	x		

Activities/actions or projects	faculties	students	external public	University staff
24. Traveling library, assistance with research in activities at the Library (L.32).	x	x	x	
25. Training, individual and research group consultations, publications on social networks, videos and online tutorials (L.33).	x	x		
26. Training for research in databases for the internal community (L.34).	x	x		
27. Access to the online catalog, Library software app, access to databases, e-book collection (L.35).	x	x		
28. Through social networks he managed to raise awareness about literacy (L.37).	x	x		

Source: Dados da pesquisa, 2022.

The answers of this question reveal some highlights. The activities most cited were related to the library and its resources, such as: Training for search / use library online catalog, library App, database, and e-book collection or Instructing how to construct search strategies. Some answers demonstrate a concern of librarians in the empowerment of users:

“Library as a Digital Empowerment Center (for all ages), access to free online technology courses and events for women’s empowerment, lectures, and cultural actions” (L.15)

“Encouraging academic publication project developing autonomous digital skills so that the user is empowered in the uses of tools” (L.17)

Others are focused challenges outside the libraries: Training in Wikimedia projects; Fighting Fake News. One librarian cited an Innovative project called STARTECA, which is the combination of the words libraries and startup (startup + library in Portuguese). This project is offered to teachers and students, who work on digital and information literacy together, aligned with innovation, entrepreneurship and scientific

initiation for undergraduate students. Unfortunately it does not apply to the external public.

Next question approached the importance of developing and fostering the digital literacy of the academics and the external community of the library. All participants recognized it, and two didn't justify their answers. The responses were grouped by theme.

The justification of the importance of teaching digital literacy most mentioned was because digital literacy is an ability necessary nowadays for both academic activities and professional activities outside the university. It was the reason for 14 participants, as we can see in following examples: “being in connection with the world and with the new skills necessary for personal and global development” (L3) and “Developing digital competence is as important as developing reading competence, as individuals who consciously use technologies have more chances of success both at work and in their personal lives.” (L8). Autonomy is the second reason more mentioned for some participants, in order to make their research more effective, for example. In the other hand, some respondents associated autonomy which critical thinking, as we see in the extract: Extremely important, because in the information society it is essential that everyone has a minimum amount of knowledge to autonomously search for reliable and quality data and information, with the critical capacity to analyze them and the creativity to create new knowledge. (L35). Other two participants highlighted the importance of digital literacy for selecting quality information. Three mentioned the contribution of libraries for user, mainly the students, but also external users, as demonstrate the example: “In addition to the role of university professors, librarians can and should share the leading role in contributing to the development of skills for the better use of digital and virtual information resources, both for the internal public and for the external community (L20)”

Two participants pointed out the association between digital literacy and information literacy and media literacy: “Digital literacy is considered a component of information literacy, essential for academic and social life in contemporary times (L14)” and “Currently, it is not possible to dissociate information literacy from media and digital literacy,

as we live in the Digital Age. Today any request and access to information is via the internet, through digital information systems (L27)". Two participant librarians also mentioned the contribution of digital literacy for development of technology and science, like illustrate the example:

For the academic community, the development of skills is strategic for the incorporation of scientific and technological knowledge in scientific and/or technological research, and also for promoting successful technology-based ventures in the academic context. For society, especially lay citizens, the development of skills contributes to the appropriation of science and technology in their social practices, enabling non-specialist citizens to make inferences about the impacts of scientific and/or technological development on their lives, and also, contributes to the technological development of the productive sector, by bringing academics closer to the productive sector. (L.17)

Other three librarians emphasized the social contribution of teaching digital literacy for inclusion of people, as well as encouraging a more collective look at the diverse problems in our society and how we can all look for solutions. Two librarians pointed out the difficulties related to teaching digital literacy, regarding insufficient teams, scarcity of resources, work overload, knowledge about how to incorporate technology into users' learning experiences and library training strategies.

Analyzing the statements, it is noted that they meet target 9.c, "Significantly increase access to information and communications technology and strive to provide universal and affordable access to the Internet for the least developed by 2020." of SDG 9 , as well as target 17.8, of SDG 17, which foresees "To make fully operational, by 2017, the technology bank and the mechanism to support training in science, technology and innovation for least developed countries and increase the use of enabling technologies , in particular information and communication technologies."

The SDG and the goals described provide guidelines for the activities of libraries, in this research, especially university ones, to guarantee not only access to reliable information, but also promote the actions of investigating

and having autonomy in the search for knowledge and education, in a critical way and reflective, being the protagonist of their knowledge.

In question 8, the participants were asked about the pedagogical practices that they used for teaching digital literacy. 34 answered. Three librarians highlight the difficulties about the theme, saying, for example that “Unfortunately, as librarians, we do not have knowledge about educational or pedagogical practices.” (L.34).

In Figure 3, are the pedagogical and/or educational practices mentioned by participants.



Source: Research data, 2022

As can be noted in figure 3, the main practice is training online and in person. Training in general is used to teach about the resources of the library, like catalog, databases, so, the focus seems to lay on the library and not on other resources outside the library that should be to prepare autonomous citizens. Just five librarians mentioned the use of active methodologies (L 11, L15, L22, L25 and L27). The reason for that can be in the answers of some participants: “Unfortunately, we have no knowledge, as librarians, about educational or pedagogical practices.” (L.35) and “I

don't use it directly, we still adopt traditional methodologies. But I know we need to bring the debate" (L37). This indicates that the higher education institutions and associations needs to prepare the Brazilian librarians to work with active methodologies, so that they can effectively contribute to the teaching-learning process of the academic community in compliance with SDG 4. Librarians, aware of the importance of their role as educators, must be willing to participate in didactic-pedagogical training courses and request specific training on this from institutions where they work. Some respondents also indicated the tools that they use: Jambord, social media (instagram, facebook, X), mentimeter, Google Classroom, TeleCentro.

The pedagogical and/or educational practices illustrated in Figure 2 are connected to SDG 4 – "Quality Education". This objective has 10 targets, being one of the SDGs that is most linked to the activities carried out by libraries. What stands out in the answers to question 8 is SDG target 4.4: "By 2030, substantially increase the number of youth and adults who have relevant skills, including technical and vocational skills, for employment, decent jobs and entrepreneurship". In other words, libraries can carry out workshops, courses, mentoring, use of training tools and services, and information products that are specific to this goal. Regarding the last question (question 9): "Have you, as a librarian, had any experience of developing digital competence?" Twenty-nine (29) answered that they had participated and five said that they never participated and one that didn't understand the question. Some librarians commented on their response.

Some librarians mentioned the kind of experience, for example: offering training, workshops; Teaching classes; use of digital platforms to compose course bibliographies [to help faculties]. Six librarians mentioned the necessity of preparation to perform the activities for promoting digital literacy, participating in training on research in databases and other themes like plagiarism, scientific writing, participating in events in the area and about teaching techniques. One librarian commented the impact of pandemic in how she/he deal with technology: "Because of the pandemic, we had to learn to use new technologies, in order to continue offering a quality service to our users, we had to adapt, and with that we had to

acquire new skills" (L.1). Some mentioned the benefits of developing digital literacy for the students that include, for example: consciously searching the internet, avoiding/identifying the "fake news". And one librarian cited the experience of developing digital literacy for the public outside the university: "Teach elderly people how to use computers using library computers". (L.5)

In the answers, it is possible to see a scenario in which the librarian professional needs to manage not only the activities directly linked to library management, but also to information management and the processes of appropriation of information by users. They mention different aspects related to their preparation for teaching and working with technology and digital literacy and some benefits for their users.

CONCLUSIONS

The main objective of this study is to identify the practices of Brazilian university libraries to achieve the Sustainable Development Goals of the United Nation 2030 Agenda.

It was noticed that faced with so many changes in the field of higher education, which directly reflect on the role of the university library, the librarian needs to redefine the library as a space for exchange, for the construction of knowledge that favors collaboration and the autonomy of users, whilst reaffirming the library as a learning space, a place for research and study, adding the status of a space for culture, leisure and updating. As a guide for university libraries to plan their services and space, the 2030 Agenda can be considered essential, providing the university's internal and external community with services that develop digital competence for internet access and reliable information, providing inclusion and welcoming of individuals and improvements for society.

Although we were unable to obtain responses from many university libraries participating in the groups used for data collection, there was participation from librarians from different regions of Brazil and from public and private institutions, but they provide a very broad overview of

the topic investigated. It was triggered to answer the questions: Do Brazilian university libraries develop digital literacy activities in the perspective of United Nation Agenda 2030? The research made it possible to identify that the 37 university libraries participating in the study have been guided by some of the 17 SDGs of the 2030 Agenda for the planning and development of practices, actions and projects. A brief panorama revealed based on the results, allows us to affirm that a parcel of Brazilian university libraries of this study have contributed to achieving the sustainable development objectives according to the UN Agenda 2030.

Despite all the SDGs have been mentioned by the participants, the SDGs: 4 - Ensure inclusive, equitable and quality education, and promote lifelong learning opportunities for all; 5 - Achieve gender equality and empower all women and girls; 10 - Reduce inequality within and between countries; 3 – Ensuring a healthy life and promoting well-being for everyone, at all ages and 12 – Ensuring sustainable production and consumption patterns, are the ones that stand out most in the research.

What are the good practices of university libraries that develop digital literacy aligned with the United Nation Agenda 2030? There is a highlight for the provision of training, training and courses for searching for databases, journal portals, virtual libraries, search strategies, library physical collection software, elaboration of academic works and scientific writing for teachers and students. The external community isn't the main target, with few exceptions that offer activities like events, lectures, exhibitions, lives, and teaching how to use the computer.

The results are relevant to provoke reflection among librarians and Information Science researchers, with a view to planning and offering digital competence programs aligned with the 17 sustainable development objectives of the UN 2030 Agenda and its targets, as well as ways of its monitoring and evaluation, covering not only the academic community but also the external community.

REFERENCES

Dei, D.-G. J., & Asante, F. Y. (2022). Role of academic libraries in the achievement of quality education as a sustainable development goal. *Library Management*, 43(6/7), 439-459. <https://doi-org.ez87.periodicos.capes.gov.br/10.1108/LM-02-2022-0013>

Ensslin, L., Dutra, A., Ensslin, S. R., Moreno, E. A., Chaves, L. C. & Longaray, A. A. (2022). Sustainability in library management in higher education institutions: A bibliometric analysis. *International Journal of Sustainability in Higher Education*, 23(7), 1685-1708. <https://doi-org.ez87.periodicos.capes.gov.br/10.1108/IJSHE-07-2021-0302>

Federação Brasileira de Associações de Bibliotecários, Cientistas da Informação e Instituições (2017). *Relatório XXVII Congresso Brasileiro de Biblioteconomia e Documentação e Ciência da Informação*. São Paulo, 2017

Fedorowicz-Kruszewska, M. (2023). Green libraries: Barriers to concept development. *Library Management*, 44(1/2), 111-119. <https://doi-org.ez87.periodicos.capes.gov.br/10.1108/LM-04-2022-0041>

Inomata, D. O., Garcia, M. P. C., & Progene, P. de N. C. (2023). *Bibliotecas universitárias e a Agenda 2030: Uma análise da produção científica sobre o ODS 5*. Anais do XXII Seminário Nacional de Bibliotecas Universitárias (Eixo 3). Federação Brasileira de Associações de Bibliotecários, Cientistas de Informação e Instituições, São Paulo. <https://portal.febab.org.br/snbu2023/article/view/2961>

International Federation of Library Associations and Institutions. (2016). *Access and Opportunity for All: How Libraries contribute to the United Nations 2030 Agenda*. Retrieved from <https://repository.ifla.org/handle/123456789/243>

International Federation of Library Associations and Institutions. (2014) *Lyon Declaration on Access to Information and Development*. Retrieved from <https://repository.ifla.org/handle/20.500.14598/3498>

Ma, L. F. H., & Ko, L. Y. (2022) Supporting the Sustainable Development Goals: The Role of the Chinese University of Hong Kong Library. *Journal of Academic Librarianship*, 48. <https://www.sciencedirect.com/science/article/pii/S009913322000787>

Mathiasson, M. H., & Jochumsen, H. (2022). Libraries, sustainability and sustainable development: a review of the research literature. *Journal of Documentation*, 78(6), 1278-1304. <https://doi.org/10.1108/JD-11-2021-0226>

Meschede, C., & Henkel, M. (2019). Library and information science and sustainable development: a structured literature review. *Journal of Documentation*, 75(6), 1356-1369. <https://doi-org.ez87.periodicos.capes.gov.br/10.1108/JD-02-2019-0021>

Rocha, E. S. S., Alves, A. P. M., & Ferrari, A. C. (2019). *Ações brasileiras e a agenda 2030: Mapeamento de práticas em prol dos objetivos de desenvolvimento sustentável*. <http://eprints.rclis.org/38785/>

Rodrigues, M. I. G. (2020, julho/dezembro). A implementação dos ODS da Agenda 2030 em bibliotecas universitárias. *Boletim Associação Bibliotecários da Andaluz de Bibliotecarios*, 120, 101-121.

Ruiz, J. N. (2020). As bibliotecas aplicam os objetivos de desenvolvimento sustentável? Sim, mas não? *Boletim Associação Bibliotecários da Andaluz de Bibliotecarios*, 120, 38-100.

Sustainable Development Goals (SDGs). Disponível em: <https://www.un.org/sustainabledevelopment/news/communications-material/>. Acesso em: 2022.

Thorpe, C., & Gunton, L. (2022). Assessing the United Nation's Sustainable Development Goals in academic libraries. *Journal of Librarianship and Information Science*, 54(2), 208-215. <https://doi.org/10.1177/09610006211005528>

Yap, J. M., & Kamilova, Y. (2020). Toward becoming an inclusive library: Integrating Sustainable Development Goal 5 in the library agenda. *Library Management*, 4(2/3), 53-66. <https://doi-org.ez87.periodicos.capes.gov.br/10.1108/LM-08-2019-0057>.

Smart Cities and the 2030 Agenda for Sustainable Development: considerations on public libraries' role in Brazilian National Policy on Smart Cities

*Camilla Castro de Almeida*¹

*Elisabete Gonçalves de Souza*²

ABSTRACT: Smart cities are intensely interconnected urban centers that have infrastructure that enables efficient governance, innovation, knowledge sharing and citizen participation, in order to mitigate urban problems without compromising natural resources for future generations. In this setting of urban development, digital inclusion becomes an imperative factor, not only in its infrastructural form, but considering the proper use of networks to increase citizens' interest in using digital environments to improve their surroundings. Since the city is a historical-cultural materialization of a social reality, it is understood that the public library conditions and is conditioned by urban space, facilitating active citizenship and consolidation of social rights. The objective of this work is to discuss the role of the public library in the National Policy on Smart Cities, under discussion in the Brazilian Congress since 2021, with emphasis on what the Sustainable Development Goals of the 2030 Agenda advocate. This is an exploratory and documental research, with qualitative approach, with content analysis of Bill no 976/2021 and 2030 Agenda. The results refer to the reductionist view reserved for public libraries in the policy and

¹ Federal Fluminense University, UFF, Brazil.
E-mail: camillaalmeida@id.uff.br | ORCID ID: <https://orcid.org/0000-0003-0386-6902>

² Federal Fluminense University, UFF, Brazil.
E-mail: elisabete@id.uff.br | ORCID ID: <https://orcid.org/0000-0001-907-6017>

discuss the role of public libraries in the context of Brazilian urban centers based on information actions that these institutions have undertaken in order to align with the sustainable development goals. It is concluded that the recognition of the public library as a fundamental public policy actor, with objectives congruent with the 2030 Agenda, is important so that local strategies relevantly include it in their smart city projects.

KEYWORDS: Smart cities, Sustainable Development Agenda, Brazilian National Policy on Smart Cities, Public libraries.

INTRODUCTION

Smart cities are defined as intensely interconnected urban centers that have infrastructure that enables efficient governance, opportunities for innovation, knowledge sharing and, mainly, citizen participation, in order to mitigate numerous urban problems.

Social participation and citizen quality of life are explicitly mean and objective in the literature on this model of urban development. Initiatives for smart cities are a mix of hard (energy and natural resources, mobility and buildings) and soft (quality of life, government, economy and people) domains (Schöpfel, 2018), however, some governments, such as Brazilian federal government, are too focused on infrastructure problems (availability of networks and computers), paying little attention to social issues that involve the use of digital technologies, such as information literacy, political-social engagement and encouragement of citizens in public discussions. In this scenario of urban and technological development, digital inclusion is an imperative factor, not only in its infrastructural form, but considering the appropriate use of networks aimed at increasing citizens' interest in using digital environments to improve their surroundings.

Currently, despite the inequality of access to infoways (mainly in peripheries), some Brazilian cities, especially in metropolitan regions in the South and Southeast of Brazil, have satisfactory infrastructure for the technological convergence intended in the smart cities model. This ubiquitous computing infrastructure is mainly composed of information and communication technologies, such as geographic information systems, data transmission systems, communication standards, wireless sensor networks (Internet of Things), processing of large volumes of data

(Big Data) and cloud storage. However, as it is a huge and very unequal country, only a few cities already have structure and policies well defined for this context.

Therefore, increasingly, this public administration model receives incentives at global, national, state and municipal levels. At a national level, Bill of Law n. 976/2021 is being processed in the Chamber of Deputies, which will establish the National Policy on Smart Cities (PNCI), a public policy that includes guidelines, objectives and elements for federal and municipal planning and action. Currently, this bill is being processed in the legislative house, specifically under evaluation by the Constitution, Justice and Citizenship Committee (CCJC) of the Chamber of Deputies since July 2022.³

In Brazil, we can highlight three major challenges for digital inclusion: i) high cost of service and low network capillarity; ii) need of training in internet use (media literacy); and iii) provision of quality public services in a digital environment. Therefore, the urban management model of smart cities presupposes that the population has access to technological infrastructure, is politically engaged and has skills for citizen participation.

It is a context that involves sociocultural difficulties and social contradictions, therefore it is appropriate, especially since it is a policy still in drafting phase, to reflect on the action of information policy, relating actors, technologies, representations, norms, and regulatory standards that configure implicit or explicit information policies. For that reason, in this chapter, we highlight the public library as a social actor and the 2030 Agenda as a macro policy that conditions the PNCI.

The public library is an institution that exists to meet the informational needs of citizens in an inclusive way. Since the city is a historical-cultural materialization of a social reality, it is understood that the public library, as a cultural equipment that encourages creativity and citizen participation in the community, conditions (and is conditioned by) urban space, facilitating active citizenship and consolidation and enforcement of social rights.

³ In June 2023, CCJC's deadline for amendment submission ended. The committee did not present amendments to the project.

Despite the recognition in scientific literature and macro policies that indicate the public library as a space for citizen interaction and articulation, such as *IFLA-UNESCO Public Library Manifesto* (IFLA, 2022), *IFLA Public Library Service Guidelines* (Koontz & Gubbin, 2013) and *IFLA/UNESCO Internet Manifesto Guidelines* (IFLA, 2006), the institution has closed many doors in Brazil in recent years. According to the latest update (2022-2023) of the National Public Library System (SNBP), Brazil has 5,318 public libraries. Currently, the country has 5,318 public libraries to serve approximately 203 million people (IBGE, 2023). Therefore, a public library serves more than 38,000 people. Ten years ago, in 2014, this proportion was one public library to attend to 33,000 people (Reis, 2014).

The objective of this chapter is to discuss the role of the public library in the National Policy on Smart Cities, still in progress in Brazilian Congress since 2021, in the form of Bill of Law n. 976/2021, with an emphasis on what the Sustainable Development Goals (SDGs) advocate. The SDGs are a set of goals expressed in the 2030 Agenda for Sustainable Development, a global political agenda agreed in 2015 at the United Nations Assembly, which guides public policies in different areas and around the world.

RESEARCH METHODS

To achieve the objective of the chapter, which is part of a broader study that addresses the perspectives of public libraries' engagement in this model of urban development, exploratory and documentary research was carried out, with a qualitative approach, which included content analysis of Bill of Law n. 976/2021 and the 2030 Agenda (in particular 22 of the 169 agreed targets).

Twelve SDGs from the 2030 Agenda were analyzed, distributed across 22 goals that, in some way, are related to public libraries' social function, with information actions carried out in Brazilian public libraries based on experience reports found in scientific literature, news outlets and government websites, with the purpose of verifying whether and how

Brazilian public libraries, within their possibilities, meet the global goals of the main global political agenda that underpins the PNCI.

To support the discussion, we chose to identify information actions because, according to Gil (2002), experience reports express a type of knowledge production that qualifies descriptive studies, helping us to describe phenomena through the establishment of empirical relationships, being a relevant technique for understanding social phenomena, their limitations and possibilities for intervention.

Thus, based on the inferences about the role of public library concerning the analysis of the PNCI and the survey of information actions that contribute to the fulfillment of the SDGs of the 2030 Agenda, it is expected to discuss the perspectives of engagement of public libraries in this context, so that citizens can effectively participate in a participatory, sustainable and technological urban development project.

LITERATURE REVIEW

The concept of *smart city* appeared for the first time in the 1990s, with the purpose of conceptualizing the phenomenon of urban development that depends on technology, innovation and globalization, especially from an economic perspective (Rizzon *et al.*, 2017). Until the middle of the first decade of the 2000s, the ecological dimension of this concept was not frequently articulated, although stopping climate change was also an important factor in the use of some sustainable technologies available at the time. The industry's discourse indicated urban development dependent on technology, innovation and globalization, with technological solutions that increased efficiency and reduced cities' costs (Morozov & Bria, 2019). As time passed and these discussions went beyond market, social participation and sustainable development became keys to the concept. Today, this is observed both in academic literature and standards on the subject.

Nowadays, in general, smart cities express the notion of intensely interconnected urban centers that enable efficient governance and social

participation, in favor of sustainable urban development. It is a model that has different motivations. According to Morozov & Bria (2019), the motivations for cities to opt for technological solutions for governance are diverse, but those of a normative and pragmatic nature predominate. Normative motivations encompass the possibility of achieving universally accepted but ambitious political goals, such as the political participation of citizens, the personalization of public services in a digital environment, the reduction of bureaucracy and the promotion of creativity and innovation. Pragmatic motivations encompass more diverse and specific objectives for urban centers, such as strengthening public safety, reducing traffic, efficient disposal of waste that clogs the streets, among other issues.

Rizzon et al. (2017) listed five essential characteristics of smart cities: i) incorporation of information and communication technologies into the urban fabric; ii) development with a neoliberal approach to governance; iii) focus on the social dimension based on the creativity of the population; iv) adoption of programs aimed at social learning and education; v) focus on sustainability (p.128).

Nicos Komninos (2009), highlighting the importance of information and knowledge in this process, states that smart cities offer “[...] skills, institutions and virtual spaces of cooperation sustaining the creation of new knowledge (research), monitoring knowledge flows (intelligence), disseminating existing knowledge (technology transfer), applying knowledge (innovation), developing new activities based on knowledge (incubation) and managing knowledge remotely (e-government).” (p. 339).

In the conception of Desouza and Flanery (2013), people are the main actors in the development of smart cities. It is citizens who shape social, economic, environmental and governance standards. Furthermore, they are the ones who generate data, which is fundamental for the construction and feeding of the indicators that enable the State's decision-making.

Lemos (2013) defines “smart citizen” as a:

[...] concept in which people also become producers of information. With accessible knowledge closer to their daily activities, they can not only have a better perception of the space where they live, but also propose creative and innovative solutions for their cities. (p.48)

“Smart city initiatives are a mix of hard (natural resources and energy, transport and mobility, buildings) and soft (living, government, economy, and people) domains” (Schöpfel, 2018, p.5). According to the author, these domains are often separated, and the focus of studies and initiatives is on heavy domains, neglecting the fundamental aspect of citizens’ personal development (Schöpfel, 2018).

For this reason, State intervention is necessary, balancing interests in favor of citizens. Within the scope of developing public policies to develop Brazilian urban centers, mitigating the daily problems of these specific spaces, as already mentioned, we have the PNCI proposal, which indicates that a smart city is a

Urban space oriented towards investment in human and social capital, sustainable development and the use of available technologies to improve and interconnect cities’ services and infrastructure in an inclusive, participatory, transparent and innovative way, with a focus on increasing the quality of life and well-being of citizens (Brasil, 2021, art. 2º, I).

Despite bringing an interesting proposal for promoting civil society participation in public affairs, this is not something guaranteed with technological improvement alone. There are many sociocultural factors involved. Morozov & Bria (2019) highlight, for example, the contradictions and disputes in the development and results of urban technology infrastructures. Those notably aligned with neoliberal values, such as the convenient products and services of large technology and innovation companies that dominate the market, such as big techs, like Uber and Google, for example, that make it difficult to experiment with policies and economic measures centered on social responsibility of governments towards their population, in the use of infrastructures developed based on principles of social well-being and the expansion of citizenship rights.

In this scenario, public libraries, in addition to their traditional functions of providing access to books and reading, preserving and disseminating information, socially and digitally including any citizen who seeks them, position themselves as social actors, moving away from the artifact (thing or place where things develop) bias, to become the subject of all information actions that can be coordinated, from informational ones themselves, to educational, cultural and social actions (Luterek, 2020).

“Constructive participation and the development of democracy depend both on a satisfactory education and on free and unlimited access to knowledge, thought, culture and information” (IFLA, 2022, p.1). Therefore, the formation of individuals who are aware of their political and social rights and duties in a democratic space must also be seen as a mission of public library services.

It is known that public libraries, with their adaptive nature, have a strategic and essential role in mediating education and information literacy in the community in which they operate, skills that are more than fundamental for the consolidation of citizenship (Medeiros, 2010); therefore, skills that become elementary in the context of smart cities given the emphasis on the citizen participation, as observed in the literature on that subject.

Reflecting on libraries in territories of technological convergence (smart city), Schöpfel (2018) indicates four dimensions of libraries that play a role in this urban development model: smart services, smart people, smart space and governance.

According to the author, the first dimension (smart services) refers to the application of the spirit of innovation of the smart cities model in the services offered by libraries, using technological innovations in an informational ecosystem focused on the user. The second dimension presented (intelligent people), as already mentioned, concerns the fact that the library user is no longer a passive consumer of information, but a co-producer of knowledge inserted in a community that goes beyond the walls of the library.

Still examining the dimensions of the smart library, Schöpfel (2018) indicates the dimension of the smart space, aiming for a library with sustainable architecture that enables sustainable practices for users. Furthermore, it points to a fourth and final dimension, referring to governance, which encapsulates aspects of social participation in public libraries' daily life by suggesting the participation of users in library decision-making, providing more transparency and collaboration in this ecosystem, which, having a bias more collective, it better develops the singularities of the community in which it operates.

IFLA/UNESCO, through its *Public Library Manifesto* (2022), very clearly meets what the United Nations (UN) Agenda 2030 recommends, encouraging sustainable development through education, culture, inclusion and information. It is worth noting that the Manifesto itself already makes a correlation between the services offered in public libraries, the implementation of the SDGs and the construction of fairer and more sustainable societies. Regarding the guidelines for the institution, IFLA states that they do not constitute a finished product, but that they must be understood as a process in development as technologies and concepts constantly change (Koontz & Gubbin, 2013).

The UN Agenda 2030 is a global pact signed in 2015 by the 193 countries that made up the United Nations Summit on Sustainable Development, being the main reference in the formulation and implementation of public policies in the context of the ongoing neoliberal agenda, where universal structural problems (such as poverty, illiteracy and unemployment) expose the contradictions of this economic model and place the possibilities of achieving "sustainable development" under suspicion. This is an important device in smart city projects developed in Brazil and around the world.

Like many public policies developed in the last decade, in Brazil and around the world, the PNCI is conditioned by guidelines defined in international agreements, such as those signed within the UN. In the domain of this study, the SDGs of the 2030 Agenda, document analyzed in this section, express the ambitious purpose of achieving dignity and quality of life without compromising the environment, and, consequently,

future generations. The Agenda advocates and its 17 SDGs (Figure 1) plan transformative measures towards a more sustainable global direction.

Figure 1: UN Sustainable Development Goals



Source: United Nations Organization Website.

Therefore, libraries, especially public libraries, with their social function, are allies in this political agenda. The information services provided by public libraries must also reflect social changes. In this way, the International Federation of Library Associations and Institutions (IFLA) and the Brazilian Federation of Associations of Librarians, Information Scientists and Institutions (FEBAB) have encouraged the adoption of the objectives of the 2030 Agenda in planning library services (IFLA, 2015; FEBAB, 2018). However, it is known that this is a rhetoric that involves many contradictions, which we seek to explore in this work in order to take ownership of this debate, pointing out the limits and possibilities of including public libraries in these discussions, always thinking of them as social institutions that must act cooperatively with public authorities.

FINDINGS AND DISCUSSION

PUBLIC LIBRARIES' EXPRESSED ROLE IN PNCI

The smart city, with its *smart* quality, promises citizenship and sustainability. However, as Morozov and Bria (2019) indicate, the neoliberal context that frames this urban development model tends towards entrepreneurial and financialized urbanism. Thus, the main point of this mode of urban planning, the sustainable use of the city's resources with a higher quality of life for citizens, ends up losing prominence to an emphasis on intelligent and interactive devices that enable an "inconvenience-free urban experience". There is a lack of connection with real problems. Public libraries have traditionally worked toward a more aware, informed, and, more recently, digitally included community; therefore, it can enhance the creativity and social participation that are so important to this model of urban development.

Although public libraries have a strategic and essential role mediating education and information literacy in the community in which they operate, they appear rarefied throughout the PNCI. The text of the bill mentions actions that circumscribe the activities of public libraries, actions foreseen in its guidelines for the development of the structuring axis "innovative and highly qualified society", such as: "social participation and exercise of citizenship"; "places of co-creation and knowledge exchange"; "continuing education and training programs"; "digital information and education services"; "management of schoolchildren's learning"; "development of creativity and innovation"; "innovation and technologies in education"; "repository with public utility information"; and "training in the use of technological resources" [information literacy], but not directly articulated with the institution. Libraries are only mentioned twice in its thirty pages:

Improvement of learning infrastructure, such as **libraries** and reading rooms (Brasil, 2021, art. 17, I, paragraph c, emphasis added).

Resources for smart city initiatives originated from agreements with the Union can be used to create public workshops for the development and elaboration of innovative products and processes

and, preferably in **public libraries**, multifunctional creation spaces, for the development of curricular activities or extracurricular activities for public school students (Brasil, 2021, art. 18, emphasis added).

The rarefied insertion of management, production and dissemination actions and access to information for the generation of knowledge, in addition to promoting citizenship and social inclusion actions, could be enhanced if the public library, as a social and urban equipment, was adequately triggered in this public policy.

Mersand et al. (2019) indicate that greater participation of local community members in literacy initiatives and learning opportunities increases understanding of civic and legal issues and results in greater economic development, which meets the purpose of the smart cities project. Therefore, reducing the public library to a space for the development of school activities is to underestimate its social function of working within its community. In order to aim at the school public, political and social efforts must be made to implement Law n. 12.244/2010, which provides for the universalization of the school library in Brazil. That law has not yet been successfully implemented and would be another resource to be addressed in debates about the PNCI in the light of Information Science. This approach would provide more support for discussions about digital and information literacy, considering that school is the first place where children and young people come into contact with different forms of literacy.

Legislators could have considered digital and informational literacy actions for the political-social engagement of citizens when drafting a sustainable and technological urban development policy, but this aspect was subsumed under the main idea of the functionalist discourse that surrounds the topic. It is inferred that the absence of representatives of the librarian class in the hearings to debate the Brazilian smart city model (Brasil, 2021b) explains the instrumental look cast on the public library in the construction of the PNCI bill of law. It is worth remembering that the PNCI is what will direct the development of municipal plans for smart cities, therefore, an inadequate function in this context is very harmful for the institution and the community.

That said, for the analysis undertaken in the next section we gathered information actions aligned with the 2030 Agenda, a device that conditions the PNCI regime, carried out in Brazilian public libraries, highlighting their possibilities and limitations.

BRAZILIAN PUBLIC LIBRARIES' INFORMATION ACTIONS ALIGNED WITH THE 2030 AGENDA FOR SUSTAINABLE DEVELOPMENT

Moyses et al. (2019) analyze that, nowadays, the public library plays a fundamental role in social participation and citizen articulation, in addition to being an essential equipment in the cultural life of Brazilian municipalities.

Paying attention to the objectives of this work, we gathered experience reports and/or news about Brazilian public libraries that impact 12 of the 17 Sustainable Development Goals. Information actions were identified in public libraries located in all the five regions of Brazil. Those actions help to achieve 22 of the 169 targets included in the SDGs of the 2030 Agenda.

- 1 - No poverty (2 goals);
- 3 - Good health and well-being (1 goal);
- 4 - Quality education (3 goals);
- 5 - Gender equality (2 goals);
- 8 - Decent work and economic growth (1 goal);
- 9 - Industry, innovation and infrastructure (1 goal);
- 10 - Reduced inequalities (1 goal);
- 11 - Sustainable cities and communities (2 goals);
- 12 - Responsible consumption and production (2 goals);
- 13 - Climate action (1 goal);
- 16 - Peace, justice and strong institutions (3 goals);
- 17 - Partnerships for the goals (3 goals).

Although SDG 11 (sustainable cities and communities) is the central and most obvious objective to be considered when developing a smart city plan, other objectives and their respective targets align with the theme of sustainable urban development, to a greater or lesser extent, in information actions undertaken in public libraries.

In this sense, our survey resulted in the following information actions in Brazilian public libraries: sustainable biased vocational training actions for vulnerable young people, job boards, social assistance actions, information literacy actions, health literacy actions, vocational guidance, instrumental language courses, reading mediation with focus on the SDGs, provision of collections and tools that empower minorities (women, people with disabilities, elderly people, LGBTI+ people, black people and indigenous people), digital literacy workshops aimed at targeted audiences, lectures on inclusive themes, actions for the preservation and dissemination of cultural heritage, promotion of accessible events, ecodesign actions, environmental education activities, environmental preservation actions and hackathons (Recode, [2019]; Consed, 2019; Sergipe, [2024]; BSP, [2023]; Caxias, 2023; CRB-3, 2019; Quintanilha, 2023; Lima *et al.*, 2019; Palhares & Santos, 2022; Silva, 2019; Sapiranga, 2023; Biblioteca Pública Municipal Professor Bruno Enei, 2023; Coelho, 2023; Virada Sustentável, [2023]; Santos, 2021; Aguiar & Oliveira, 2022; Domingos Martins, 2022a; 2022b; Ceará, 2023; FBN, 2023; Mato Grosso do Sul, 2017; 2021; CNM, 2019; Revista Programa, 2022). Considering our objective of discussing the role of the public library based on what was found in the PNCI, we chose not to describe each of the identified actions, but, in fact, to address the possibilities and limitations of the Brazilian context observed in the analysis of these actions, which are listed in the Appendix at the end of this chapter.

The formative, relational and mediation actions undertaken in Brazilian public libraries identified in this study impact in some way on the fulfillment of the SDGs of the 2030 Agenda and are intertwined with the information regime of smart cities, in order to promote access to information and literacy for citizenship through a collaborative and continuous process. The Appendix presents a synthesis of findings in

scientific literature and media outlets, with the aim of arguing, based on the Brazilian reality, about the little explored potential of this institution by the public power in the context under study, indicating actions undertaken in Brazilian public libraries that are related with the objectives of the 2030 Agenda, in which we observed limits and possibilities in mitigating structural problems that require more forceful public policies to be truly resolved. However, we highlight the social role of public library in these scenarios and the importance of their information actions for understanding the complexity of the issues surrounding the smart cities model of urban development. Below are mentioned 2 of the 22 actions raised in this study.

There are approximately 222,000 people living on Brazilian streets (Quintanilha, 2023). The homeless population is made up of a heterogeneous group of individuals in conditions of extreme poverty that are related to the dynamics of the city, the formation of territories and social segregation. This portion of the population has different life stories and motivations and is made invisible, in addition to being considered a nuisance for many. That said, to exemplify an information action that aligns with the goal “[...] to ensure that all men and women, particularly the poor and people in vulnerable situations, have access to social services, basic infrastructure, new technologies and means of production, information and communication technologies, financial services and security in equitable access to land and natural resources.” (IPEA, 2018, p.38), we have the project *Acolhimento*, from São Paulo Library, in the capital of São Paulo. This is an action for the socio-cultural inclusion of citizens, especially homeless people and immigrants. Welcoming and collecting demands consists of dialogue on topics such as feelings, expectations and work. The library has social workers on its team, promoting actions internally or referring them to other municipal services. It carries out humanized listening activities and provides guidance for removing new copies of documents and resolving health, housing and legal issues. Furthermore, they develop reading mediation actions and workshops that integrate this group of people in vulnerable situations (BSP, [2024?]).

It is true that welcoming and understanding the needs (informational and others) of homeless people are ways of slowing down the exclusion of these vulnerable groups, however, the information actions mentioned have limits in the sense of needing other instances of the Public Power, such as the State departments of education, culture, employment and social assistance. The limitations that are found, in the informational sphere, are mainly related to cognitive and technological disparities due to the condition of social invisibility. In the context of technological disparities, to exemplify an information action that collaborates with the goal of “[...] significantly increasing access to information and communication technologies and striving to offer universal and affordable access to the internet by 2020, seeking to guarantee quality, privacy, data protection and cyber security.” (IPEA, 2018, p.242), we highlight the project *A vovó está on!*, carried out at the Public Library Mayor Edwin Kuwer, located in Sapiranga, in Rio Grande do Sul. This is a digital inclusion initiative for seniors, with weekly meetings that aim to introduce the daily functionalities of the smartphone in the routine of this audience (Sapiranga, 2023).

It is important to highlight that a large part of these information actions touch on problems that affect developing countries, such as universalization of education at all levels of education, decent housing, professional qualification, digital literacy and serious environmental problems, such as lack of basic sanitation, selective waste collection, among other issues. These are actions that were or are financed through non-governmental organizations (NGOs), resources from projects or financial incentives by federal law. This situation demonstrates the proactivity of public library librarians in promoting actions on a permanent basis and the urgency of recognition by state and municipal spheres in enabling significant and continuous work towards sustainable development.

The survey of information actions aligned with the 2030 Agenda in the five regions of Brazil and the production of knowledge about sustainable development and public libraries by the associative movement demonstrate that librarians have been proactive and aware of this political agenda. However, legislators and public administrators still show little sensitivity to the issue.

In addition to the positive impact of these practices, actions such as those listed bring the public library closer to the community. It is also worth noting that some actions achieve the SDGs' targets more efficiently than others. In general, it is observed that more assertive and engaged actions on social issues, such as identity and diversity, have an impact on human and sustainable development, such as anti-capacity, anti-racist, anti-misogyny and anti-homophobia causes, mobilized more frequently in periodical awareness campaigns. Public libraries traditionally carry out awareness-raising activities in a more engaged way during the campaign months agreed with the government. The participation of public libraries in awareness campaigns launched by the government is an important opportunity to mediate information, especially when they cover sensitive topics such as those mentioned here.

It is worth highlighting the work of the Brazilian Federation of Associations of Librarians, Information Scientists and Institutions (FEBAB), the largest entity in the librarian association movement in Brazil, which reveals itself as a fundamental social actor in containing the tendency towards the invisibility of the public library, stimulating political, social, cultural and economic incentives at governmental level. This effort can be exemplified by the activity of its working groups, its thematic events and recent publications aimed at promoting dialogue between libraries, State and civil society, such as *Cartilha para Municípios: Biblioteca Viva* (2018) and the advocacy campaign letter *Libraries for a better world: yesterday, today and always* (2021), which aim to underpin the importance of libraries in contemporary times. Theory and practice constantly reinforce that libraries are strategic partners in achieving the SDGs, contextualizing and analyzing the limits and possibilities of their application and adapting them to the reality of their countries.

Brazilian public libraries have been active in promoting actions that explore the contradictions of Brazilian society in a tenuous dimension and, we believe, initially, in a more instrumental direction. An example of that are environmental education actions to inform about and make spaces available for selective waste collection, which is rather a kickstart for engagement, but does not yet constitute an emancipatory action, including

citizens in the political dynamics and production of urban space in a way that is more active and conscious.

However, the importance of public libraries for their communities is undeniable. The indicated macro policies seek to homogenize issues on their agendas, focusing on solutions and hiding the contradictions of current models and discourses. Information actions in public libraries present limitations, but signal possibilities for revealing social conflicts and enabling social participation. Even though planning (establishing goals) is very necessary in public administration, it is by facing conflicts collectively that we will be able to find permanent solutions for sustainable urban development, with a decent quality of life for everyone.

In this chain of events, citizens might be neglected by other social actors in their daily lives to the detriment of focus on governance, infrastructure and technology; and digital segregation ends up increasing as this negligence continues. The smart cities model needs that its policies and indicators really express and guarantee the rights of citizens, otherwise the ideology of sustainability, as a “civilizing” resource for an economic development model that is characterized by being predatory will constitute an illusion.

The development of an information policy for cities based on the use of digital technologies is complex and depends on studies on information flows that will guide the course of actions and strategies to be adopted by Brazilian municipalities. Given this fact, reflecting on the social function of public libraries in this context is urgent and powerful. It is expected, therefore, that the library will be seen, both by the public power and by society, as a centuries-old social institution that houses information artifacts and develops mediation, formative and relational information actions.

CONCLUSION

It is concluded that the urban development model of smart cities, especially in the form of the PNCI (Bill of Law n. 976/2021), develops from an emerging information regime, which highlights structural

challenges of Brazilian society, with accentuated inequalities and power relations, but establishes a more connected and transparent project for citizen participation. Regardless of recognizing the advantages placed by that model, in order to enable social participation, we cannot ignore the limitations of Brazilian society, which faces profound educational problems and challenges that concern information literacy, access to technologies and, mainly, the grasp of rights and duties of the citizen and of the State towards him.

Despite including libraries in the legislative proposal, the PNCI, as written, disregards the importance of the public library as a cultural facility, a setting that encourages creativity and citizen participation in the community. Furthermore, the absence of national associations, such as FEBAB and the Brazilian Association of Education in Information Science (ABECIN), in addition to normative, training and class bodies in the process of preparing the PNCI, demonstrates the lack of awareness in understanding the institution and interest in including libraries and librarians as actors in this policy.

Our results refer to the reductionist and instrumental view reserved for public libraries in the text of the National Policy on Smart Cities and discuss the function of public libraries in the context of Brazilian urban centers based on information actions undertaken by these institutions in favor of sustainable development, based on the 2030 Agenda. It is observed that the SDGs mobilized in these actions are still limited in mitigating structural problems that require public policies to be overcome, for which public libraries, through its professionals and its class entities, must position themselves as a preponderant social actor and persistent mediator together with local governments, doing justice to the political and social role that permeates the know-how of these institutions and that encompass information literacy and critical competence in the use of information in pursuit of development that respects diversity, social context and local culture. Only in this way will the information actions that come to mobilize express their informational value, that is, they will be meaningful to those who get involved in them.

However, within the scope of public policies for smart cities, the recognition of the public library as a social actor and the measurement of the importance of the institution in a community explicitly in strategic plans of all public spheres has limitations due to the lack of understanding of the social, political, cultural and educational aspects that permeate the actions involving this institution. There is still much to discuss about the humanistic dimension of the smart city, as the model's focus still remains on the hard domains of smart cities initiatives. Still, the 2030 Agenda reveals itself as a device with effects on the balance between the hard and soft domains of smart cities and, in a way, is strategic to reinforce the social function of the public library and its nuances in this context.

The work of libraries would certainly be more efficient if it had greater support from public authorities and civil society. Considering our object of study, it would be important for local governments to include public libraries in their smart city plans and adequately recognize the value of these entities as social institutions capable, not only of executing actions, but thinking about them collectively, mobilizing patrons, professionals and governments in the development of public policies. The smart cities model needs the ethical responsibility of highlighting the public library as a space for inclusion and interaction, capable of serving all citizens. Like many developing countries, Brazil lives in a context in which neoliberal policies affect governance, in the sense that market interests are prioritized in detriment of the use and application of technology to solve social problems. Such problems require comprehension of informational content to access social and citizenship rights, but they are not yet prioritized.

These reflections bring to the center of discussions on information policies the issue that, in order to be innovative and creative and fulfill the evident potential in the development of smart cities, Brazilian public libraries still require adequate funding to meet the informational and infrastructural needs of the communities in which they are located. The recognition in law of the public library as a social actor is fundamental for the implementation of the Brazilian policy for smart cities, so that its objectives are in fact congruent with those of the 2030 Agenda, not disregarding, as we have seen, the need to contextualize it to the local reality

so that it is actually meaningful to the population and its surroundings. Hence the emphasis in this study on local strategies, mobilized by governments, including the library in an appropriate and relevant way in their smart city projects.

REFERENCES

Aguiar, N. C., & Oliveira, M. C. (2022). *Sustentabilidade ambiental e informacional em bibliotecas públicas: Práticas desenvolvidas na cidade de Poço Verde, Sergipe*. Anais do Congresso Brasileiro de Biblioteconomia e Documentação. Federação Brasileira de Associações de Bibliotecários, São Paulo. <https://portal.febab.org.br/cbbd2022/article/view/2646/2468>

Biblioteca de São Paulo. (2023). *Serviço Social*. <https://bsp.org.br/servico-social/>

Biblioteca Pública Epiphanio Dória. ([2024]). *Projeto Reciclatec*. https://biblioteca.seduc.se.gov.br/?page_id=21

Biblioteca Pública Estadual do Ceará. (2023, dezembro 6). *Encontro Literatura & Diversidade acontece próximo sábado, dia 09, na Biblioteca Pública*. Notícia. <https://bece.cultura.ce.gov.br/encontro-literatura-diversidade-acontece-proximo-sabado-dia-09-na-biblioteca-publica/>

Biblioteca Pública Municipal Professor Bruno Enei. (2023). *Biblioteca Pública Municipal Professor Bruno Enei*. <https://bibliotecabrunoenei.blogspot.com/>

Câmara dos Deputados (2021). *Cidades inteligentes: Uma abordagem humana e sustentável*. (Série estudos estratégicos, 12). Edições Câmara.

Cance, T. C. A. da M. (2017, setembro 18). Projeto de acessibilidade da Biblioteca Isaias Paim vai a escolas de Aquidauana. *Agência de Notícias do Governo do Estado do Mato Grosso do Sul*. <https://agenciadenoticias.ms.gov.br/projeto-de-acessibilidade-da-biblioteca-isaias-paim-vai-a-escolas-de-aquidauana/>.

Coelho, N. (2023). *Biblioteca Pública recebe pela segunda vez certificação de “Declaração de Cuidados com Acervos Raros”*. Prefeitura de Ouro Preto. <https://ouropreto.mg.gov.br/noticia/3615>

Confederação Nacional de Municípios. (2019, julho 5). *Biblioteca pública de Tomé-Açu (PA) desenvolve projeto para produtores rurais*. CNM. <https://www.cnm.org.br/comunicacao/noticias/biblioteca-publica-de-tome-acu-pa-desenvolve-projeto-para-produtores-rurais>

Conselho Nacional de Secretários de Educação. (2019, maio 9). *Projeto de biblioteca pública de Sergipe é citado como referência para todo o país*. CONSED. <https://www.consed.org.br/noticia/projeto-de-biblioteca-publica-de-sergipe-e-citado-como-referencia-para-todo-o-pais>

Conselho Regional de Biblioteconomia 3a região. (2019, outubro 9). *Biblioteca Pública de Iguatu (CE) é uma das premiadas pela Organização Recode*. CRB3. <https://crb3.org.br/biblioteca-publica-de-iguatu-ce-e-uma-das-premiadas-pela-organizacao-recode/>

Desouza, K. C., & Flanery, T. H. (2013). Designing, planning, and managing resilient cities: a conceptual framework. *Cities*, 35, 89-99.

Federação Brasileira de Associações de Bibliotecários, Cientistas de Informação e Instituições. (2018). *Cartilha para municípios: biblioteca viva: todo município pode ter bibliotecas de qualidade*. FEBAB.

Federação Internacional de Associações e Instituições Bibliotecárias. (2015). *As bibliotecas e a implementação da Agenda 2030 da ONU*. ONU.

Fundação Biblioteca Nacional. (2023). *Biblioteca Euclides da Cunha Convida | Programa Vozes Brasilis: “Combate à Intolerância Religiosa”*. Fundação Biblioteca Nacional. <https://www.gov.br/bn/pt-br/central-de-conteudos/eventos/biblioteca-euclides-da-cunha-convida-programa-vozes-brasilis-combate-a-intolerancia-religiosa>.

Fundação do Trabalho de Mato Grosso do Sul. (2021, fevereiro 22). *Acessibilidade: Estão abertas inscrições para curso de Braille*. FUNTRAB. <https://www.funtrab.ms.gov.br/acessibilidade-estao-abertas-inscricoes-para-curso-de-braille/>

Gil, A. C. (2002). *Como elaborar projetos de pesquisa* (4a ed.). Atlas.

Instituto Brasileiro de Geografia e Estatística. (2023). *População brasileira cresce 6,5% e chega a 203,1 milhões de habitantes, aponta Censo 2022*. IBGE Educa. <https://educa.ibge.gov.br/jovens/materias-especiais/21972-populacao-brasileira-cresce-6-5-e-chega-a-203-1-milhoes-de-habitantes-aponta-censo-2022.html>

Instituto de Pesquisa Econômica Aplicada. (2018). *Agenda 2030: ODS: Metas nacionais dos objetivos de desenvolvimento sustentável*. IPEA.

International Federation of Library Associations and Institutions. (2006). *Manifesto IFLA/UNESCO sobre a internet: diretrizes*. IFLA.

International Federation of Library Associations and Institutions. (2022). *Manifesto da biblioteca pública IFLA/UNESCO 2022*. IFLA.

Komninos, N. (2009). Intelligent cities: towards interactive and global innovation environments. *International Journal of Innovation and Regional Development*, 1(4), 337-355.

Koontz, C., & Gubbin, B. (2013). *Diretrizes da IFLA sobre os serviços da biblioteca pública* (2a ed.). IFLA.

Lemos, A. (2013). Cidades inteligentes. *GV Executivo*, 12(2), 46-49.

Lei n. 12.244 de 24 de maio de 2010. (2010, maio 25). Dispõe sobre a universalização das bibliotecas nas instituições de ensino do País. Presidência da República. <https://www2.camara.leg.br/legin/fed/lei/2010/lei-12244-24-maio-2010-606412-publicacaooriginal-127238-pl.html>

Lima, I. F., França, F. da S., Cavalcante, G. F. F., Silva, T. de F. C., Nunes, C. M., Melo, A. M. D. de M., Francisco, A. A., & Antonacci, D. C. G. (2019). Além dos livros: A biblioteca pública enquanto espaço de inclusão, ação e interação. *Inclusão Social*, 13(1), 84-97.

Luterek, M. (2020). Public libraries: Their role in smart city strategies. *Zagadnienia Informacji Naukowej*, 116(2), 27-44.

Medeiros, A. L. (2010). Bibliotecas e cidadania. *Sinais Sociais*, 4(13).

Mersand, S., Gasco-Hernandez, M., Udoh, E., & Gil-Garcia, J. R. (2019). *Public libraries as anchor institutions in smart communities: Current practices and future development*. Proceedings of the 52nd Hawaii International Conference on System Sciences (3305-3314). University of Hawai‘i at Mānoa, Honolulu.

Morozov, E., & Bria, F. (2019). *A cidade inteligente: Tecnologias urbanas e democracia. Ubu*.

Moyses, M. F., Mont’Alvão, C. R., & Zattar, M. (2019). A biblioteca pública como ambiente de aprendizagem: Casos de makerspaces, learning commons e co-working. *Conhecimento em Ação*, 4(2), 4-22. <https://doi.org/10.47681/rca.v4i2.30981>

Organização das Nações Unidas. (2015). *Transformando nosso mundo: A agenda 2030 para o desenvolvimento sustentável*. Centro de Informação das Nações Unidas para o Brasil.

Palhares, M. C., & Santos, L. H. (2022). A Biblioteca Pública Cora Coralina como espaço para o empoderamento da mulher negra em atendimento aos Objetivos do Desenvolvimento Sustentável. *Revista Brasileira de Biblioteconomia e Documentação*, 18, 1-17.

Prefeitura Municipal de Caxias. (2023, dezembro 7). *Biblioteca Pública Municipal Odylo Costa Filho recebe atividade de prevenção à saúde do homem*. Prefeitura Municipal de Caxias. <https://caxias.ma.gov.br/2023/12/07/biblioteca-publica-municipio-odylo-costa-recebe-atividade-de-prevencao-a-saude-do-homem/>.

Prefeitura Municipal de Domingos Martins. (2022a). *Projeto Biblioteca Sustentável: Jardim Secreto completa 6 anos*. <https://www.domingosmartins.es.gov.br/detalhe-da-materia/info/projeto-biblioteca-sustentavel-jardim-secreto-completa-6-anos/29285>

Prefeitura Municipal de Domingos Martins. (2022b). *Biblioteca Municipal é reconhecida como Centro de Educação Ambiental*. <https://www.domingosmartins.es.gov.br/detalhe-da-materia/info/biblioteca-municipal-e-reconhecida-como-centro-de-educacao-ambiental/29328>.

Projeto de lei no 976/2021. (2021, março 3). Institui a Política Nacional de Cidades Inteligentes (PNCI), com vistas à melhoria da qualidade de vida dos municípios, e dispõe sobre os princípios e diretrizes que a nortearão, os seus objetivos, as ações a serem realizadas, os recursos alocáveis e dá outras providências. Câmara dos Deputados. <https://www.camara.leg.br/proposicoesWeb/fichadetramitacao?idProposicao=2274449&fichaAmigavel=nao#:~:text=PL%20976%2F2021&text=Institui%20a%20Pol%C3%ADtica%20Nacional%20de,aloc%C3%A1veis%20e%20d%C3%A1%20outras%20provid%C3%A3o>

Quintanilha, I. C. (2023). *Entre a margem e o centro: Um panorama das ações das bibliotecas públicas para a população em situação de rua* [Trabalho de Conclusão de Curso]. Universidade Federal Fluminense, Rio de Janeiro.

Recode. ([2019]). *Bibliotecas transformadoras: Novas programações em bibliotecas brasileiras*. Recode.

Reis, T. (2014, novembro 2). Brasil tem uma biblioteca pública para cada 33 mil habitantes. *G1 Educação*. <https://g1.globo.com/educacao/noticia/2014/11/brasil-tem-uma-biblioteca-publica-para-cada-33-mil-habitantes.html>

Revista Programa. (2022, abril 4). Biblioteca Parque Estadual do Rio de Janeiro abre o 1º XBoom – Game Jam Experience nessa terça. *Jornal do Brasil*. <https://www.jb.com.br/cadernob/programa/2022/04/1036759-biblioteca-parque-estadual-do-rio-de-janeiro-abre-o-1-xboom-game-jam-experience-nessa-terca.html>

Rizzon, F., Bertelli, J., Matte, J., Graebin, R. E., & Macke, J. (2017, setembro/dezembro). Smart city: Um conceito em construção. *Revista Metropolitana de Sustentabilidade*, 7(3), 123-142.

Santos, L. (2021, outubro 14). Design sustentável e reciclagem são destaques em exposições abertas na Biblioteca Avertano Rocha. *Agência Belém: De pauta e portas abertas*. <https://agenciabelem.com.br/Noticia/222066/design-sustentavel-e-reciclagem-sao-destaques-em-exposicoes-abertas-na-biblioteca-avertano-rocha>

Prefeitura Municipal de Sapiranga. (2023). *A vovó tá on: Projeto de inclusão digital para terceira idade é sucesso em Sapiranga*. <https://sapiranga.atende.net/cidadao/noticia/a-vovo-ta-on-projeto-de-inclusao-digital-para-terceira-idade-e-sucesso-em-sapiranga>

Schöpfel, J. (2018) Smart libraries. *Infrastructures*, 3(4), 43. <https://doi.org/10.3390/infrastructures3040043>

Silva, F. S. (2019). *A relação entre a Agenda 2030 da ONU e as bibliotecas públicas: Um estudo na Biblioteca Pública Municipal Josué Guimarães* [Trabalho de Conclusão de Curso]. Universidade Federal do Rio Grande do Sul, Porto Alegre.

Virada Sustentável. ([2023]). *Clube de leitura com Djamila Ribeiro*. <https://www.viradasustentavel.org.br/>

Appendix.

Information actions aligned with the SDG of the 2030 Agenda

Target	City	Information action
Goal 1 - No poverty		
1.2	Aracaju-SE	“Reciclatec” - Biblioteca Pública Estadual Epiphanio Dória
1.4	São Paulo-SP	“Hospitality” - Biblioteca de São Paulo
Goal 3 - Good health and well-being		
3.4	Caxias-MA	“Men's health prevention action” - Biblioteca Pública Municipal Odylo Costa Filho
Goal 4 - Quality education		
4.4	Iguatu-CE	“The Library as a Tool for Youth Insertion into the Job Market” - Biblioteca Municipal Dr. Matos Peixoto
4.5	Niterói-RJ	“Portuguese Course for Immigrants and Homeless People” - Biblioteca Parque de Niterói
4.7	João Pessoa-PB	“Beyond Books” - Biblioteca Pública Estadual Juarez da Gama Batista
Goal 5 - Gender equality		
5.1	São Paulo-SP	“Feminist Room” - Biblioteca Pública Cora Coralina
5.2	Seringueiras-RO	“Meetings on violence against women” - Biblioteca Pública Municipal Renan Camilo Vasconcelos

Target	City	Information action
Goal 8 - Decent work and economic growth		
8.3	Porto Alegre-RS	“Job training workshops, job boards, local farmers’ markets” - Biblioteca Pública Municipal Josué Guimarães
Goal 9 - Industry, innovation and infrastructure		
9.c	Sapiranga-RS	“Grandma is on!” - Biblioteca Pública Municipal Prefeito Edwin Kuwer
Goal 10 - Reduced inequalities		
10.2	Ponta Grossa-PR	“BiblioSocial” - Biblioteca Pública Municipal Professor Bruno Enei
Goal 11 - Sustainable cities and communities		
11.4	Ouro Preto-MG	“Preservation and access to cultural heritage policies” - Biblioteca Pública Municipal de Ouro Preto
11.7	São Paulo-SP	“Sustainable Turn” - Biblioteca Villa Lobos
Goal 12 - Responsible consumption and production		
12.5	Belém-PA	“Immersion - creation and ecodesign processes in Spanish Pottery” - Biblioteca Pública Municipal Avertano Rocha
12.8	Poço Verde-SE	“Sustainability and environmental education actions” - Biblioteca Pública Municipal Epifânio Dória
Goal 13 - Climate action		
13.3	Domingos Martins-ES	“Secret Garden” - Biblioteca Municipal Argentina Lopes Tristão
Goal 16 - Peace, justice and strong institutions		
16.1	Fortaleza-CE	“Literature & Diversity Meeting” - Biblioteca Pública Municipal do Ceará
16.10	Rio de Janeiro-RJ	“Vozes brasiliis” - Biblioteca Euclides da Cunha
16.b	Campo Grande-MS	“Accessibility practices” - Biblioteca Pública Estadual Dr. Isaias Paim

Target	City	Information action
Goal 17 - Partnerships for the goals		
17.7	Tomé-Açú-PA	“BiblioAgrorural: sustainable management for small farmers” - Biblioteca Pública Municipal Desembargador Wilson de Jesus Marques da Silva
17.8	Redenção-PA	“Training in IT and web development” - Biblioteca Pública Municipal Wesley Viana de Moura
17.17	Rio de Janeiro-RJ	“1º XBoom – Game Jam Experience” - Biblioteca Parque Estadual do Rio de Janeiro

Permeability of the SDG Book Club in Portuguese Language in public policies towards reading in Brazil and Portugal

Callu Ribeiro Ferreira Pedreira e Andrade Bamberg¹

Juliana Marques Ramos²

Luciane Paula Vital³

Daniella Camara Pizarro⁴

ABSTRACT: The study aims to investigate whether the books of the SDG Book Club in the Portuguese Language have permeability in the public policies toward reading in Brazil and Portugal. It describes the main public policies towards reading in these two countries: the National Reading Plan (PNL), in Portugal, and the National Book and Teaching Material Program (PNLD), in Brazil. It also aims to contextualize the SDG Book Club, a project that aims to use books as tools to stimulate the interaction of children between 6 and 12 years with the concepts of the Sustainable Development Goals (SDGs) of the 2030 Agenda. Regarding the procedures, this research is based on the documental analysis of the Catalogs of the SDG Book Club in Portuguese, the Catalog of the PNL

¹ Federal University of Santa Catarina, Florianópolis, Brazil.
E-mail: callubamberg@gmail.com | ORCID ID: <https://orcid.org/0000-0002-1717-1223>

² Santa Catarina State University, Florianópolis, Brazil.
E-mail: juliana.m.ramos.97@gmail.com | ORCID ID: <https://orcid.org/0009-0007-6931-6571>

³ Federal University of Santa Catarina, Florianópolis, Brazil.
E-mail: luciane.vital@ufsc.br | ORCID ID: <https://orcid.org/0000-0003-2526-227X>

⁴ Santa Catarina State University, Florianópolis, Brazil.
E-mail: daniella.pizarro@udesc.br | ORCID ID: <https://orcid.org/0000-0003-3544-8529>

<https://doi.org/10.36311/2025.978-65-5954-624-4.p447-472>

of Portugal, and the Catalog of PNLD of Brazil. Of the 102 SDG Book Club titles in Portugal's Portuguese, 63 were in the PNL. SDG14 was the most covered with the most titles in the public policy analyzed, with 7 titles. Of the 175 SDG Book Club titles in Brazilian Portuguese, 37 were in the PNLD. SDGs 5 and 10 were the most covered with the most titles in the public policy analyzed, with 7 titles each. The presence of SDG Reading Club books in school bibliographies increases the scope of access to such books, and, consequently, the impact that the SDGs may have on future generations. It is relevant to address the SDG themes through reading with children and young people, since they will be responsible for the future of the planet and will be able to become active citizens in their communities, stimulating and practising actions aimed at global sustainable development.

KEYWORDS: SDG Book Club. Reading Public Policies. 2030 Agenda . Sustainable Development.

INTRODUCTION

The United Nations (UN) 2030 Agenda establishes 17 Sustainable Development Goals (SDGs) to resolve environmental, social, and economic issues at a global level by the year 2030. After the launch of the Agenda in 2015, several institutions around the world demonstrated support for the cause and, among them, the International Federation of Library Associations and Institutions (IFLA). The participation of this institution highlights the social role that libraries can have in society, contributing to achieving objectives for the sustainable development of the planet through projects and activities developed by librarians, together with users of information units.

Since the launch of the 2030 Agenda, new studies on the topic have emerged in the context of Library Science and Information Science and new projects have been created to strengthen the movement, including the SDG Book Club, a project created by the UN, with the support of the International Publishers Association (IPA). The result of the Club is the publication of a list of children's books that address each of the 17 SDGs of the 2030 Agenda. A separate section of the club was created for books in Portuguese. Among the countries that speak the language, Brazil and Portugal were selected, becoming part of the SDG Book Club in Portuguese Language.

In this article, we sought to identify whether the books of the SDG Book Club in Portuguese Language are present in the main public policies towards reading in Brazil and Portugal, as we recognize that such actions enable access to books and promote the democratization of reading, leading to books available to the population. The inclusion of SDG Book Club books in school collections expands the scope of access to these books, thus increasing the potential impact of the Sustainable Development Goals (SDGs) on future generations. Finally, the relevance of addressing the themes of the SDGs through reading among children and young people stands out, since these individuals will be the protagonists of the future of the planet. They have the potential to become active citizens in their communities, stimulating and practicing actions aimed at sustainable development at a global level.

This paper describes the main public policies towards reading in these two countries: the National Reading Plan (PNL), in Portugal, and the National Book and Teaching Material Program (PNLD), in Brazil. It also aims to contextualize the SDG Book Club.

Of the 102 SDG Book Club titles in Portuguese in Portugal, 63 were located in the PNL. SDG14 - Life Below Water was the most covered with the most titles in the public policy analyzed, with 7 titles. Of the 175 SDG Book Club titles in Brazilian Portuguese, 37 were located in the PNLD. SDG5 - Gender Equality and 10 - Reduced Inequalities were the most covered with the most titles in the public policy analyzed, with 7 titles each.

LITERATURE REVIEW

2030 AGENDA

In 2000, leaders representing UN member countries met and established the 8 Millennium Development Goals, which focused on global development at an environmental, economic, and social level.

During the fifteen years after the objectives were established, significant progress was made. According to the United Nations Information

Center for Brazil (2021), poverty has been decreasing worldwide, the number of children attending primary school has increased and child deaths have fallen drastically. Furthermore, access to drinking water was significantly increased and investment targets to combat malaria, AIDS and tuberculosis saved millions of people.

Thus, it was proven that the measures taken after establishing objectives led to real progress in the development of the planet, bringing positive changes to people's lives. However, the objectives were not completely achieved. Therefore, a new agenda was created to continue the SDGs, now with a focus on sustainability: The 2030 Agenda, with 17 objectives for sustainable development, subdivided into 169 goals. The 2030 Agenda was discussed at the UN General Assembly (where member countries and civil society negotiated their contributions) and launched in September 2015 during the Sustainable Development Summit (United Nations, 2015). The Agenda consists of the following objectives:

Figure 1: Sustainable Development Goals



Source: United Nations. (2015). *The 17 goals | sustainable development*. United Nations.
<https://sdgs.un.org/goals>

Once the Agenda was presented, the importance of its objectives can be seen, which cover, in general, social, environmental, and economic issues essential to sustainable development and society's quality of life. The 169 goals contained in the 17 Sustainable Development Goals specify and explain the objectives even better, bringing basis and integrity to them. It is also important to highlight that achieving a goal can positively influence other goals, bringing benefits that connect and strengthen each other. And one of the ways to achieve these goals is through reading, especially in the formation of children and adolescents.

SDG Book Club

Launched in 2019, at the Bologna Children's and Youth Book Fair, the SDG Book Club is a project created by the UN, with the support of the International Association of Publishers (IPA), which aims to "use books as a tool that encourages children between 6 and 12 years old to interact with the principles of the Sustainable Development Goals" (Brazil United Nations, 2021), through the dissemination of a list of books from various parts of the world that address themes linked to the SDGs. Initially, the project only included books written in the official UN languages: Arabic, Chinese, English, French, Russian and Spanish. However, in 2020, the movement began to develop the SDG Book Club in other languages, including Portuguese.

SDG Book Club in Portuguese Language

Among the language-speaking countries, only two were selected to form the SDG Portuguese Language Book Club: Brazil and Portugal (United Nations, 2021). In September 2020, entities from the publishing market from both countries came together to make the project viable (Universidade Federal de Goiás, 2021).

According to the United Nations Brazil (2021), the UN invited the Brazilian Book Chamber (CBL) and the National Children's and Youth Book Foundation (FNLIJ) to develop the project in Brazil. The Brazilian

Federation of Associations of Librarians, Information Scientists and Institutions (FEBAB) also participated in the project, working mainly in preparing the catalog of selected books.

In Portugal, the club's founding partners were the General Directorate of Books, Archives and Libraries (DGLAB), the Portuguese Association of Editors and Booksellers (APEL) and the Portuguese Association of Librarians, Archivists, Information and Documentation Professionals (BAD). The selection of books was carried out by DGLAB (General Directorate of Books, Archives and Libraries, 2020).

Thus, in the 2nd half of 2021, the titles selected to make up the SDG Book Club in Portuguese Language were announced: 175 books from Brazil and 102 books from Portugal.

PUBLIC POLICIES TOWARDS READING

There is no fully recognized definition for the term “public policies”, there are authors who elaborate on its definition: Secchi (2016) and Gasparini (2016). Secchi (2016, p.2, our translation) provides the following definition: “a public policy is a guideline designed to face a public problem”. Gasparini (2016), in an attempt to untangle the issue, points out: “As politics, we will understand the art of governing or deciding the conflicts that characterize social groupings” (Gasparini, 2016, p.19, our translation), while “How public, let us understand what belongs to a people, something related to collectivities” (Gasparini, 2016, p.19, our translation). Based on these definitions, it can be inferred that public policy “would be the intentional government action that aims to meet the needs of the community” (Gasparini, 2016, p.19, our translation).

Studies indicate low reading rates in Brazil and Portugal. Among the Portuguese, more than half do not maintain the habit of reading, 61% did not read any book in the year before the study was carried out (Instituto de Ciências Sociais, 2020). In Brazil, there are around 100 million readers, who make up 52% of the population, between 2015 and 2019 there was a reduction of 4.6 million readers (Instituto Pró Livro, 2020). Such data

reinforce the need for public policies aimed at disseminating books and reading.

BRAZIL's PNLD

Since 1997, the main public policy aimed at encouraging reading, distributing books and teaching support material in Brazil was the PNBE, which had its last distribution of books in 2014, after a gap, in 2017 the program was replaced by the PNLD Literary (Santos & Gonçalves, 2023). A branch of the National Book and Teaching Material Program (PNLD), created from Decree nº 9,099/2017, where all Book Programs were unified.

The PNLD is a public policy implemented by the National Education Development Fund (FNDE) and the Ministry of Education, aimed at evaluating and making didactic, pedagogical and literary books available in a systematic, regular and free manner, being one of the largest distribution programs of books in the world (Brasil, 2018a).

Continuing as a free book distribution program, PNLD Literary was created with the aim of unifying the actions of acquisition and distribution of didactic and literary books, previously carried out individually by PNLD (educational books) and PNBE (literary books), serving children and young students of Basic Education in the public network, on a universal and free basis (Brasil, 2018b).

PNLD Literary provides a guide to books that goes through an evaluation process based on several criteria, such as children's literature should contribute to the development of a taste for reading, stimulating the imagination and expanding knowledge of the world (Brasil, 2018a). Teachers select titles based on the book guide, and the school receives the materials throughout the school year. Annually, PNLD Literary publishes its edition alternately, each year focused on a segment (education level). In PNLD 2018 the Initial Years of Elementary Education (1st to 5th year) were covered, in PNLD 2020 the Final Years of Elementary School (6th to 9th year), in PNLD 2021 High School, and in PNLD 2022 Early Childhood Education.

PORTUGAL'S PNL

The National Reading Plan (PNL) is a public educational policy created in 2006, following the results of Portuguese students in the International Student Assessment Program (PISA), which demonstrated Portugal's persistent delay in reading (Vilar, 2016).

The current PNL is expected to run until 2027, sanctioned by Resolution of the Council of Ministers no. 48-D/2017, and is made up of an inter-ministerial commission, which includes members from the ministries of Education, Culture, Science, Technology and Teaching Superior and Territorial Cohesion, the PNL aims to "implement and develop public reading policies in the area of reader training" as well as "promote the taste, habits and reading skills of the Portuguese population" (Plano Nacional de Leitura, 2017, our translation). The PNL:

has developed diverse and far-reaching work with schools and the community over the last 15 years. With the mission of promoting reading habits and increasing the population's literacy levels, the PNL designs and executes plans, projects, own actions, and actions in partnership with the various stakeholders with responsibility in these areas and supports reading agents from different sectors of society. (Plano Nacional de Leitura, 2023b, our translation).

Its mission aims to enable the Portuguese population to expand reading skills and habits, strengthening their personal, professional, social, and cultural development, becoming "more critical and autonomous citizens, contributing to a culture of civic and democratic demand" (Plano Nacional de Leitura, 2017, our translation).

At the school environment, the PNL has been supporting schools on different fronts: in the provision of books, resources, materials, and training, and also in the execution of initiatives, projects and activities, aimed at mediating and promoting reading at different levels of education.

RESEARCH METHODS AND OBJECTIVES

The research question that guides this study was formulated as follows “what are the books of the SDG Book Club in Portuguese Language listed in the main public policies toward reading in Brazil and Portugal?”

The study aims to investigate whether the books of the SDG Book Club in the Portuguese Language have permeability in the main public policies toward reading in Brazil and Portugal. Therefore, the objective of this study is to identify whether the books of the SDG Book Club in the Portuguese Language are listed in the PNL and PNLD catalogs.

The research was based on the qualitative and quantitative approach. For Prodanov and Freitas (2013, our translation),

qualitative research considers that there is a dynamic relationship between the real world and the subject, that is, an inseparable link between the objective world and the subject's subjectivity that cannot be translated into numbers. [...] Such research is descriptive. Researchers tend to analyze their data inductively. The process and its meaning are the main focus of the approach. (p.70).

According to Alves (2003), quantitative research starts from parameters and is metric, assuming the use of statistics. The research procedures that make it qualitative and quantitative will be characterized below.

Regarding procedures, this is research based on documentary analysis of the SDG Book Club Catalogs in Portuguese, the National Book Plan Catalog (PNL) and the National Book and Teaching Material Program Catalog (PNLD). For Pádua (1997, p.62, our translation), documentary research is that “carried out from documents, contemporary or retrospective, considered scientifically authentic (not fraudulent); it has been widely used in social sciences”.

In the PNL catalog, the Club's titles present in the editions available online were collected (Before 2017, 2017, 2018 1st semester, 2018 2nd semester, 2019 1st semester, 2019 2nd semester, 2020 1st semester, 2020

2nd semester, 2021 1st semester, 2021 2nd semester, 2022 1st semester, 2022 2nd semester, and 2023 1st semester).

In the PNLD catalog, the Club's titles present in editions published since Decree nº 9,099, of July 18, 2017, which unified the acquisition and distribution actions of textbooks and literary books (with the exception of the 2019 edition, in which no literary collection was located). The clippings of the documentary survey were prepared according to the publication characteristics of each public policy edition.

The number of books per SDG was analyzed, within the SDG Book Club in Portuguese Language, making a comparison between the focus of titles from Brazil and Portugal. The SDG Book Club titles present in each policy analyzed were collected, in addition to the name of the author(s), the SDG to which each title belongs, the edition in which the title was included and the age group category indicated. The focus of each public policy in relation to the SDGs to which their titles belong was also analyzed.

FINDINGS

Firstly, we sought to identify the SDGs on which the Portuguese Language Book Club focuses. In other words, we seek to discern which SDGs are most addressed through title suggestions, providing several opportunities to address topics related to the 2030 Agenda with children.

Table 1: Number of titles per SDG

SDG	SDG Book Club in the Portuguese Language - Brazil	SDG Book Club in the Portuguese Language - Portugal
SDG 1 - No Poverty	9	4
SDG 2 - Zero Hunger	2	5
SDG 3 - Good Health and Well Being	8	5

SDG 4 - Quality Education	17	9
SDG 5 - Gender Equality	27	7
SDG 6 - Clean Water and Sanitation	2	7
SDG 7 - Affordable and Clean Energy	2	4
SDG 8 - Decent Work and Economic Growth	4	7
SDG 9 - Industry, Innovation and Infrastructure	2	6
SDG 10 - Reduced Inequalities	20	6
SDG 11 - Sustainable Cities and Communities	15	8
SDG 12 - Responsible Consumption and Production	12	6
SDG 13 - Climate Action	5	5
SDG 14 - Life Below Water	8	8
SDG 15 - Life on Land	23	7
SDG 16 - Peace, Justice and Strong Institutions	18	4
SDG 17 - Partnerships for the Goals	1	4
Total	175	102

The Brazilian edition of the Book Club focused mainly on SDG 5 - Gender Equality, SDG 15 - Life on Land and SDG 10 - Reduced Inequalities, with 27, 23 and 20 titles, respectively. On the other hand, in the Portuguese edition of the Book Club, SDG 4 - Quality Education, SDG 11 - Sustainable Cities and Communities and SDG 14 - Life Below Water stood out, with 9, 8 and 8 titles, respectively.

In relation to the total volume of titles, the Brazilian SDG Portuguese Language Book Club presents a higher number of titles compared to the Portuguese edition, accounting for 175 titles against 102, respectively.

PERMEABILITY OF THE SDG Book CLUB IN PORTUGUESE LANGUAGE IN PUBLIC POLICIES TOWARDS READING IN BRAZIL AND PORTUGAL

Concerning the permeability Of SDG Book Club in Portuguese Language within the main public reading policy in Brazil, of the 175 SDG Book Club titles in Brazilian Portuguese, 37 were in the PNLD. When crossing the titles from the Club's catalog with the PNLD catalogues, the following titles were identified:

Table 2: SDG Book Club titles present in the PNLD.

SDG 1 – NO POVERTY			
Title	Author	Public policy edition	Age group
Da minha janela	Otávio Júnior	PNLD 2022 - Childhood education	Preschool/Mixed
SDG 3 – GOOD HEALTH AND WELL-BEING			
Title	Author	Public policy edition	Age group
O menino que amava o passapreto	Adriano Messias	PNLD 2018 - Early grades of Elementary school	4º and 5º grades
SDG 4 – QUALITY EDUCATION			
Title	Author	Public policy edition	Age group
Os casamentos da dona baratinha	Elma	PNLD 2022 - Childhood education	Preschool/Mixed
Palavras sapecas	Katia Canton	PNLD 2022 - Childhood education	Preschool/Mixed

Direitos do pequeno leitor	Patricia Auerbach	PNLD 2018 - Early grades of Elementary school	1º to 3ª grade
Rosa	Odilon Moraes	PNLD 2020 - Final Years of Elementary School	6º and 7ª grades
SDG 5 – GENDER EQUALITY			
Title	Author	Public policy edition	Age group
Caderno sem rimas da Maria	Lázaro Ramos	PNLD 2018 - Early grades of Elementary school	4º and 5ª grades
Coisa de menina ou coisa de menino?	Pri Ferrari	PNLD 2018 - Early grades of Elementary school	1º to 3ª grade
Pinóquio	Jean Claude R. Alphen	PNLD 2018 - Early grades of Elementary school	1º to 3ª grade
As aventuras de sargento verde	Helena Gomes	PNLD 2020 - Final Years of Elementary School	6º and 7ª grades
Layla, a menina síria	Cassiana Pizaia; Rima Awada; Rosi Vilas Boas	PNLD 2020 - Final Years of Elementary School	6º and 7ª grades
Princesas, bruxas e uma sardinha da brasa: contos de fadas para pensar sobre o papel da mulher	Helena Gomes; Geni Souza	PNLD 2020 - Final Years of Elementary School	6º and 7ª grades
A valentia das personagens secundárias	Stella Maris Rezende	PNLD 2021 – High School	High School - 1º to 3º grade
SDG 7 – AFFORDABLE AND CLEAN ENERGY			
Title	Author	Public policy edition	Age group
No corredor dos cobogós	Paula Fábio	PNLD 2021 – High School	High School - 1º to 3º grade

SDG 8 – DECENT WORK AND ECONOMIC GROWTH			
Title	Author	Public policy edition	Age group
Se os tubarões fossem homens	Bertolt Brecht	PNLD 2020 - Final Years of Elementary School	6º and 7ª grades
SDG 10 – REDUCED INEQUALITIES			
Title	Author	Public policy edition	Age group
Amarelindo	Adriano Messias	PNLD 2022 - Childhood education	Preschool/Mixed
A boca da noite	Criatino Wapichana	PNLD 2018 - Early grades of Elementary school	4º and 5ª grades
A cor de Coraline	Alexandre Rampazo	PNLD 2018 - Early grades of Elementary school	1º to 3ª grade
Gente de cor, cor de gente	Maurício Negro	PNLD 2018 - Early grades of Elementary school	1º to 3ª grade
Macapacarana	Giselda Laporta Nicolelis	PNLD 2020 - Final Years of Elementary School	6º and 7ª grades
As aventuras de sargento verde	Helena Gomes	PNLD 2020 - Final Years of Elementary School	6º and 7ª grades
Layla, a menina síria	Cassiana Pizaia; Rima Awada; Rosi Vilas Boas	PNLD 2020 - Final Years of Elementary School	6º and 7ª grades
Princesas, bruxas e uma sardinha da brasa: contos de fadas para pensar sobre o papel da mulher	Helena Gomes; Geni Souza	PNLD 2020 - Final Years of Elementary School	6º and 7ª grades
A valentia das personagens secundárias	Stella Maris Rezende	PNLD 2021 – High School	High School - 1º to 3º grade

SDG 7 – AFFORDABLE AND CLEAN ENERGY			
Title	Author	Public policy edition	Age group
No corredor dos cobogós	Paula Fábio	PNLD 2021 – High School	High School - 1º to 3º grade
SDG 8 – DECENT WORK AND ECONOMIC GROWTH			
Title	Author	Public policy edition	Age group
Se os tubarões fossem homens	Bertolt Brecht	PNLD 2020 - Final Years of Elementary School	6º and 7ª grades
SDG 10 – REDUCED INEQUALITIES			
Title	Author	Public policy edition	Age group
Amarelindo	Adriano Messias	PNLD 2022 - Childhood education	Preschool/Mixed
A boca da noite	Criatino Wapichana	PNLD 2018 - Early grades of Elementary school	4º and 5ª grades
A cor de Coraline	Alexandre Rampazo	PNLD 2018 - Early grades of Elementary school	1º to 3ª grade
Gente de cor, cor de gente	Maurício Negro	PNLD 2018 - Early grades of Elementary school	1º to 3ª grade
Macapacarana	Giselda Laporta Nicolelis	PNLD 2020 - Final Years of Elementary School	6º and 7ª grades
O Menino Nelson Mandela	Viviana Mazza; Mauricio Negro; Paolo D'Altan; Silvana Cobucci Leite	PNLD 2020 - Final Years of Elementary School	8º and 9ª grades
Um lençol de infinitos fios	Susana Ventura	PNLD 2020 - Final Years of Elementary School	6º and 7ª grades

SDG 11 – SUSTAINABLE CITIES AND COMMUNITIES			
Title	Author	Public policy edition	Age group
O que tem no bairro de Ana?	Ana Cristina Melo	PNLD 2022 - Childhood education	Preschool/Mixed
SDG 12 – RESPONSIBLE CONSUMPTION AND PRODUCTION			
Title	Author	Public policy edition	Age group
Carona	Guilherme Karsten	PNLD 2022 - Childhood education	Preschool/Mixed
Gigi e Napoleão	Cláudia Ramos	PNLD 2018 - Early grades of Elementary school	1º to 3º grade
Terra de cabinha: pequeno inventário da vida de meninos e meninas do Sertão	Gabriela Romeu	PNLD 2020 - Final Years of Elementary School	6º and 7º grades
SDG 13 – CLIMATE ACTION			
Title	Author	Public policy edition	Age group
Cadê os bichos?	Cris Eich	PNLD 2022 - Childhood education	Preschool/Mixed
O amuleto da chuva	Maté	PNLD 2020 - Final Years of Elementary School	6º and 7º grades
SDG 15 – LIFE ON LAND			
Title	Author	Public policy edition	Age group
A alma secreta dos passarinhos	Paulo Venturelli; Elisabeth Teixeira	PNLD 2018 - Early grades of Elementary school	1º to 3º grade
Chove chuva: aprendendo com a natureza - sabedoria popular	Magali Queiroz	PNLD 2018 - Early grades of Elementary school	4º and 5º grades

Poemas da minha terra Tupi	Maté	PNLD 2018 - Early grades of Elementary school	1º to 3º grade
O olho do lobo	Daniel Pennac	PNLD 2020 - Final Years of Elementary School	6º and 7º grades
SDG 16 – PEACE, JUSTICE AND STRONG INSTITUTIONS			
Title	Author	Public policy edition	Age group
Cada um no seu lugar	Denise Rochael	PNLD 2018 - Early grades of Elementary school	1º to 3º grade
Paz	Angela Leitre de Souza	PNLD 2018 - Early grades of Elementary school	1º to 3º grade
Memórias de um adolescente brasileiro na Alemanha nazista	Elisabeth Loibl	PNLD 2020 - Final Years of Elementary School	8º and 9º grades
Você é livre!	Dominique Torrès	PNLD 2020 - Final Years of Elementary School	8º and 9º grades
Lampião e o vovô da vovó na cidade de Mossoró	Marcela Fernandes de Carvalho	PNLD 2021 – High School	High School - 1º to 3º grade

SDGs 5 - Gender Equality and 10 - Reduced Inequalities were the most covered with the most titles in the analyzed public policy, with 7 titles each. Finally, SDGs 2 - Zero Hunger, 6 - Clean Water and Sanitation, 9 - Industry, Innovation And Infrastructure, 14 - Life Below Water, and 17 - Partnerships for the Goals have no titles from the club in the PNLD.

In relation to the age groups most covered in the Club's titles located in the PNLD, the Early Years of Elementary School (1st to 5th year), which serves children aged 6 to 10, had the most titles, with 14 located. The PNLD 2018 document, aimed at this segment, divides its collections between Elementary Education - 1st to 3rd Year, and

Elementary Education - 4th and 5th Year, the first had 10 Club titles located and the second with 4 titles.

Then, the Final Years of Elementary School (6th to 9th year) which serves children aged 11 to 14, with 13 localized titles. The PNLD 2020 document, aimed at this segment, divides its collections between Elementary Education - 6th and 7th year, and Elementary Education - 8th and 9th year, the first had 10 Club titles located and the second with 3 titles.

Early Childhood Education in Brazil is divided between Nursery, for children up to 3 years of age, and Preschool, for children from 4 to 5 years of age. The PNLD 2022 document, aimed at this segment, divides its collections between Daycare I - Babies (0 to 1 year and 6 months) - Daycare II - Very young children (1 year and 7 months to 3 years and 11 months) and Preschool

Young children aged 4 and 5. In addition to offering mixed collections, which can be used by more than one segment. 7 Book Club titles were located for this level of education, all oriented by the PNLD for collections for Pre-School or mixed collections.

For the High School age group, which serves young people between 15 and 17 years old, 3 titles were found.

Concerning the permeability Of SDG Book Club in Portuguese Language within the main public reading policy in Portugal, of the 102 ODS Book Club titles in Portuguese in Portugal, 63 were located in the PNL. When crossing the titles from the Club's catalog with the PNL catalogues, the following titles were identified:

Table 3: SDG Book Club titles present in the PNL.

SDG 1 – NO POVERTY			
Title	Author	Public policy edition	Age group
O Príncipe feliz	Oscar Wilde	Before 2017	Over 18 years old - Fluent

Os Miseráveis	Victor Hugo	Before 2017	12-14 years old - Fluent
As vinhas da ira	John Steinbeck	Before 2017	15-18 years old - Fluent
SDG 2 – ZERO HUNGER			
Title	Author	Public policy edition	Age group
Sopa de pedra	Cas Willing	Before 2017	9-11 years old - Middle
A surpresa de Handa	Eileen Browne	Before 2017	6-8 years old - Initial
Lobo grande e lobo pequeno	Olivier Tallec	Before 2017	3-5 years old - Pre reader
SDG 3 – GOOD HEALTH AND WELL-BEING			
Title	Author	Public policy edition	Age group
Viagem à volta do meu quarto	Xavier de Maistre	Before 2017	15-18 years old - Fluent
A Peste	Albert Camus	Before 2017	15-18 years old - Fluent
SDG 4 – QUALITY EDUCATION			
Title	Author	Public policy edition	Age group
Máquina	Jaime Ferraz	2017	6-8 years old – Initial
A coisa terrível que aconteceu a Barnaby Brocket	John Boyne	Before 2017	12-14 years old - Fluent
Ecologia	Joana Bértholo	2019 2.º Sem.	15-18 years old - Fluent /Over 18 years old - Fluent
SDG 8 – DECENT WORK AND ECONOMIC GROWTH			
Title	Author	Public policy edition	Age group
Os bebés da água: conto de fadas para um bebé terreno	Charles Kingsley	Before 2017	12-14 years old - Fluent
O custo de vida	Deborah Levy	2019 2.º Sem.	Over 18 years old - Fluent

Se isto é um Homem	Primo Levi	Before 2017	15-18 years old - Fluent
Ratos e Homens	John Steinbeck	Before 2017	15-18 years old - Fluent

SDG 9 – INDUSTRY INOVATION AND INFRASTRUCTURE

Title	Author	Public policy edition	Age group
Esteiros	Soeiro Pereira Gomes	2021 2.º Sem.	12-14 years old – Fluent/ 15-18 years old - Fluent /Over 18 years old - Fluent
A construção do mundo	Fábio Monteiro	2018 2.º Sem.	3-5 years old - Pre reader / 6-8 years old Initial
Da Terra à Lua	Júlio Verne	Before 2017	12-14 years old – Fluent
Admirável mundo novo	Aldous Huxley	2022 1.º Sem.	15-18 years old - Fluent /Over 18 years old - Fluent
As cientistas: 52 mulheres intrépidas que mudaram o mundo	Rachel Ignotofsky	2018 2.º Sem.	12-14 years old – Fluent/15-18 years old - Fluent /Over 18 years old - Fluent

SDG 10 – REDUCED INEQUALITIES

Title	Author	Public policy edition	Age group
A ilha	João Gomes de Abreu	Before 2017	9-11 years old - Middle
Os direitos das crianças	Os direitos das crianças	Before 2017	3-5 years old - Pre reader / 6-8 years old – Initial
Meninos de Todas as Cores	Luísa Ducla Soares	Before 2017	3-5 years old - Pre reader
As cartas da prisão de Nelson Mandela	Nelson Mandela	2019 2.º Sem.	Over 18 years old - Fluent

SDG 11 – SUSTAINABLE CITIES AND COMMUNITIES

Title	Author	Public policy edition	Age group
Conta-quilómetros	Madalena Matoso	2017	Over 18 years old - Fluent

A rua dos sinais diferentes	José Fanha	2017	3-5 years old - Pre reader / 6-8 years old – Initial
Greta Thunberg : uma história incrível : está nas nossas mãos salvar o planeta!	Valentina Giannella	2019 2.º Sem.	9-11 years old - Middle / 12-14 years old – Fluent/15-18 years old - Fluent
As cidades invisíveis	Italo Calvino	Before 2017	15-18 years old - Fluent
SDG 12 – RESPONSIBLE CONSUMPTION AND PRODUCTION			
Title	Author	Public policy edition	Age group
Sementes à solta	Fernanda Botelho	Before 2017	3-5 years old - Pre reader
Comprar, comprar, comprar	Luísa Ducla Soares	Before 2017	9-11 years old - Middle
O meu pé de laranja lima	José Mauro de Vasconcelos	Before 2017	12-14 years old – Fluent
O mundo à beira de um ataque de nervos	Matt Haig	2019 2.º Sem.	15-18 years old - Fluent /Over 18 years old - Fluent
Capital	Afonso Cruz	Before 2017	9-11 years old - Middle /12-14 years old – Fluent
A grande fábrica de palavras	Agnès De Lestrade	Before 2017	9-11 years old - Middle
SDG 13 – CLIMATE ACTION			
Title	Author	Public policy edition	Age group
Lá fora: guia para descobrir a natureza	Maria Ana Peixe Dias; Inês Teixeira do Rosário	Before 2017	12-14 years old – Fluent
SDG 14 – LIFE BELOW WATER			
Title	Author	Public policy edition	Age group
Irmã, ouves o azul profundo do mar?	Gilda Nunes Barata	2021 1.º Sem.	6-8 years old – Initial
Plasticus maritimus, uma espécie invasora	Ana Pêgo; Isabel Minhós Martins	2018 2.º Sem.	6-8 years old – Initial /9-11 years old - Middle /12-14 years old – Fluent

Descobri um esconderijo	Maria Teresa Maia Gonzalez	Before 2017	6-8 years old – Initial
Roubar ao mar	Carmen Zita Ferreira	2020 2.º Sem.	6-8 years old – Initial /9-11 years old – Middle
Mar: atividário	Ricardo Henriques	Before 2017	6-8 years old – Initial
Moby Dick	Herman Melville	2018 2.º Sem.	15-18 years old – Fluent /Over 18 years old – Fluent
O dia em que o mar desapareceu	José Fanha	Before 2017	3-5 years old - Pre reader / 6-8 years old – Initial

SDG 15 – LIFE ON LAND

Title	Author	Public policy edition	Age group
Sou o lince - ibérico: o felino mais ameaçado do mundo	Maria João Freitas	2018 1.º Sem.	12-14 years old – Fluent/15-18 years old - Fluent /Over 18 years old – Fluent
O Livro da Tila	Matilde Rosa Araújo	Before 2017	6-8 years old – Initial
O que há neste lugar?: guia de exploração da paisagem	Maria Manuel Pedrosa	2019 2.º Sem.	6-8 years old – Initial /9-11 years old – Middle / 12-14 years old – Fluent

SDG 16 – PEACE, JUSTICE AND STRONG INSTITUTIONS

Title	Author	Public policy edition	Age group
Uma questão de azul escuro	Margarida Fonseca Santos	Before 2017	9-11 years old – Middle
Por favor, não matem a cotorvia	Lee Harper	Before 2017	9-11 years old – Middle
As aventuras de Robin dos Bosques	Roger Lancely Green	2019 1.º Sem.	12-14 years old – Fluent/15-18 years old - Fluent /Over 18 years old – Fluent

SDG 17 – PARTNERSHIPS FOR THE GOALS

Title	Author	Public policy edition	Age group
Cem sementes que voaram	Isabel Minhós Martins	2018 1.º Sem.	3-5 years old - Pre reader / 6-8 years old – Initial

SDG14 - Life Below Water was the most covered with the most titles in the public policy analyzed, with 7 titles. The SDGs least covered were SDG13 – Climate Action and SDG17 – Partnerships for the goals, both with 1 title each.

Among the Club's 63 books found in the PNL, 14 are recommended for pre-readers (children aged 3 to 5) and 21 for children aged 6 to 11, an age group determined as the target audience for the titles of SDG Book Club. The rest of the titles found are recommended for fluent readers aged 12 to 18 (23 titles) and over 18 years of age (5 titles).

In relation to the period in which they were included in the PNL, more than half of the 63 books (35) were included in the "Before 2017" editions. From 2017 to 2019, 21 Club titles were included in the PNL. From 2020 to 2022, 7 titles were included.

DISCUSSION

Although the list of the Brazilian SDG Book Club in Portuguese Language presents more titles than the Portuguese edition (175 titles and 102 titles, respectively), fewer Club titles were located in Brazilian public policy than in Portuguese public policy.

It is observed that the criterion of indicating the age range of 6 to 12 years was not followed for a considerable part of the titles selected by Portugal to compose the SDG Book Club in Portuguese Language. According to the General Directorate of Books, Archives and Libraries (2020), this difference in relation to the age group is due to the participation of the Portuguese Association of Librarians, Archivists, Information and Documentation Professionals (BAD) in the selection of the Club's works which, "in addition to the UN SDG Book Club, it expanded the scope of the action and also selected works aimed at an adult audience, thus enhancing the original initiative."

The PNLD's education level indications are in line with the age group that the Club seeks to reach, focusing mainly on Elementary Education, with 27 of the 37 titles raised.

Furthermore, Portugal's PNL demonstrates that it is in compliance with the SDGs, despite not mentioning the SDG Book Club, it released a document that confirms its concern with the cause of the SDGs. Simultaneously with the development of this work, the project "Books PNL2027 and the SDGs" was published on the PNL page, with the aim of presenting "a broad set of reading suggestions to learn about each of the seventeen objectives and as a motto for reflection on the same." (Plano Nacional de Leitura, 2023a).

The PNL focuses mainly on the SDG related to Life Below Water, while the PNLD covers focuses mainly on the SDG related to Gender Equality. Furthermore, we underline that the PNL presents titles from all of the Book Club's SDGs, while the PNLD covers 12 of the 17 SDGs. In this way, the principles of the SDGs that the Book Club seeks to disseminate are mostly included in the main public policies in Brazil and Portugal.

The main limitation of the research was the scarcity of previous studies on the subject, which could contribute to an in-depth literature review.

CONCLUSION

We emphasize that the presence of these titles in public policies is an initiative of the institutions that govern them and is not linked to the SDG Book Club.

The titles selected for the SDG Book Club were released in 2021 and most of the titles raised in public policies were included before this date. However, from now on, it would be interesting to have a dialogue between the institutions responsible for the Book Club and those responsible for developing public policies toward reading, to encourage children's interaction with the principles of the SDGs through reading.

The present study achieved the proposed objectives, however, the development of new studies on the topic is suggested, since the SDG Book Club can be a tool with the potential to stimulate the search for sustainability from a young age. As suggestions for possible themes, we

point to the analysis of the works of each SDG and the PNL document that suggests titles to work on the objectives of sustainable development.

Finally, the presence of SDG Book Club books in schools' bibliographical references, increasing the scope of access to such books, and consequently increasing the impact that the SDG may have on future generations. It is relevant to address SDG themes through reading with children and young people, since they will be responsible for the future of the planet and will be able to become active citizens in their communities, stimulating and practicing actions aimed at global sustainable development.

REFERENCES

Alves, M. (2003). *Como escrever teses e monografias: Um roteiro passo a passo*. Campus.

Brasil. (2018a). *PNLD 2018 - Literário: Apresentação - guia digital*. Ministério da Educação. Secretaria de Educação Básica. Fundo Nacional de Desenvolvimento da Educação. https://www.fnde.gov.br/phocadownload/programas/Livro_Didatico_PNLD/Guias/Guias_PNL_D_2018/Guia_PNLD_Literario_2018.pdf

Brasil. (2018b). *PNLD 2019: Apresentação - guia de livros didáticos*. Ministério da Educação. Secretaria de Educação Básica. Fundo Nacional de Desenvolvimento da Educação. https://pnld.nees.ufal.br/assets-pnld/guias/Guia_pnld_2019_Apresentacao.pdf

Brazil United Nations. (2021). *Clube de Leitura da ONU seleciona 175 livros infantis brasileiros*. <https://brasil.un.org/pt-br/131791-clube-de-leitura-da-onu-seleciona-175-livros-infantis-brasileiros>

Gasparini, E. (2016). Políticas públicas e intencionalidade. In A. Chrispino, *Introdução ao estudo das políticas públicas: Uma visão interdisciplinar e contextualizada* (pp.15-29). FGV Editora.

General Directorate of Books, Archives and Libraries. (2020). *Clube de Leitura ODS*. Portal das Bibliotecas da Direção-Geral do Livro, dos Arquivos e das Bibliotecas. http://bibliotecas.dglab.gov.pt/pt/noticias/Pginas%20de%20Arquivo/Clube-de-Leitura_ODS.aspx

Instituto de Ciências Sociais. (2020). *Inquérito às práticas culturais dos portugueses 2020: Síntese dos resultados*. (J. M. Pais, P. Magalhães, & M. L. Antunes, Ed.). https://www.ics.ulisboa.pt/sites/ics.ulisboa.pt/files/2022/inquerito_praticas_culturais_2020.pdf

Instituto Pró Livro. (2020). *Retratos da leitura no Brasil* (5th ed.). IBOPE Inteligência. https://www.prolivro.org.br/wp-content/uploads/2020/12/5a_edicao_Retratos_da_Litura-_IPL_dez2020-compactado.pdf

Pádua, E. M. M. (1997). *Metodologia da pesquisa: Abordagem teórico-prática*. Papirus.

Plano Nacional de Leitura. (2023a). *Livros PNL2027 e os ODS: Livros PNL para trabalhar os objetivos do desenvolvimento sustentável*. https://www.pnl2027.gov.pt/np4/livrospnl?cat_livrospnl=livrospnlods

Plano Nacional de Leitura. (2017). *Quem Somos: Uma nova etapa do PNL para 2017-2027 (PNL 2027)*. https://www.pnl2027.gov.pt/np4/quemsomos.html?cat_quemsomos=quemsomos

Plano Nacional de Leitura. (2023b). *Plano de Atividades 2023-2024*. https://www.pnl2027.gov.pt/np4EN/file/8/Plano_de_Atividades_Acao_PNL_2023_2024.pdf

Prodanov, C. C., & Freitas, E. C. (2013). *Metodologia do trabalho científico: Métodos e técnicas de pesquisa e do trabalho acadêmico*. Feevale. <https://www.feevale.br/Comum/mídias/0163c988-1f5d-496f-b118-a6e009a7a2f9/Ebook%20Metodologia%20do%20Trabalho%20Científico.pdf>.

Santos, B. B. L., & Gonçalves, L. S. (2023). Panoramas e políticas públicas de leitura no Brasil: avanços e retrocessos. *Revista Crioula*, 31, 288-309. Dossiê. <https://www.revistas.usp.br/crioula/article/view/208707/201356>

Secchi, L. (2016). *Análise de políticas públicas: Diagnóstico de problemas, recomendação de soluções*. Cengage Learning.

United Nations. (2015). *Transforming our World: The 2030 Agenda for Sustainable Development*. <https://sdgs.un.org/sites/default/files/publications/21252030%20Agenda%20for%20Sustainable%20Development%20web.pdf>

United Nations. (2021). *Hundreds of Portuguese and Brazilian children's books highlight sustainability and equality through new SDG Book Club*. Sustainable Development Goals. <https://www.un.org/sustainabledevelopment/blog/2021/06/hundreds-of-portuguese-and-brazilian-childrens-books-highlight-sustainability-and-equality-through-new-sdg-book-club/>

United Nations Information Center for Brazil. (2021). *Momento de ação global para as pessoas e o planeta*. UNIC Rio de Janeiro. <https://unicrio.org.br/pos2015/>

Universidade Federal de Goiás. (2021). *Clube de Leitura ODS em Língua Portuguesa, voltados para crianças, da ONU*. Faculdade de Informação e Comunicação. <https://fic.ufg.br/n/142770-clube-de-leitura-ods-em-lingua-portuguesa-voltados-para-criancas-da-onu>

Vilar, M. I. G. M. V. (2016). *O Plano Nacional de Leitura: Fundamentos e resultados*. [Doctoral dissertation, Universidade Nova de Lisboa]. <https://run.unl.pt/bitstream/10362/18465/1/Tese%20M.%20Isabel%20Vilar.pdf>

Part V

**Knowledge organization to
support sustainability**

Knowledge Organization and Sustainability in Brazilian Information Science: from bibliographic systems to systematic reviews on innovation in environmental contexts

*Graciane Silva Bruzinga Borges*¹

*Gercina Ângela de Lima*²

*Gustavo Silva Saldanha*³

ABSTRACT: Systematic Literature Reviews consist of explicit and reproducible procedures for identifying, selecting, and evaluating rigorous scientific research. These procedures intend to collect and analyze data from original studies to answer specific questions and promote evidence-based practice. From the construction of bibliographic systems to the systematic classification and extraction of knowledge from bibliographic production, methods under construction in Modernity reveal analysis patterns and inferences about the reality of evidence manifested in recorded knowledge. This study will focus on

¹ Federal University of Minas Gerais (UFMG), Belo Horizonte, Brazil.

E-mail: address: gracianebruzinga@gmail.com | ORCID ID: <https://orcid.org/0000-0002-6677-9702>

² Federal University of Minas Gerais (UFMG), Belo Horizonte, Brazil.

E-mail: address: glima@eci.ufmg.br | ORCID ID: <https://orcid.org/0000-0003-0735-3856>

³ Brazilian Institute of Information in Science and Technology (Ibict) / Federal University of the State of Rio de Janeiro (Unirio), Rio de Janeiro, Brazil.

E-mail: address: gustavosaldanha@ibict.br | ORCID ID: <https://orcid.org/0000-0002-7679-8552>

<https://doi.org/10.36311/2025.978-65-5954-624-4.p475-502>

implementation of Systematic Literature Reviews as a permanent process for monitoring Information Science production in Brazil aligned with the United Nations' Sustainable Development Goals. The ongoing reviews are part of an Information Prospection and Innovation Study entitled "Bibliographic Cartographies via Systematic Literature Review". The adopted method is based on Structured Bibliographic Research and consists of 14 stages distributed in four sequential modules. Preliminary findings correspond to the implementation of eight systematic reviews in early stages, divided into four themes: (1) information innovation, (2) data analysis innovation, (3) data visualization, and (4) terminology translation for the dissemination of specialized knowledge. Establishing systematic reviews as a continuous study model aims to answer specific questions using original data from the scientific literature of Brazilian Information Science within the context of sustainability.

KEYWORDS: Systematic Literature Review; Brazilian Information Science; Sustainable Development Goals.

INTRODUCTION

The review process of what has been said and recorded relies on the assumption that every scientific research project includes accessing, analyzing, and retrospectively interpreting the findings of other studies conducted about the topic of interest. From the philosophical and exegetical tradition of Christianity to the empirical science weaved throughout modern times, recognizing the previous structure is a unit that delineates rationality. From the construction of bibliographic systems to the systematic classification and extraction of knowledge from bibliographic production, methods under construction in Modernity are identified regarding analysis patterns and inferences about the reality of the evidence manifested in recorded knowledge. This methodological stage is known a Literature Review. A *Systematic* Literature Review, in turn, consists of a specific method for carrying out a literature review on, of, and for the scientific knowledge produced.

A Systematic Literature Review is a secondary study that can help eliminate potential discrepancies between original studies, visualize identities and likelihoods, understand contradictions, clarify definitions, delineate authorial traditions and epistemological currents, and promote *the empirical* nature of consolidated scientific findings. To foster professional

practice and evidence-based decision-making, systematic reviews enable the analysis and use of quality information focused on accuracy and the annulment of distorting assumptions not based on scientific rigor and evaluation structures.

Based on the historical relationship between bibliography systems and the systematics of literature review via bibliographic sources, the purpose of this article is to present the findings of a methodological proposal called “Systematic Literature Review based on Structured Bibliographic Research” (Borges, 2020) for carrying out a major Information Prospection and Innovation Study entitled “Bibliographic Cartographies via Systematic Literature Review” comprising eight systematic reviews. The research topics covered by the SLRs are geared toward sustainability in the face of unplanned industrial development in the most diverse forms of production throughout modern times from the Knowledge Organization’s (KO) point of view.

This study is part of the project “Articulation and Communication in Science and Technology (S&T): subproject 01 - Research”, linked to the Brazilian Institute of Information in Science and Technology (IBICT)⁴. Its objectives include the development of prospect research strategically related to information, innovation, and sustainability.

The subproject started in Brazil in May 2022 and is mainly guided by the 2030 Agenda of the United Nations (UN), broken down into the Sustainable Development Goals. This research covers two stages. The first, which ended in 2023, focused on designing the empirical and methodological field in the implementation test of the first systematic review. The second phase, which will be completed in December 2024, comprises the period of development and dissemination of the findings that have been analyzed and interpreted in the other reviews that are under development. In this context, the purpose of this communication is to share details of the process of implementing the proposed full reviews. The focus of the report is on the institutional process itself, not on the qualitative

⁴ Project funded by the Ministry of Science, Technology and Innovation (MCTI) of the Brazilian Federal Government and supported by the Research Development Foundation (Fundep).

and quantitative results of the reviews, since, as already mentioned, the research is still ongoing.

THEORETICAL REFERENCE

A PRACTICE BASED ON SCIENTIFIC EVIDENCE

Gabriel Peignot's exercise in understanding the sciences based on the classification gesture of "systems" integrates the Condillacian influence in understanding scientific development and its forms of "systematization" against an erudite or baroque encyclopedism. Analytically, the standpoint of Etienne Bonnot de Condillac ([1749] 1991) in his 1749 work *Traité des systèmes* represents the infrastructure, structure, and application of a system.

The search for "systematization" lies in analyzing different systems to pursue the empirically verifiable truth and improve science. In Condillacian scientific systematology, which has significantly influenced modern *empiricism*, there is no science or art in which systems cannot be developed (Condillac, [1749] 1991). Condillac's concept of system in its meaning and potential applications in modern times will have repercussions in the so-called hard sciences, such as Chemistry, with Lavoisier.

We find here, in this systematization exercise, principles of understanding the production, organization and analytical use of literature. Here we can find theoretical and methodological bases on the "evidence" from the system of bibliographic sources, as well as the construction of methods of reviewing published knowledge. Furthermore, we can state that the map of sciences allows us to identify the first contexts of understanding about the emergence of environmental domains, of the themes that address the universe of knowledge about ecology.

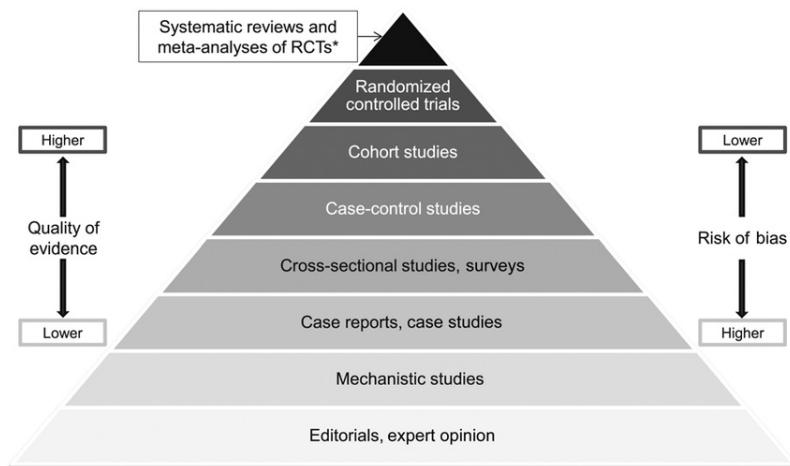
Between the deductive totality of a discourse and its prior organization and the empirical response, the concept of "system" is central to the formation of *epistemes*, from Antiquity, as a metaphysical philosophical form, to the scientificity of Modernity, as in the Condillacian approach.

Therefore, in both circumstances, the “system” represents a totality or an organized whole, the principle for a rational understanding of reality (Abbagnano, 2007). At the “high point” of modern science consolidation, in the 18th century, the concept already had a well-established direction on the relationship between deduction and induction, prior systemic ordering via the question under investigation, and an understanding of the world systems. Faced with the co-constitution of science and its forms of documentation, in other words, the inseparability of modern science and its relationship with recorded data, the concept of system, between deduction and induction in the language territory becomes part of the very definition of scientificity, between rationality and documented empirical evidence, where the concept of “evidence” is inserted.

Evidence-based practice originated in the early 1970s with Archie Cochrane’s research on the effectiveness and efficiency of healthcare services. Cochrane was the first to clearly define the importance of randomized clinical trials to assess the efficacy of treatments (Centro Cochrane do Brasil, 1999). The high pace of knowledge production in this field has made it increasingly difficult to understand a mass of documentary evidence that is often contradictory (Ohlsson, 1994). In the late 1990s, several critics argued that the preparation of reviews from secondary sources depended on idiosyncratic implications, methods of data collection, and data interpretation. In addition to this gap, publications at the time warned that practice based on low-quality reviews of the literature sometimes led to inappropriate recommendations (Cook et al., 1997; Greenhalgh, 1997; Cook et al., 1997; Tranfield et al., 2003).

Systematic reviews tend to be applied to and emanate from fields and disciplines that privilege a positivist tradition, attempting to do for research synthesis what randomized clinical trials attempt to do for isolated studies, that is, a series of techniques to minimize bias and error (Macdonald, 1999). The hierarchy of evidence chart, widely used in the health literature, shows that systematic reviews, with or without a meta-analysis, are the highest quality source of information (FIG. 1).

Figure 1: The Hierarchy of Evidence Pyramid



Source: (Yetley et al., 2016).

Scientific knowledge is relevant to decision-making in professional practice and public policy development. Communities oriented toward producing scientific knowledge are responsible for bringing science's praxis closer to professional performance in the public and private spheres to enable evidence-based practice. This goal is achieved through systematic or integrative reviews (Sampaio and Sabadini 2014).

In the 1990s and early 2000s, medical science made significant progress in terms of literature review quality, conducting research in a systematic, transparent, and reproducible way in the context of social assistance and healthcare (Cook, Greengold, Ellrodt, and Weingarten 1997) (Cook, Mulrow, and Haynes 1997) (Wolf, Shea, and Albanese 2001).

A timeline of systematic reviews and scientific methods begins with Descartes (1596-1650), who emphasized "careful revisions" in his 1637 work *Discourse on the Method*. In 1747, James Lind published an essay on the effects of vitamin C for scurvy treatment. After that, in 1929, Colebrook studied clinical trials in physical therapy, focusing on ultraviolet irradiation, followed by Doull et al. in 1931, examining its effects on children with respiratory diseases. Archibald Cochrane's 1972

publication on Randomized Clinical Trials is a key milestone, and in 1975, Kolind-Sorensen published the first systematic review in physical therapy (Cardoso, 2010).

FROM BIBLIOGRAPHIC SYSTEMS TO THE SYSTEMATIC REVIEW OF DATA BIBLIOGRAPHIC SOURCES AS A METHOD

Literature Review is the research procedure that sustains and drives the advancement of science, as it originates in the historical, consolidated, and retrospective documentation of a given universe of publications, schools of thought, institutions, and authors. Among the different ways of carrying out a review, the Systematic Review offers researchers greater control of the process and more consistent results (Borges, 2020). Systematic Literature Reviews supports scientific communication as a method, ensuring consistency and validating generated knowledge. The goal of operational procedures is to give access to information, including hands-on search activities and the selection of original research.

Considered synonymous with 'systematic overview,' in its initial step, Systematic Review corresponds to the review of a formulated question. This review uses methods to identify, select, and evaluate relevant research and collect and analyze data from the included studies. Statistical methods (meta-analysis) may or may not be used to analyze and summarize the findings of the studies (Glossary, 2019).

The systematic method seeks to minimize errors and present reliable results for decision-making. It has the following characteristics: (1) seeks a clear definition of the objectives; (2) is a method free from bias; (3) involves a broad search of databases; (4) is a careful assessment and validity of the study findings; and (5) is a detailed presentation of the synthesis of the findings (Cardoso, 2010, p.5-6). This process intends to minimize bias through exhaustive literature research, providing an audit trail of the reviewers' decisions, procedures, and conclusions (Cook et al., 1997).

Historically, in the epistemic territory of IS formation, it is possible to identify the roots of systematic review practices in the bibliographic

context, based on the construction of bibliography as a science. The assumptions made concerning systematic reviews application and formalization in health sciences can be found in the bibliographic tradition during the development of Modernity in the 16th, 17th, and 18th centuries, namely, recognizing retrospective production as a criterion of scientificity, systematizing the data published based on surveys and classifications; and creating mechanisms for visualizing data through flowcharts.

Another aspect linked to the history of the bibliographic tradition in how it systematizes scientific sources found in publications during the development of modern science is the conjugation of the concept of “system.” In the 18th century, the concept had been already adopted in Gabriel Peignot’s bibliographic theory. The “question of the knowledge system” and of the means of “systematization” (relating to the scientific methods) is present in the first scientific journals and have been recognized, for example, since Gabriel Peignot’s work.” “Bibliographic systems” as ways of organizing knowledge, presupposing the identification and reusability of classes for retrieving scientific production, are the most extensive concept presented in 1802 by the French bibliographer (Saldanha & Silva, 2017).

The main characteristic of a systematic review is that a well-defined research question drives it. In addition, a critical analysis of the bibliographic portfolio selected during the process intends to answer this question directly (Castro, 2001). The review question should be simple and focused to ensure the rational thread of the study search and selection methods.

The eligibility criteria must be defined with the highest rigor to select studies that can either confirm the initial assumptions of the review or refute them. These criteria are designed to prevent the selection of biased research (Castro, 2001). The result of a systematic review should generate innovative knowledge from evidence that has been previously developed, published, and equally recognized in the scientific innovation system.

Applied to the environmental universe, that is, to the focus on climate change and sustainability, the rigor of the eligibility criteria and the scope of scientific evidence via systematic review allow us to design political

and social contributions for the context of sustainable development. By combining systematical models of bibliography methods (which anticipated maps of science) and systematic analysis of scientific literature, we can establish rigorous standards and sources for understanding environmental challenges. We can also structure guidelines for decision-making in public policies for sustainable development, including evidences resulting from scientific research in domains dedicated to studying the impacts of human actions on the environment.

THE UN SUSTAINABLE DEVELOPMENT GOALS

Based on the social dilemmas of the late 20th century, reproducing the long process of capital exploitation and intensified forms of inequality, comprehending the environmental concept encourages a debate on the relationship between society and nature. Issues such as poverty, hunger, violence, and no access to healthcare and education have become inseparable from the conditions under which communities and territories interact. Sociological macro-categories, such as work and justice, are directly linked to environmental structures such as water and soil. Peace and socio-economic development, focused on reducing inequalities, are conditional to a debate about preserving life in water and on land. Changes in forms of production and consumption are intertwined with clean energy and clean industrial innovation, aimed at preventing the extermination of populations and the extinction of mineral, animal, and plant resources.

Changes in the relationship between human beings and nature in modern times make up the studies on the Anthropocene, the “era” of the direct impact of human action on every environment in which humans interact. The broad debate surrounds the complete domination of the activities undertaken by societies over the conditions of nature’s existence, having modern science as its basis. As Nhacuongue (2022) points out, the scientific development of Modernity is the basis for the beginning of the Anthropocene. It is associated with economic rationality, establishing a framework for the means and practices of production, technological standards, and the ideological apparatuses of the government. In

contemporary times, a different type of rationality, the environmental one, will consider different development perspectives in which ethical principles and critiques of epistemic relations seek to harmonize relations within the universe.

When discussing the “social” aspect of environmental policies, Acselrad (2022) points to a “rupture in the behavior patterns of climate variables, opening up a debate on how the various forms of space occupation interact with each other.” In other words, “spatial practices of appropriating the matter and energy - and climatic processes.” (p.3).

In this context, from the post-World War II era to the United Nations Conference on Environment and Development, known as Eco-92, held in Rio de Janeiro, Brazil, in 1992, the United Nations (UN) made progress in aspects that linked its own foundation to the demands of socio-economic and geopolitical transformations, centrally from the economically most robust countries, throughout the second half of the 20th century. The UN’s original fundamentals, such as keeping the peace, international security, human rights, and humanitarian assistance, have become more closely associated with the environmental and sustainability debate (Organização das Nações Unidas, 2024).

Since Eco-92, promoting peace and international security, for example, has been directly linked to protecting life globally. The 21st century is, therefore, marked by a deepening process of environmental issues as social issues and of social issues as structurally ecological issues.

This scenario has led the UN policy (Organização das Nações Unidas, 2024) to seek proposals from its member countries to implement international pacts for life preservation. Created in the 2010s, the 2030 Agenda is one of the major initiatives of this movement and lists global Sustainable Development Goals, also known as SDG. Altogether, 17 goals and 169 targets have been established. The 17 SDG are:

1. No poverty;
2. Zero hunger and sustainable agriculture;
3. Good health and well-being;

4. Quality Education;
5. Gender equality;
6. Clean water and sanitation;
7. Affordable and clean energy;
8. Decent work and economic growth;
9. Industry, innovation, and infrastructure;
10. Reduced inequalities;
11. Sustainable cities and communities;
12. Responsible consumption and production;
13. Climate action;
14. Life below water;
15. Life on land;
16. Peace, justice, and strong institutions;
17. Partnerships for the goals (Organização das Nações Unidas, 2024).

According to the UN (2024), the 17 goals are integrated and indivisible, i.e., they are based on a balanced relationship between the macro-dimensions of sustainable development: the economic, social, and environmental dimensions. As part of the reflection proposed herein, through the scientific literature, Systematic Literature Reviews seek solutions to prevent the extermination and extinction of the biological conditions required for life to thrive in a context in which science fights, or is used in the battle, to preserve life.

RESEARCH METHODS AND OBJECTIVES

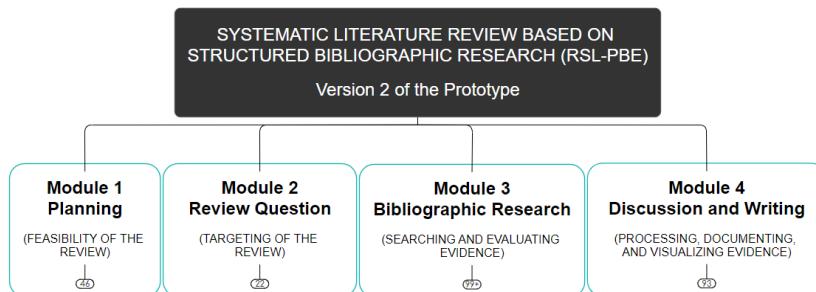
METHODS

To implement the Systematic Literature Reviews, the second version of the methodological proposal called Systematic Literature Review

based on Structured Bibliographic Research, was used⁵. The proposal is characterized by its practical nature and by a descriptive type of research and comprises a methodological path of systematic review 'without' a meta-analysis. In addition, the studies will be selected in a specific way, using carefully defined filtering steps (Borges, 2020).

The procedural modeling of the Systematic Literature Review based on Structured Bibliographic Research was conceived as follows: the 'modules' refer to the macro-processes, made up of sets of sequential stages; the 'stages' are the specific activities directly associated with the modules; the 'steps' correspond to subsets of actions to be executed to complete the activities. This proposal advocates a 'structured' Systematic Literature Review that aligns with the precepts of controlled, verifiable, updatable, and reproducible bibliographic research (Borges, 2020). An overview of the first layer of the method is shown in Figure 2.

Figure 2: Overview of the method Systematic Literature Review based on Structured Bibliographic Research



Source: (Borges 2020).

MODULE 1 - PLANNING

Careful planning is necessary to ensure the *feasibility of the scientific evidence* generated in the systematic review. Module 1 consists of five steps:

⁵ The method was developed as part of a doctoral research project developed in Brazil by the Graduate Program in Knowledge Management and Organization (PPGGOC) at the Federal University of Minas Gerais (UFMG), from 2015 to 2020.

(1) definition of the objectives: in this step, the process begins with preliminary research on the topic of interest, followed by consultations with professors and researchers to discuss initial intentions. After these discussions, the scope of the review is developed and reviewed with the research supervisor or mentor. Finally, the objectives of the review are formulated;

(2) evaluation of the needs: this step involves searching for previous systematic reviews on the same or similar topics to assess whether the new review is necessary. Consulting a specialized library to gather information is crucial. Based on the results, the decision is made whether or not to proceed with the review;

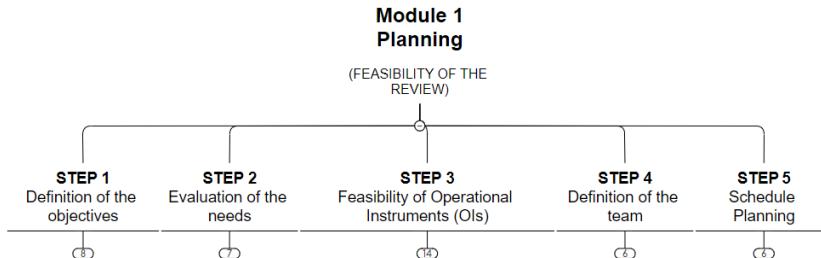
(3) feasibility of Operational Instruments: at this point, the systematic review protocol is prepared, followed by the development of key tools such as a bibliographic portfolio composition table, a systematic review flowchart, and data recording forms. Additionally, tools for managing bibliographic data and visualizing information are selected to ensure efficient data handling and interpretation throughout the review process;

(4) definition of the team: the process of forming the research team begins with identifying individuals capable of contributing to the review. The proposed team is then discussed and validated with the supervisor or mentor, ensuring alignment with the project's needs. A competency matrix is also prepared to clarify the roles and responsibilities within the team;

(5) schedule planning: in this final step, a detailed task list for each phase of the review is compiled. The estimated timeline for completing these tasks is reviewed and validated with the research supervisor or mentor, after which a formal project schedule is established.

As illustrated in Figure 3 below.

Figure 3: Module 1 - Planning

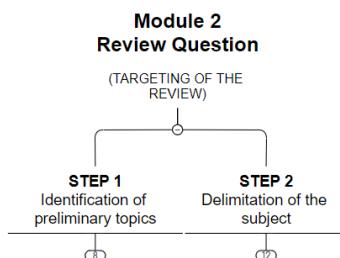


Source: (Borges, 2020).

MODULE 2 - REVIEW QUESTION

The *targeting of scientific evidence* in a systematic review process is enabled by defining a review question that should be simple and focused. Module 2 consists of two steps: (1) identification of preliminary topics: this step begins with consulting reference works related to the broad area of interest. After that, a specialized library is consulted to gather more specific resources on the research topic. Initial studies related to the review's theme are also reviewed to gain an understanding of the current knowledge and gaps in the field; (2) delimitation of the subject: in this step, the theme of the review is specified, narrowing the focus to a more targeted approach. The subject matter is further refined by identifying and specifying the exact object of study for the review. Once the object is clearly defined, the final task is to formulate the review question(s), which will guide the entire systematic review process. As illustrated in Figure 4 below.

Figure 4: Module 2 - Review Question



Source: (Borges, 2020).

MODULE 3 - BIBLIOGRAPHIC RESEARCH

The *research and evaluation of the scientific evidence* to be generated in the systematic review must be enabled by the main macro-process of the pathway, which corresponds to the structured bibliographic research. Module 3 consists of four stages:

(1) development of research strategies: this stage begins with identifying the significant keywords from the review question, followed by establishing terminological control to ensure consistent use of terms. Next, search expressions are formulated, and eligibility criteria for selecting studies are defined. Afterward, the appropriate research sources are evaluated and chosen, and a bibliographic management tool is selected to organize the findings. The process culminates with the assembly and validation of the systematic review protocol;

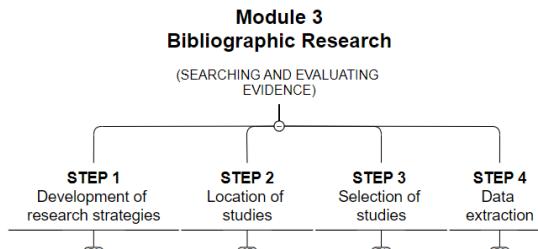
(2) location of studies: the process continues with a test of the search strategy to assess its adherence. Once this is confirmed, the selected research sources are accessed, and the search expressions are executed. The results are then evaluated, and the metadata of the relevant studies are exported for further analysis. Search alerts are created in the databases to track updates, and the results are recorded in the systematic review's bibliographic portfolio table;

(3) selection of studies: in this step, the studies undergo a filtering process. First, the titles of the studies are reviewed (first filtering), followed by an analysis of the abstracts (second filtering), and finally, a full-text analysis (third filtering). The pre-defined eligibility criteria are applied, duplicate records are removed, and reference lists from selected studies are reviewed to capture additional relevant sources. Any previously identified special or personal collections are also included in the selection. The process concludes with confirming the final selection of studies;

(4) data extraction: the final step involves organizing the selected studies into the definitive bibliographic portfolio of the systematic review. Data extraction forms are prepared for each included study, and the actual data analysis and extraction process is conducted, ensuring that all relevant information is gathered for the systematic review.

As illustrated in Figure 5 below.

Figure 5: Module 3 - Bibliographic Research



Source: (Borges, 2020).

MODULE 4 - DISCUSSION AND WRITING

The Systematic Literature Review process completion depends on the processing, documentation, and visualization of the scientific evidence generated in the review. Module 4 consists of three steps:

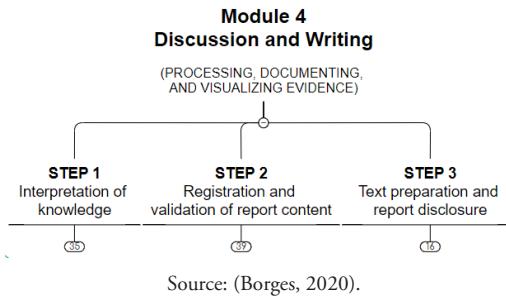
(1) interpretation of knowledge: this step focuses on two types of analysis to interpret the scientific evidence collected. First, a bibliometric analysis is conducted to quantitatively assess the studies, followed by a content analysis;

(2) registration and validation of report content: once the analysis is complete, the next step is to write the final version of the systematic review report. The text is then formatted according to the required standards. After formatting, a thorough content review is performed to validate the accuracy and consistency of the report;

(3) text preparation and report disclosure: in this final step, the report undergoes a review of language and style the abstract is translated into another language if necessary, and the report is standardized and formatted to meet publication or submission guidelines. The process concludes with the official registration and archiving of the final report.

As illustrated in Figure 6 below.

Figure 6: Module 4 - Discussion and Writing



Source: (Borges, 2020).

OBJECTIVES

In this general context, this work's goal is to detail the operational activities for implementing systematic literature reviews as permanent processes for monitoring Brazilian production in the IS field influenced by the UN's 2030 Agenda proposals. The target audience is the international scientific community in this field of knowledge. Specifically, agents involved in KO's research are invited to participate in this dialog.

The subproject comprises activities to map scientific research in Information Science in four areas: (1) scenarios of socio-economic high impact for information innovation; (2) academic-scientific methodologies oriented toward innovation in data analysis; (3) academic-scientific methodologies in data visualization; and (4) academic-scientific methodologies on terminology translation for the dissemination of specialized knowledge. The delimitation areas were summarized in four thematic Actions that group the systematic reviews established as specific Tasks.

Except for the two reviews established in the first year, the others six implemented reviews are at a similar stage of evolution. The terminology treatment subprocess defined to support stage 1 of module 2 of the Systematic Literature Review based on Structured Bibliographic Research for the six SRLs mentioned is in progress. The objective of this module is to develop the review question. Given the high level of thematic range of

each reviews, the following internal micro-path was defined to 'identify preliminary topics' in the literature:

- I. access the full text of each Sustainable Development Goals related to the systematic review for which each researcher is responsible (<https://brasil.un.org/pt-br/sdgs>);
- II. index, through intellectual extraction (and not through attribution), the free terms that represent the subjects explained in natural language in the original text of each Sustainable Development Goals proposed by the UN;
- III. analyze the subject by highlighting all the representative terms in the official description of each Sustainable Development Goals;
- IV. classify the terms identified as Generic Terms, Specific Terms, and Related Terms;
- V. hierarchical modeling of the general list of terms extracted and classified in an internal spreadsheet for the Treatment Terminologies of systematic reviews;
- VI. create a consolidated data matrix for each Sustainable Development Goals in the spreadsheet indicated.

FINDINGS

In the first year of the subproject, two systematic reviews grouped in the first thematic action. In the second year, the other six systematic reviews were established and distributed among the other grouping actions projected in the research modeling.

The 'data extraction' stage found the first Systematic Literature Review on People with Disabilities in Brazil. The second Systematic Literature Review on affirmative actions in national *stricto sensu* selection processes in Information Science is at the stage of 'development of research strategies'. Another six Systematic Literature Reviews are at the 'identification of preliminary topics' stage. Initial terminology processing was carried out by indexing the original content of the 17 Sustainable

Development Goals covered, resulting in a preliminary total of 716 free terms, as shown below.

ACTION 1.1 - SYSTEMATIC REVIEWS ON INFORMATION INNOVATION IN THE CONTEXT OF SUSTAINABLE DEVELOPMENT

1st review: “Systematic Literature Review for Information Innovation Applied to People with Disabilities in Brazil”. The pilot systematic literature review utilized the controlled vocabulary Health Sciences Descriptors / Medical Subject Headings (DeCS/MeSH) and the Brazilian Thesaurus of Information Science of the Brazilian Institute of Information on Science and Technology (TBCI/Ibict) to develop seven search strings leading to eight research expressions applied across 49 Information Science databases in the Capes Journal Portal. This result in 1,928 papers, from which 112 were filtered by title, 27 by abstract, and 36 additional references from full texts. After applying eligibility criteria, a final portfolio of 49 articles was established for further analysis. The review, led by researcher Fernanda Valle, focuses on “Scientific Map of Information Innovation on People with Disabilities in Brazil” within the context of the UN’s 2030 Sustainable Development Goals.

2nd review: “Systematic Literature Review on Affirmative Actions in Master’s and PhD Degree Selection Processes in Information Science (IS) in Brazil”. The second, entitled “Systematic Literature Review” on Affirmative Actions in Master’s and PhD Degrees Selection Processes in Information Science (IS) in Brazil”, is currently under development, led by researcher Mayara Gonçalves. The project has completed the five stages of Module 1 (Review Planning) and both stages of Module 2 (Review Question). Module 3 (Bibliographic Research) is underway, with the preliminary finding focusing on norms and practices of Affirmative Action policies in Brazil. After completing Module 3, Module 4 will address discussion, writing, and the visualization of evidence (Borges et al. 2023).

The others six reviews are at the terminology treatment stage, where terms are extracted directly from the descriptive content of each

Sustainable Development Goals (SDG). The themes of each review and the SDGs covered are shown below.

3rd review: “Systematic Literature Review on theories and methods of Knowledge Organization (KO) for innovation in contexts of information and sustainability, focused on the domains of decent work and economic growth, industry, innovation, and infrastructure”.

Sustainable Development Goals covered:

SDG 8 (Decent work and economic growth): 31 total free terms;

SDG 9 (Industry, innovation, and infrastructure): 19 total free terms;

SDG 12 (Responsible consumption and production): the terms have not yet been highlighted;

SDG 17 (Partnerships for the goals): 32 total free terms.

ACTION 1.2 - SYSTEMATIC REVIEWS ON INFORMATION INNOVATION IN THE CONTEXT OF SUSTAINABLE DEVELOPMENT ON INNOVATION IN DATA ANALYSIS IN THE CONTEXT OF SUSTAINABLE DEVELOPMENT

4th review: “Systematic Literature Review on academic-scientific data analysis for innovation in information and sustainability contexts within the scope of methods and techniques of Knowledge Organization (KO) of traditional populations and communities; gender equality; reduction of inequalities within the scope of Information Science”.

Sustainable Development Goals covered:

SDG 5 (Gender equality): 34 total free terms;

SDG 10 (Reduced inequalities): 24 total free terms.

5th review: “Systematic Literature Review on academic-scientific data analysis for innovation in information and sustainability contexts within the scope of methods and techniques of Knowledge Organization (KO) of

traditional populations and communities; gender equality; reduction of inequalities; quality education within the scope of Information Science”.

Sustainable Development Goals covered:

SDG 4 (Quality education): 34 total free terms;

SDG 5 (Gender equality): 17 total terms;

SDG 10 (Reduced inequalities): 15 total free terms.

ACTION 1.3 - SYSTEMATIC REVIEWS ON INFORMATION INNOVATION IN THE CONTEXT OF SUSTAINABLE DEVELOPMENT ON DATA VISUALIZATION IN THE CONTEXT OF SUSTAINABLE DEVELOPMENT

6th review: “Systematic Literature Review on analysis and visualization of academic-scientific data for innovation in information and sustainability contexts within the scope of Knowledge Organization (KO) methods and techniques in the domains of 1. clean water and sanitation, affordable and clean energy, 2. life below water, 3. life on land, and 4. climate action against global climate change within the scope of Information Science (IS)”.

Sustainable Development Goals covered:

SDG 4 (Quality education): 59 total free terms;

SDG 6 (Clean water and sanitation): 35 total free terms;

SDG 7 (Affordable and clean energy): 25 total free terms;

SDG 12 (Responsible consumption and production): the terms have not yet been highlighted.

SDG 13 (Climate action): 20 total free terms;

SDG 14 (Life below water): 49 total free terms;

SDG 15 (Life on land): 49 total free terms.

7th review: “Systematic Literature Review on analysis and visualization of academic-scientific data for innovation in contexts of information and sustainability within the domains of marginalized communities neglected in social innovation public policies for minorities; sustainable cities and communities; good health and well-being, peace, justice, and strong institutions of the scope of Information Science (IS).

Sustainable Development Goals covered:

SDG 1 (No poverty): 14 total free terms;

SDG 2 (Zero hunger and sustainable agriculture): 45 total free terms;

SDG 3 (Good health and well-being): 56 total free terms;

SDG 4 (Quality education): 37 total free terms;

SDG 5 (Gender equality): 23 total free terms;

SDG 10 (Reduced inequalities): 14 total free terms;

SDG 11 (Sustainable cities and communities): 18 total free terms;

SDG 16 (Peace, justice, and strong institutions): 30 total free terms.

ACTION 1.4 - SYSTEMATIC REVIEWS ON INFORMATION INNOVATION IN THE CONTEXT OF SUSTAINABLE DEVELOPMENT ON TERMINOLOGY TRANSLATION FOR THE DISSEMINATION OF SPECIALIZED KNOWLEDGE IN THE CONTEXT OF SUSTAINABLE DEVELOPMENT

8th review: “SLR in analysis and visualization of academic-scientific data for innovation in information contexts and sustainability in research and graduate degree in Information Science (IS)”.

Sustainable Development Goals covered:

SDG 4 (Quality education): 36 total free terms.

The Sustainable Development Goals coverage in the Systematic Literature Reviews in progress is shown below (TABLE 5).

Table 5: Distribution of thematic coverage of the Sustainable Development Goals (SDG) in the Systematic Literature Reviews in progress in Subproject 01

Systematic Literature Reviews (SLR) coverage:								
	1st SLR	2nd SLR	3rd SLR	4th SLR	5th SLR	6th SLR	7th SLR	8th SLR
SDG 1							X	
SDG 2							X	
SDG 3							X	
SDG 4	X	X			X	X	X	X
SDG 5				X	X		X	
SDG 6					X	X		
SDG 7						X		
SDG 8			X			X		
SDG 9			X					
SDG 10	X	X		X			X	
SDG 11							X	
SDG 12			X			X		
SDG 13						X		
SDG 14						X		
SDG 15						X		
SDG 16							X	
SDG 17			X					

Source: prepared by the authors.

DISCUSSION

Bibliographic Cartographies are considered, in the context of Subproject 01 - Research, maps of knowledge, or scientific maps, through which the goal is to elucidate agents, instruments, and objects of research, considering specific aspects of temporality and geolocation (Borges et al., 2023, p.5). The objective of research is to develop this type of study using the Systematic Literature Review method to model quantitative and qualitative research. Its purpose is to map initiatives with a high socio-economic impact that meet the criteria of social justice applied to information derived from

the intellectual production of the Brazilian Information Science within the scope of the 2030 Agenda (Borges et al., 2023, p.5).

Establishing the Systematic Literature Reviews developed in the subproject provided a model for the continuous study of the respective research subjects outlined, making it possible to answer specific questions by using original data published in the scientific literature in the area of Information Science in the context of sustainability. The presentation of the model also resulted in a planning process for verification, reproduction, and update of systematically revised data, along with the development of analytical matrices for scientific evidence from and for IBICT (Borges et al., 2023, p.5).

The eight reviews implemented specifically cover all 17 Sustainable Development Goals proposed by the UN. In addition, the subproject's integrated management modeling will allow these Systematic Literature Reviews to be updated and open up other revisions under the same theme of the 2023 Agenda. A Systematic Literature Review should be designed as a permanent monitoring process for the defined review question so that it can be maintained and updated periodically by the sponsoring institution through its agents.

CONCLUSION: METHODOLOGICAL BASES FOR A SYSTEMATIC NETWORK OF SCIENTIFIC DATA ON SUSTAINABLE DEVELOPMENT

The preliminary findings align with the objectives proposed by Subproject 01 - Research and are outlined in Study entitled "Bibliographic Cartographies via Systematic Literature Review". The second version of the methodological proposal called Systematic Literature Review based on Structured Bibliographic Research application proves to be methodologically satisfactory. It contributes to achieving these objectives within the scope of the modeling and the empirical field tested.

It is essential to highlight the relevance of further development of these reviews in the context of Ibict, considering that Systematic Literature Review is a basis, in theory, and method, for understanding and opening

up solutions for social reality in the 21st century due to its structure linked to the deductive nature and rationality of the development of modern science, together with empiricism and the bibliographic foundation of the scientific fact in modern times. Its rigorous application to substantiate scientific criticism confirms its relevance in the social, economic, and environmental scopes.

Central issues inherent to contemporary reality in terms of sustainability and social relations in the course of the Anthropocene, such as the spread of fake news, scientific denialism, and deforestation, have a force of rationality against barbarism in the expression of the SLR method and findings applied to the production of knowledge about life and society. The possibilities opened up by this study, considering the relationship between Systematic Literature Review and goals for sustainable development, are part of a movement of permanent scientific monitoring over the mechanisms of extermination and extinction of the most distinct forms and experiences of life, which encourages the SLR to become an infrastructure for sustainability perspectives.

The Systematic Literature Reviews that are currently in progress intend to offer a panoramic and updated national map of IS intellectual production on the analysis and visualization of academic-scientific data for social innovation in information and sustainability contexts. Given Ibict's tradition of carrying out bibliographic reviews since 1955, through the final papers of the specializations of the former Brazilian Institute of Bibliography and Documentation (IBBD), this unlocks a metamethodological field for continued research. The objective is to revisit this retrospect of the Institute as a continuation of the processes presented in this paper, which are still in progress.

Finally, the research demonstrates, through the dialogue between the bibliographic methods and the rigor of the systematic literature review model, a framework of methodological bases for a systematic network of scientific data on sustainable development. Its innovative proposal integrates both a look at the diverse possibilities of using bibliography as a method and the method of systematic literature review, as well as its scientific role in contributing to the identification of evidence on the

dangers of climate change. The result of this innovative perspective is the horizon of production of structured data for public policies necessary for economic and social transformation based on scientific evidence.

FINANCING

Ministry of Science, Technology and Innovation (MCTI); National Council for Scientific and Technological Development (CNPq); Coordination for the Improvement of Higher Education Personnel (Capes) and Fundação Carlos Chagas Filho de Amparo à Pesquisa do Estado do Rio de Janeiro (Faperj); Fundação de Amparo à Pesquisa do Estado de Minas Gerais (Fapemig); and Fundação de Desenvolvimento da Pesquisa (Fundep).

ACKNOWLEDGMENTS

Special acknowledgment to the executive team of Subproject 01 - Research, comprised of the following researchers: Edilma Macedo, Fernanda do Valle, Graciane Bruzinga; Isabelle Nunes, Lais Tuler, and Mayara Gonçalves. The second co-author acknowledges the CNPq, Brazilian Ministry of Education (Mec), Brazil, for awarding her a research productivity grant under process number PQ-1D | 313645/2020-5.

REFERENCES

Abbagnano, N. (2007). *Dicionário de Filosofia*. (4th ed.). Martins Fontes.

Acselrad, H. (2022 May). O “social” nas mudanças climáticas. *Liinc em Revista*, 18(1), 1-19.

Borges, G. S. B. (2020). *Proposta metodológica de revisão sistemática: Um estudo a partir de fundamentos da Biblioteconomia e da Ciência da Informação* [Tese de doutorado, Universidade Federal de Minas Gerais]. <https://repositorio.ufmg.br/handle/1843/70790>

Borges, G. S. B., Macedo, E. B., Valle, F., Gonçalves, M. S., Tuler, L. S. A., & Nunes, I. (2023). *Arquitetura de Gestão Integrada do Subprojeto 01: Pesquisa Modelagem e plano de execução de atividades (ano 1)*. (Projeto Articulação e Comunicação em Ciência e Tecnologia). Instituto Brasileiro de Informação em Ciência e Tecnologia, Brasília, DF.

Cardoso, J. R. (2010 March). Revisão sistemática e prática baseada em evidências na tomada de decisão em saúde. *Fisioterapia e Pesquisa*, 17(1), 5-6. Editorial.

Castro, A. A. (2001). *Revisão sistemática com e sem metanálise*. <http://www.usinadepesquisa.com/metodologia/wp-content/uploads/2010/08/meta1.pdf>

Centro Cochrane do Brasil. (1999). *Cochrane reviewers' handbook 4.0*. The Cochrane Collaboration. <http://www.centrocochranedobrasil.org.br/download.html>

Cochrane Community. (2019). *Glossary*. <https://community.cochrane.org/glossary>

Condillac, E. B. [1749] (1991). *Traité des systèmes*. Fayard.

Cook, D. J., Greengold, N. L. , Ellrodt, A. G., & Weingarten, S. R. (1997 August). The relation between systematic reviews and practice guidelines. *Annals of Internal Medicine*, 127(3), 210-216.

Cook, D. J., Mulrow, C. D., & Haynes, R. B. (1997 March). Systematic reviews: synthesis of best evidence for clinical decisions. *Annals of Internal Medicine*, 126(5), 376-380. <http://annals.org/aim/article-abstract/710356/systematic-reviews-synthesis-best-evidence-clinical-decisions>

Greenhalgh, T. (1997 September). How to read a paper: Papers that summarise other papers (systematic reviews and metaanalyses). *British Medical Journal*, 315, 672-675. <http://www.bmjjournals.org/collections/read.shtml>

Macdonald, G. (1999 March). Evidence-based social care: wheels off the runway? *Public Money & Management*, 19(1), 25-32.

Mulrow, C. D. (1987 March). The medical review article: State of the science. *Annals of Internal Medicine*, 106(3), 485-488.

Nhacuongue, J. A. (2022 May). A ciência e a ordem social: Ensaios para disruptão do antropoceno. *Liinc em Revista*, 18(1), 1-17.

Ohlsson, A. (1994). Systematic reviews: Theory and practice. *Scandinavian Journal of Clinical and Laboratory Investigation*, 54, 25-32.

Organização das Nações Unidas. (2024). Sobre o nosso trabalho para alcançar os objetivos de desenvolvimento sustentável no Brasil. <https://brasil.un.org/pt-br/sdgs>.

Peignot, G. (1802). *Dictionnaire Raisonné de Bibliologie, tomo I*. Chez Villier.

Saldanha, G. S., & Silva, L. K. R. da. (2017 July). Os sistemas bibliográficos em Gabriel Peignot: Uma metabibliografia científica. *Perspectivas em Ciência da Informação*, 22(nesp.), 96-119.

Sampaio, M. I. C., & Sabadini, A. A. Z. P. (2014 July). Psicologia baseada em evidências: Conhecimento científico na tomada de decisão. *Revista Costarricense de Psicología*, 33,(2), 109-121.

Tranfield, D., Denyer, D., & Smart, P. (2003 September). Towards a methodology for developing evidence-informed management knowledge by means of systematic review. *British Journal of Management*, 14(3), 207-222.

Wolf, F. M., Shea, J. A., & Albanese, M. A. (2001 February). Toward setting a research agenda for systematic reviews of evidence of the effects of medical education. *Teaching and Learning in Medicine*, 13(1), 54-60.

Yetley, E. A., MacFarlane, A. J., Greene-Finstone, L. S., Garza, C., Ard, J. D., Atkinson, S. A., Bier, D. M., Carriquiry, A. L., Harlan, W. R., Hattis, D., King, J. C., Krewski, D., O'Connor, D. L., Prentice, R. L., Rodricks, J. V., & Wells, G. A. (2016 December). Options for basing Dietary Reference Intakes (DRIs) on chronic disease endpoints: Report from a joint US-/Canadian-sponsored working group. *American Journal of Clinical Nutrition*, 105(1):249S-285S.

Decolonial practices of Knowledge Organization: a Brazilian literature overview

*Admeire da Silva Santos Sundström*¹

*Heloá Cristina Camargo de Oliveira*²

ABSTRACT: Decolonial practices have driven new parameters to integrate marginalized communities in a colonized society, and it has been influencing different disciplines in their methods and theories. Libraries, archives, and museums (LAM) are also integrating new approaches that argue to prioritize and represent different forms of knowledge production. In this sense, this article investigates how Knowledge Organization in Brazilian literature has been approaching, in the last 10 years, decoloniality in its methods, theories, and practices. Our goal is to understand how the concept of decoloniality has been adopted and shaped from the Brazilian Knowledge Organization theoretical field. The method is the literature review. As a result, we identified that the decolonial thinking in the Brazilian Knowledge Organization literature has been building its bases on women, Brazilian-African communities, Indigenous, and LGBTQ. We conclude here that the field remains behind compared to other countries, however, it has a range of possibilities.

KEYWORDS: Decolonial practices. Knowledge organization. Marginalized communities.

INTRODUCTION

As Hjorjand (2008) argues, Knowledge Organization is a field that investigates not only the process of organizing knowledge but also the

¹ Linnaeus University, Växjö, Sweden.

E-mail: admeire.dasilvassantossundstrom@lnu.se | ORCID ID: <https://orcid.org/0000-0003-4873-8592>

² Universidade Federal de Rondonópolis, Brazil.

E-mail: heloa.oliveira@ufr.edu.br | ORCID ID: <https://orcid.org/0000-0003-2466-6678>

<https://doi.org/10.36311/2025.978-65-5954-624-4.p503-521>

systems created to organize, represent and retrieve documents. However, the existing Knowledge Organization Systems (KOS) were built on a bias of gender, sexuality, race, age, ability, ethnicity, language, and religion, which limit the possibilities of expressing diversity in representing information. Beghtol (2009) also pointed out that the systems reflect society and therefore lack neutrality in their approaches. In this sense, KOS are not only occasionally hierarchical and predetermined, but also possess power within the categorization process, whether intentionally or unintentionally (Montoya, 2022, p.50).

Even biased, these systems of classification and index have been widely adopted worldwide and portrayed as neutral tools. This leads to consequences for the users who look for information in a biased system. Which main encounter a conceptual violence (Fox & Reece, 2012). Consequently, users do not see themselves represented in the system or see themselves in a misrepresented way (Olson & 2001, p.549).

However, questioning the universalism and neutrality of these systems is not new. In 2016, for example, a group of researchers discussed the possible conflicts that can emerge from local needs and global knowledge organization systems. In this panel composed of Melissa A. Adler, Joseph T. Tennis, Daniel Martínez-Ávila, José Augusto C. Guimarães, Jens-Erik Mai, among others, an overview was provided of the epistemological, practical, and ethical dimensions in conceptualizing the dynamic between local and global knowledge when it comes to organizing it (Adler et al., 2016).

Other perspectives also contributed to addressing this issue, such as: Andersen & Skouvig (2006) who argue that the legitimization of Knowledge Organization must be situated from a sociohistorical point of view. Fox (2016) has been addressing the issue from a gender perspective, while Guerrini (2022) examines the universalism of bibliographic control. Thus, Gutiérrez (2014) believes that we should work with the concept of declassification, since, for the author, when classifying, we are already removing that concept from one context and placing it in another. As he states, “Classification veils, divides, and separates while declassification reveals, aggregates, and reunites.” (Gutiérrez, 2014, p.394).

Decolonial thinking has been influencing various disciplines as well as contributing to the emergence of new theoretical approaches and methods which consider the knowledge production in marginalized communities (Walsh, 2018). In Knowledge Organization, as we have seen in the literature, there is a strong current that has been questioning the presence of local knowledge in global systems, as well as how catalogs reflect this dichotomy. However, what we will address here as decolonial practices in Knowledge Organization involve the identification and criticism of colonial methods, and the creation of new tools that recognize and recentralize plurality.

In that regard, Doyle et al. (2015, p.115) address the theory of Indigenous warrants, which embraces Indigenous self-representation and their knowledge to create a KOS from and for them. From the Canadian perspective, research around Indigenous librarianship has been steering the notion of how we can create strategies to decolonize the KOS. Therefore, our objective is to analyze the Brazilian scenario to understand the nuances of decolonial approaches.

With that said, the questions of the study are: How have the concepts of decolonization and decoloniality been approached in knowledge organization in a Brazilian scenario? What KOS has been covered as decolonial practices? What communities have been addressed in Brazilian decolonial approaches from the KOS perspective?

This article is part of the ongoing project “Knowledge Organization Systems in Ethnic Collections”, a research group initiated in 2022 by the authors of this paper. It intends to contribute to the project’s ongoing discussions and identify the Brazilian state of the art on knowledge organization decolonial research.

This paper has the following structure: Firstly, we present a brief discussion related to the concept of decoloniality and decolonization. Secondly, we introduce some approaches in an international scenario prioritizing articles in English. Thirdly, we describe the methodological path, and, finally, the results identified in the Brazilian literature.

THE DECOLONIAL PERSPECTIVE

As explained by Mignolo and Walsh (2018), decoloniality cannot be considered merely a new paradigm or a critical thought; it also involves praxis, which provides marginalized groups with the methodological and theoretical tools to reflect on and center their worldview within new epistemological, sociological, historical, cultural, and economic parameters. The authors investigate various practices, ranging from political projects to pedagogical approaches, demonstrating how decoloniality evolves into collective actions.

Mignolo and Walsh also conduct a theoretical discussion explaining the conceptual framework and establishing the difference between the concepts of decoloniality and decolonization. They assert: “Decoloniality is not, and cannot be, state-led projects. They are projects by people organizing themselves in their local histories and needs to delink from the colonial matrix.” (Mignolo & Walsh, 2018, p.115). As the authors describe, the concept of decoloniality implies a triad of concepts: modernity, coloniality, and decoloniality. Since decoloniality puts light on coloniality, it shows what the author calls the darker side of modernity.

In Brazil, the social movement named the Brazilian Landless Workers’ Movement (in Portuguese *Movimento dos Trabalhadores Rurais Sem Terra*, MST) is an example of decolonial praxis involving territorial vindication. Coletti (2005) classified the MST as the resistance to neoliberal hegemony that has been growing in Brazil. In addition to claiming for a new regulation related to agrarian reform, the MST social movement also has new methods in agriculture, media coverage, education, and religion. Their agriculture method follows a sustainable development, which prioritizes the preservation of natural resources, and avoids the use of chemical inputs.

The example of MST can be seen as decolonial thinking, since this social movement represents a group that can be considered a micro-narrative, standing up and claiming to change and transform in a colonial territorial division. Nevertheless, Mignolo and Walsh (2018) present a distinction between the concepts of decolonization and decoloniality:

“Decolonization is the more usual world for the efforts to confront the ongoing colonial condition.” (p.49). As decoloniality is related to the emergence of new narratives including new cultural and social movements, as the decolonization embraces the historical process of unbuilding colonialism (Ariese et al., 2022).

Latin America, in the context of colonization, had to coexist with two worlds - the colonial and the modern, resulting in an unstable construction of its people identity. The colonial past is considered a historical ghost that needs to be brought to light, otherwise, it will remain trapped in the coloniality of power and its dependence, failing to reach the new world (Castro & Castro, 2018).

In addition to this constant struggle, it is a quest to maintain culture amidst the dissolution of an increasingly globalized world. For Latin American countries, six elements can be identified as shocking in the recognition of identity: metropolitan parasitism (which can be summarized in the exploitation of natural resources, in a short-term and elitist view); the already mentioned coexistence of two historical worlds; Thorp's Empty Box (with ethnicity determining history, with lack of growth with equity); ethnicity as a marker of social categories; the federative form of the State and its social relations (often with an exploitative and even tyrannical and corrupt posture); and language, culture, and racism (which demonstrate a non-respectful coexistence of different ethnicities). (Castro & Castro, 2018).

The recent shifts in global politics, characterized by the appreciation of capitalism at the expense of acknowledging the complexity of human development, and the exploratory potential of its market expansion, guided new fronts that began to reach the current territories still under the protection of Indigenous peoples. This poses a significant risk to an entire environmental domain these people have long protected.

Harmonious coexistence and interaction would be (in the face of the growing complexity of plural societies, formed by people with different ways of living, with their own wealth of customs and worldviews), the basis of a local and global collective force, recognizing it as one of the world's

heritage – and this relationship is called by IFLA “ ‘cultural diversity’ or ‘multiculturality’ ” (International Federation Of Library Associations And Institutions – IFLA, 2020).

The still real division of the world poses different international perspectives that propose to help the decolonization process, but there is still a need to develop and clarify the complexity of this attitude. In countries labeled as “first”, “second” or “third” world, a reality has become clear - many people live in a “4th world”, a metaphorical representation of people who, although sharing the same “societal plane” with others, remain largely invisible (Oliveira, 2020).

They are people who survive in a parallel reality, which do not fit the descriptions and “goals of the millennium”. Time passes differently between worlds. They cohabit, and they coexist, but in a predatory way - the 4th world is the food of the rest - its fuel. They exist because they serve others, and if that service is not justified, neither is their existence.

Many of this world’s inhabitants know about the denial of their existence and, therefore, they also know that no one will miss what never existed, or at least no one with enough voice to be heard, and therefore they have no alternative but to conform to the barriers that surround them, of the invisibility that curses them, and then they survive with what life proposes to them.

Others, aware of this reality and with the intention of breaking it, venture into great battles in search of breaking down the barriers that are imposed on them and go out to demand their rights. However, there are many challenges and so far, it has been seen that society has been able to open spaces for insertion, but few for inclusion. This means that people get the right to be in spaces that for a long time did not “belong to them”, but that these spaces are still not capable of promoting an environment of inclusive equity (Oliveira, 2020).

The International Federation of Library Associations and Institutions (IFLA) has a good example of a decolonial project: a section named Indigenous Matters-Action Plan 2021-22 which presents a guideline for library actions which prioritize the Indigenous knowledge in its addressing.

The guideline is tied to The UNESCO Decade of Indigenous Languages (2022-2032) which is linked to the document United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP). The document determines that Indigenous peoples have the right to preserve their languages, cultures, and knowledge.

In this context, IFLA published a Special Issue on Indigenous Librarianship, which was also reviewed in Sundström (2023). The number includes research from different parts of the world which describes different strategies and methods to organize and represent Indigenous knowledge considering their own knowledge production and representation. As Sundström (2023) reviewed, the IFLA publication clarifies that the decolonial practices in LIS involve a set of concerns which should center Indigenous knowledge. A common agreement from the reviewed articles, among them Gosart (2021) and Komeji et al. (2021), states that the Indigenous knowledge cannot be placed in an old-fashioned pre-established scheme. So, decolonization in this context means not only review the system itself, but also identifying the notion of knowledge in each community and then continue by asking how the tools should be constructed to approach their knowledge. The decolonization here goes beyond the new set of organization and representation arguing reducing the damage caused by biased systems Sundström (2023).

METHODOLOGY

This research collected data using bibliographic methods, with the main focus on conducting a literature review, addressing decoloniality and KO in the fields of librarianship, archival science, and museology in a Brazilian scenario. It applied a content analysis in the retrieved results, (Zhang & Wildemuth, 2016). It was selected five databases: **BRAPCI**: *Base de Dados Referenciais de Artigos de Periódicos em Ciência da Informação* (BRAPCI), **SCIELO**: Scientific Electronic Library Online, **Periódicos CAPES** - Portal de Periódicos da Coordenação de Aperfeiçoamento de Pessoal de Nível Superior, **BDTD** The Brazilian Digital Library of Theses and Dissertation, and The Brazilian Open Access Publications and Scientific Data Portal (OASISBR).

The *Base de Dados Referenciais de Artigos de Periódicos em Ciência da Informação* (BRAPCI) is the product of the research project “Methodological options in research: the contribution of the information area to the production of knowledge in higher education”, whose objective is to support studies and proposals in the area of Information Science. It contains titles of journals in the area of Information Science (IS) and indexes their articles, constituting a referential database. It currently provides abstracts of 19,255 texts published in 57 national printed and electronic journals. (BASE DE DADOS EM CIÊNCIA DA INFORMAÇÃO - BRAPCI, 2023). The search strategies used were: *decoloniza** to analyze a more global retrieval on the topic in the area, and *decoloniza* AND organização do conhecimento* as descriptors in a second query for a more specific retrieval.

The Scientific Electronic Library Online (SCIELO) is a repository for research data aligned with best practices and international standards for research data management, organized in the cooperative model by the institutions São Paulo Research Foundation - FAPESP, National Council of Scientific and Technological Development - CNPq, Latin American and Caribbean Center on Health Sciences Information - BIREME, and Foundation of Support to the University of São Paulo - FapUnifesp. It currently contains 399 journals and 485,196 documents. (Scientific Electronic Library Online, n.d.). The search strategies applied were: *Decoloniza** as a descriptor, with the Information AND Library in the area filter; *Decoloni* AND organização do conhecimento*, without other filters; and *Decoloni* AND Ciência da Informação*, without other filters.

The *Portal de Periódicos Capes* is one of the largest virtual libraries in Latin America, with national productions and subscriptions of international publishers to teaching and research institutions in Brazil. There is diverse content distributed in more than 49,000 full-text journals and 455 databases. It is high-level scientific content available to the Brazilian academic-scientific community. (Coordenação De Aperfeiçoamento De Pessoal De Nível Superior - CAPES, 2022). The search strategies applied were: *Decoloniza* AND organização do conhecimento*.

The Brazilian Digital Library of Theses and Dissertation (BDTD), developed and coordinated by the Brazilian Institute of Information in Science and Technology (IBICT), integrates and disseminates the complete texts of theses and dissertations defended in Brazilian teaching and research institutions (IBICT, 2023). The search strategies applied were: *decoloniza** AND *organização do conhecimento* as descriptors.

The last database included in this article was the multidisciplinary portal The Brazilian Open Access Publications and Scientific Data Portal (OASISBR), an initiative of the Brazilian Institute of Information in Science and Technology (Ibict), with “scientific production and research data in open access, published in scientific journals, digital repositories of scientific publications, digital repositories of research data and digital libraries of theses and dissertations” (OASISBR, 2024).

The first data collection was performed on April 15th, 2023, and the second one on almost all basis³, to actualize and amplify the results on 18th January 2024. The descriptors and filters were qualitative and adapted to the different databases used.

Criteria of inclusion: When the first truncation was used as “decoloni*”, after analysis of the titles and abstracts, then retrieved documents that were not relevant to the objective of this article, because of that, the search was performed using the word “decoloniza*” and “Knowledge organization”. After qualitative analysis of the content of the recovered works, articles that presented discussions on the concept of decoloniality in the Organization of Knowledge in the Brazilian context were included in the data for analysis. Articles that just mentioned the words without the theoretical discussion, or that weren’t in the Information Science aim weren’t considered valid data for this analysis. The results obtained are shown in Table 1.

³ We intended to conduct a new search at BRAPCI during December 2023 and January 2024 to update the results, however the database was unavailable due technical issue.

Table1: Literature review

Base	Descriptors	Total retrieved	Excluded by duplicated data	Data to analisys
BRAPCI	Decoloniza*	13	2	11
BRAPCI	decoloniza* AND organização do conhecimento	2	0	2
SCIELO	Decoloniza* Área Information AND Lybrary	1	0	1
SCIELO	Decoloni* AND organização do conhecimento	2	0	2
SCIELO	Decoloni* AND Ciência da Informação	3	1	2
CAPES	Decoloniza* AND organização do conhecimento	10	0	10
CAPES	Decoloni* AND “organização do conhecimento”	3	0	3
BDTD	Decoloniza* AND “organização do conhecimento”	2	0	0
BDTD	Decoloni* AND “organização do conhecimento”	2	0	2
OASIS	Decoloni* AND Organização do Conhecimento	3	0	3
Total				36

After the exclusion of the duplicated references, 36 articles were selected. The titles and abstracts were read for the analysis of the criteria of inclusion and exclusion. The results are shown in Table 2:

Table 2: Application of the criteria of inclusion

Database	Title/Journal	Authors	Year
BRAPCI	Decolonizando a organização do conhecimento/ Tendências da Pesquisa Brasileira em Ciência da Informação	Garcez, D.; Sales, R.	2021

BRAPCI	Decolonizing the collections of public libraries: formation of collections of Afro-Brazilian literature / Palavra Clave	Tanus, G.; Souza, G.	2022
BRAPCI	Decolonizing the Organization of Knowledge: concepts, theories and epistemologies of Abya Yala/ Science of Information Express	Garcez, D.	2022
SCIELO	La organización del conocimiento desde la perspectiva poscolonial: itinerarios de la paraconsistencia.. Perspectivas em Ciência da Informação, v.18, n.4, p.93-111, out./dez..	García Gutiérrez	2013
CAPES	Das árvores do conhecimento aos rizomas e rukus. Clarice Sumi. Fronteiras da representação do conhecimento/	Gracioso, L.; Almeida, M. Kawasaki, C.	2022
CAPES	Por um reflexão sobre a organização e representação de conceitos decoloniais na América Latina: O pensamento de Aníbal Quijano à luz da Análise de Domínio / Encontros Bibli.	Albuquerque, A.	2023
CAPES	Biblioteconomia indígena: tramas encantadas pela terra viva / Encontros Bibli.	Menezes, V.	2023
BDTD	A invisibilidade do feminismo negro nos instrumentos de representação do conhecimento: uma abordagem de representatividade social	Reis, V..	2019

The titles and abstracts were read to include or exclude articles within the topic. After that, a reading of the full text was performed. The final data were qualitatively analyzed, consistent with the objectives of the work, and will be presented in the following topic.

RESULTS AND DISCUSSIONS

The first article analyzed is Garcez and Sales, published in 2021. It presents an interesting search for the theme within international publications, using for that the publications of the Knowledge Organization journal, from 2000 to 2020. Although the article matches our selection criteria, they do not distinguish the usage of the terms decoloniality and decolonization, consequently, these concepts are taken as synonyms.

However, the authors present a paramount discussion related to the possibilities of knowledge that should be covered in KOS. Such as Cultures, beliefs, ethnicities, gender, population groups, languages, and habits.

According to Garcez and Sales (2021) all these points generate knowledge, and when they are not represented, their existence is infringed. As stated by them, to address the plurality of knowledge in a KOS, is necessary to ensure approaches from a decolonial and decolonized perspective.

The authors present discussions regarding “epistemic violence”, and highlight “[...] through invisibility and exclusion of knowledge from other ethnic-racial and social groups that do not belong to the hegemonic group that is in power.” and that would already be naturalized in the context of colonial power (Garcez & Sales, 2021, p.7 , our translation).

From the theoretical viewpoint, it was possible to identify that when considering decoloniality and decolonization as synonyms, this may lead to further uncertainties. However, the authors presented the marginalized groups driving the discussion on decoloniality in a broader perspective, such as women, people with Latin American backgrounds, African, Indigenous, Amerindian, and riparian communities.

As we noticed, the authors also identified Brazilian studies that indirectly consider and contribute to decolonial processes being related to Knowledge Organization. The aforementioned studies identified as being more directly related to the Brazilian context are focused on gender issues, African religions, the study of “oppressed groups”, and Amerindian thought.

The researchers conclude that the explicit use of terms such as decolonization and decoloniality is still quite limited and only begins to emerge in 2016; they use the term “deseuropeização” of archival description; and emphasize that the representation of marginalized peoples, religions, and languages in Knowledge Organization Systems are a first step in the search for the decolonization in the Knowledge Organization international research.

From the study of the first text, two points stand out: the need to clarify the difference between the terms decoloniality and decolonization; and a still expanding manifestation of studies in the area, not only in the national context but also in a representative publication in Knowledge Organization international research.

The second article analyzed, published in 2022 by Garcez, is a 1-page long paper that presents some general concepts that apparently will guide a broader study.

The title mentions a study directed to “Abya Yala concepts, theories and epistemologies” which, although not clarified in the text, possibly relates to the appropriation of the term Abya Yala, originating from the language of the Kuna people (which would mean “Mature Land”, “Live Earth” or “Land in bloom”) and which has been used as a synonym for “America”, in a “self-designation of the originating peoples” (Porto-Gonçalves, 2023, our translation).

The author establishes three guiding points in her search for decolonial approaches in the scientific production of Knowledge Organization:

- a) Discussions on oppression, under-representation, and relations of power and domination against marginalized populations; b) Discussions on knowledge production by geographically privileged populations (global north), but which are outside the societies to which they belong; and c) Critical reflection on coloniality and proposal of decoloniality as an alternative for confrontation. (Garcez, 2022, our translation).

During our analysis, we identified a challenge faced by these retrieved articles in translating the terms to Portuguese.

The third and last article analyzed was published in 2022 by Tanus e Souza and presents a broad discussion about the need to decolonize the collections of Brazilian public libraries. The authors are anchored in the characterization of these libraries as democratic spaces for access to information and as representative places of a society identified as diverse.

The importance of formalizing the process to decolonize collections is highlighted, especially in collection development policies, to ensure legitimacy and continuity. Although it focuses on the reported absences of authors, the absence of black-Brazilian themes, points of view, language, and audiences in public library collections are also highlighted. Also,

other themes the authors fail to discuss in these collections are mentioned: women, feminists, Indigenous people, and LGBTQIA+.

It is worth highlighting that the presence of the book is one of the paths of political action and transformation, but it does not end with the practice of acquiring and placing it on the shelf. The book, in its modifying potential, needs to be read, debated, and dialogued; in which the library is a space for mediation actions, in particular, cultural mediation [...]. (Garcez, 2022, p. 3, our translation).

Albuquerque (2023) explains the background of the theoretical approach to decoloniality in Latin America. The article centers on a specific researcher Anibal Quijano, and his research group called “*Modernidade/ Colonialidade*” which was paramount to introduce decoloniality perspective in Latin America, gathering other research such as: “Edgardo Lander, Arthuro Escobar, Walter Mignolo, Enrique Dussel, Fernando Coronil e Aníbal Quijano” (Albuquerque, 2023). Quijano was essential in identifying how coloniality was entered into society.

Menezes (2023) mentioned some initiatives in representing Indigenous knowledge, however, the author focused on this article to illustrated the complexity of librarianship in embracing Indigenous knowledge, since the word “library” means their land, knowledge is something alive, and all objects part of their reality has life on it. “In Indigenous worlds, every object of interpretation is understood as another person, that is, the act of interpretation itself presupposes the personhood of what is being interpreted, therefore, every object is also a subject.” (Menezes, 2023, p.4, translated from Portuguese). The author also distinguishes between the Indigenous Librarianship and the Indigenous Knowledge Organization (OCI), when the first is a field, and the second one is methodology (Menezes, 2023).

Reis (2019) identified the terminology that represents the black feminist literature and inspected how the current controlled vocabulary has been covering this area. As a result, they face the incapacity of these

tools in representing the topic, and they emphasize the importance of constructing controlled vocabularies that serve Brazilian Black literature.

This critical view goes beyond the materiality addressed and demonstrates a concern with the complexity imposed by decoloniality. Even if the researchers demonstrate a scarce field of studies focused on decoloniality from the Brazilian perspective, they show us that the field is deep in complexity and with possibilities for development.

CONCLUSION

As a result, we will highlight some points, firstly the translation issues with the terms un-colonial (*descolonial*) and decolonial (*decolonial*), which may have an impact on the development of the literature on the subject. Santos (2018), among the authors reviewed here, argues about the importance of the theoretical and political differences between these terms, where the first one relates the “un-colonial” as a counterpoint to “colonialism” and decolonial as a contraposition to “coloniality”. When consulting some dictionaries, the terms un-colonial (*descolonial*) and decolonial (*decolonial*) may have been translated as synonyms.

Secondly, decoloniality has a more complex perspective, concerned with colonial structures beyond the condition of the colony itself. This can impact the attention directed to practices without problematizing the complex social aspects involved. This issue is relevant to knowledge organization as it allows for a critical examination of how informational tools are created and their impact on society.

Thirdly, we believe that this concern about how informational tools, their structures, and foundations are constituted in the scope of decoloniality can offer the possibility of strengthening the decolonial paradigm in the areas that work with information and heritage.

It was possible to conclude that Brazilian studies about decoloniality and Knowledge Organization (KO) are still in their initial phase, but there is an emphasis on the already existing practices that can be identified as decolonial and are being implemented across various information units.

These practices have a great impact on the search for the development and application of the decolonial paradigm, but they need to be further studied to understand and affirm their scope in this context. It is suggested that future texts explore the practical issues highlighted to give visibility to the real state of the art of research that may or may not be framed within decolonial conceptions.

Greater development of the theme in the national context is viewed as a way to contribute to the international development of decoloniality in informational spaces, especially Archives, Libraries, and Museums, recognized here as important spaces for the development of decolonial thought.

REFERENCES

Adler, M. A., Tennis, J. T., Martínez-Ávila, D., Guimarães, J. A. C., Mai, J. E., Olesen-Bagneux, O., & Skouwig, L. (2016). *9 Global/local knowledge organization: Contexts and questions*. [Apresentação de trabalho]. Proceedings of the Association for Information Science and Technology, (pp.1-4). American Society for Information Science, Silver Springs.

Albuquerque, A. C. de. (2023). Por uma reflexão sobre a organização e representação de conceitos decoloniais na América Latina: O pensamento de Aníbal Quijano à luz da Análise de Domínio. *Encontros Bibli*, 28(spe). <https://doi.org/10.5007/1518-2924.2023.e92960>

Andersen, J., & Skouwig, L. (2006). Knowledge organization: A sociohistorical analysis and critique. *The Library Quarterly*, 76(3), 300-322.

Ariese, C. E., Pozzi, L., & Wawrzyniak, J. (2022). Curating colonial heritage in Amsterdam, Warsaw and Shanghai's museums. In B. T. Knudsen, J. Oldfield, E. Buettner, & E. Zabunyan, *Decolonizing colonial heritage: New agendas, actors and practices in and beyond Europe* (pp.125-142). Taylor & Francis.

Base de Dados em Ciência da Informação. (2023). *Sobre a BRAPCI*. <https://brapci.inf.br/index.php/res/about>.

Beghtol, C. (2009). Classification theory. In *Encyclopedia of library and information science* (3rd ed.). Taylor & Francis.

Brazilian Institute of Information in Science and Technology. (2023). Instituto Brasileiro de Informação em Ciência e Tecnologia (IBICT). <https://www.ibict.br>

Brazilian Institute of Information in Science and Technology. (2023). Oasisbr: Brazilian Open Access Publications and Scientific Data Portal. <https://oasisbr.ibict.br/vufind/about?lng=en>

Castro, R. C. M. L., & Castro, P. S. (2018). Reconhecimento dos povos latino-americanos entre suas próprias nações: uma questão de identidade ou de interesse? In B. Paredes, *O Mundo Indígena na América Latina: Olhares e perspectivas* (pp. 441-463). Edusp.

Coletti, C. (2005). *A trajetória política do MST: Da crise da ditadura ao período neoliberal*. Unicamp.

Coordenação de Aperfeiçoamento de Pessoal de Nível Superior. (2022). *Quem somos*. <https://www-periodicos-capes-gov-br.ez1.periodicos.capes.gov.br/index.php/sobre/quem-somos.html>.

Doyle, A. M., Lawson, K., & Dupont, S. (2015). Indigenization of knowledge organization at the Xwi7xwa Library. *Journal of Library and Information Studies* 13 (2): 107-34.

Fox, M. J. (2016). Subjects in doubt: the ontogeny of intersex in the Dewey Decimal Classification. *KO Knowledge Organization*, 43(8), 581-593.

Fox, M. J., & Reece, A. (2012). Which ethics? Whose morality?: an analysis of ethical standards for information organization. *Knowledge Organization*, 39(5), 377-383.

Garcez, D. C. (2022). Decolonizing a Organization do Conhecimento: Conceitos, teorias e epistemologias de Abya Yala. *Ciência Da Informação Express*, 3, 1-3. <https://doi.org/10.60144/v3i.2022.47>

Garcez, D. C., & Sales, R. (2021). Decolonizing a organização do conhecimento: Um olhar do periódico Knowledge Organization (2000-2020). *Tendências da Pesquisa Brasileira e Ciência da Informação*, 14, 1-21

Gosart, U. (2021). Indigenous librarianship: Theory, practices, and means of social action. *IFLA Journal*, 47(3), 293-304. <https://doi-org.proxy.lnu.se/10.1177/0340035221991861>

Guerrini, M. (2022). Universal bibliographic control in the digital ecosystem: opportunities and challenges. *JLIS: Italian Journal of Library, Archives and Information Science= Rivista italiana di biblioteconomia, archivistica e scienza dell'informazione*: 13(1), 12-18.

Gutiérrez, A. G. (2014). Declassifying knowledge organization. *Knowledge Organization*, 41(5), 393-409.

Hjørland, B. (2008). What is knowledge organization (KO)? *Knowledge Organization*, 35(2-3), 86-101.

Instituto Brasileiro de Informação em Ciência e Tecnologia. (n.d.). *Sobre a BD TD*. <https://bdtd.ibict.br/vufind/>. Access in: 20 Apr. 2023.

International Federation of Library Associations and Institutions. (2020). IFLA annual report 2020. IFLA. <https://repository.ifla.org/items/2d75bf3e-610e-4eb2-9f03-c2f59caedb06>

Komeiji, K., Long, K., Matsuda, S., & Paikai, A. (2021). Indigenous resource management systems as models for librarianship: I waiwai ka ‘aina. *IFLA Journal*, 47(3), 331–340. <https://doi-org.proxy.lnu.se/10.1177/0340035221991561>.

Menezes, V. S. de. (2023). Biblioteconomia indígena: Tramas encantadas pela terra viva. *Encontros Bibli*, 28(spe). <https://doi.org/10.5007/1518-2924.2023.e92861>

Mignolo, W. D., & Walsh, C. E. (2018). *On decoloniality: Concepts, analytics, praxis*. Duke University Press.

Montoya, R. D. (2022). *Power of Position: Classification and the Biodiversity Sciences*. MIT Press.

Oliveira, H. C. C. (2020). *The phenomenological nature of mediation: Contributions to mediation of information*. Thesis [PhD in Information Sciences & Education in the Knowledge Society] Faculty of Philosophy and Sciences, Universidade Estadual Paulista, Marília & Faculty of Translation and Documentation, Universidad de Salamanca, Salamanca.

Olson, H. A. (2001). The power to name: Representation in library catalogs. *Signs: Journal of women in culture and society*, 26(3), 639-668.

Porto-Gonçalves, C. W. (2023). *Abya Yala*. <https://sites.usp.br/prolam/abya-yala/>.

Reis, V. J. S. dos. (2019). A invisibilidade do feminismo negro nos instrumentos de representação do conhecimento: Uma abordagem de representatividade social [Master's dissertation, Universidade Federal da Bahia, Programa de Pós-Graduação em Ciência da Informação]. Repositório Institucional UFBA. <http://repositorio.ufba.br/ri/handle/ri/30429>

Santos, V. M. (2018). Disobedient notes: Decoloniality and the contribution to the feminist critique of science. *Psicología & Sociedad*, 30(e200112), 1-11.

Scientific Electronic Library Online. (n.d.). *About SciELO Data*. <https://scielo.org/en/about-scielo/scielo-data-en/about-scielo-data/>

Scientific Electronic Library Online. (n.d.). *Collection composition*. <https://analytics.scielo.org/>

Sundström, A. D. S. S. (2023). Ethical issues from decolonial practices in Knowledge Organization: The case of indigenous collections in Världskulturmuseet. *Knowledge Organization*, 50(6), 439-451.

Tanus, G. F., & Souza, G. T. C. (2022). Decolonizando os acervos das bibliotecas públicas: Formação de coleções de literatura afro-brasileira. *Palabra Clave*, 12(1), e170.

The Brazilian Open Access Publications and Scientific Data Portal. (n.d.). *The Oasisbr*. <https://oasisbr.ibict.br/vufind/about/home?lng=en>

Walsh, C. E. (2018). Decoloniality in /as praxis. In: W. D. Mignolo, & C. E. Walsh (2018), *On decoloniality: Concepts, analytics, praxis* (pp.15-102). Duke University Press.

Zhang, Y., & Wildemuth, B. M. (2016). Qualitative analysis of content. In B. M. Wildemuth (Ed.), *Applications of social research methods to questions in information and library science* (2nd ed., pp. 318–329). Libraries Unlimited.

Indexing guidelines for self-archiving policies in institutional repositories in southern and southeastern regions of Brazil

*Franciele Marques Redigolo*¹

*Fernanda Kelly Menezes Gonçalves*²

*Stela Andrade Vasconcelos*³

*Cecília Abrahão Nascimento de Santi*⁴

*Mariângela Spotti Lopes Fujita*⁵

ABSTRACT: Self-archiving policies in institutional repositories aim to ensure that the deposit of files of scientific, administrative, or artistic production is made consistent with the contents, ensuring standardization of the necessary data. This study aims to investigate the use of self-archiving scientific papers in institutional repositories of universities in the Southern and Southeastern regions of Brazil. The study focused especially on the guidelines regarding subject representation while self-archiving for keyword assignment and the use of controlled vocabularies by researchers. The descriptive-exploratory research used a qualitative-quantitative approach to conduct documentary research. From the list of IBICT's Brazilian repositories and the Ministry of Education Portal, a survey was

¹ São Paulo State University - UNESP - Marília, Brazil.

E-mail: marques.redigolo@unesp.br | ORCID ID: <https://orcid.org/0000-0001-6277-2960>

² Federal University of Pará - UFPA - Belém, Brazil.

E-mail: kellyfernanda0215@gmail.com | ORCID ID: <https://orcid.org/0000-0001-6374-8276>

³ Federal University of Pará - UFPA - Belém, Brazil.

E-mail: stelavascncelos@gmail.com | ORCID ID: <https://orcid.org/0000-0003-1154-3089>

⁴ Federal University of Pará - UFPA - Belém, Brazil.

E-mail: ceciliabrahao2001@gmail.com | ORCID ID: <https://orcid.org/0000-0002-8070-2023>

⁵ São Paulo State University - UNESP- Marília, Brazil.

E-mail: mariangela.fujita@unesp.br | ORCID ID: <https://orcid.org/0000-0002-8239-7114>

<https://doi.org/10.36311/2025.978-65-5954-624-4.p523-544>

conducted focused on federal universities of the Southern and Southeastern regions of Brazil. The survey identified repositories that had self-archiving policies and which of them provided guidelines for depositing papers on the platform and used controlled vocabulary to choose the descriptors. The findings showed a total of 27 institutions: 18 have self-archiving policies, among which 07 are repositories in the Southern region and 11 repositories from the Southeastern region. Based on the findings, the study concluded that a significant number of Brazilian institutional repositories had self-archiving policies, however, some repositories still need improvements in the self-archiving guidelines, focusing on information representation and retrieval.

KEYWORDS: Self-archiving, Indexing policies, Institutional repositories – Brazil.

INTRODUCTION

Society has evolved in creating and disseminating information, from its origins using drawings and symbols to the modern digital age. This evolution of communication has witnessed several historical events, including the periodical crisis of the 1980s, which significantly altered the methods of storing and disseminating research.

During this period, concerns emerged due to the substantial volume of articles and the delays in their reviews. This situation was exacerbated by the fact that journals, which were then primarily print-based, charged for publications. There was a pronounced discrepancy between the quantity of published material and the needs of the users. Consequently, it became essential to explore solutions to address this issue (Mueller, 2006; Amorim Neto, 2013).

In 1990, the emergence of the ArXiv electronic system marked a pivotal change in the landscape of scientific dissemination. It offered a platform for researchers to submit their preprints to a repository, enabling peers interested in the topic to access them easily. This type of scientific documentation significantly transformed the way of disseminating scientific knowledge and enhanced the autonomy of researchers. The advent of ArXiv also spurred the study of various technological aspects related to scientific communication and information sharing (Mueller, 2006; Oliveira, 2005).

Self-archiving in university Institutional Repositories (IRs) is a reflection of historical events and the evolution of Information and Communication Technologies. These IRs stand out as means of organizing and disseminating research and academic productions, and for this reason, there is a strong incentive for public universities to establish their repositories, promoting self-archiving for the academic community.

However, how do the institutional repositories of federal universities in Brazil guide authors on subject representation for self-archiving? To collaborate in the advancement of discussions on self-archiving in university institutional repositories, this research aims to investigate the use of self-archiving of scientific productions in university IRs at universities in the Southern and Southeastern regions of Brazil, with emphasis on guidelines for researchers on subject representation during self-archiving for assigning keywords and using controlled vocabulary.

INDEXING AND INDEXING POLICIES FOR SELF-ARCHIVING

In response to the challenges that large segments of the population face in accessing scientific information, institutional repositories have emerged as a means to facilitate easier access to academic research. These repositories aim to digitally store and preserve the scientific works of a specific institution, however, the means of disseminating research have undergone a significant evolution until the introduction of this tool.

Driven by the journal crisis due to the high price of subscriptions to scientific journals, the Free Access to Information movement gained encouragement around the world, and in Brazil, it was encouraged by the Brazilian Institute of Information in Science and Technology (IBICT), as reported by Silva (2010).

Based on this, open access institutional repositories managed by university libraries provide support for scientific communication, as it allows researchers to reduce their search time and opens the way for individuals to fully appropriate the desired document. Information users become more dependent, as the act of searching, selecting and retrieving

information in the virtual environment are part of this information behavior (Reis & Zaninelli, 2021).

That said, Institutional Repositories (IRs) are recognized as tools that enhance universities' commitment to promoting research and innovation in Science. The strategies for their creation, dissemination, operation, and maintenance are typically planned by the libraries of these universities.

On the other hand, in addition to the technological aspects that involve the software for implementing the IR, essential policies and elements are also necessary for its maintenance. Leite (2009) states that planning, implementation and community participation are part of the management process and scientific communication. Based on this tripod, managers analyze the software used, the user's informational needs, repository marketing, among other elements that contribute to the development of the tool and the quality of the service.

Costa and Leite (2019, our translation) analyzed IRs in Latin America and found two shortcomings across the systems, “[...] the little formalization of institutional commitment and the low presence of policies.” (p.12). This finding highlights the importance of a self-archiving policy for both the IR organization and the quality validation of IRs. In line, Roy et al. (2022) pointed out the deficiency in the implementation of policies within open access repositories, so that students, publishers and the government could collaborate for the success in retrieving newly available content in these repositories.

Thus, when operational, university repositories provide scholars with a valuable reference for their research. Similarly, society at large gains the ability to access these works at any time, as these repositories are a part of the open access movement. Additionally, numerous factors contribute to the quality of the information service provided, which is why managers need to understand the target audience of the repository and implement strategies and policies that enhance the visibility of the tool and instill confidence in its users.

A policy that can contribute to the visibility of the institutional repository and improve the information service provided by the tool is the

self-archiving policy. The practice of self-archiving began with the open access movement, which gave rise to what science considers as *Green Road*. According to Assis (2013, emphasis added) “*Green Road*, or *Via Verde*, which means the self-archiving of scientific production in open access digital repositories.” (p.214). Santos and Oliveira (2019) draw on various investigations to report that the fields of Library Science and Information Science encourage authors to self-archive their works in free communication and dissemination channels, in addition to subscription publishers.

This activity does not replace publication in publishers or printed periodicals but can be considered complementary to them (Swan, 2005). Self-archiving becomes a relevant tool for the scientific community, as it presents another way of making research available and disseminated via the Web. In addition, self-archiving increases the use and impact of scientific productions, thereby increasing access to research and benefiting researchers, users and institutions (Harnad, 2006).

Furthermore, the Brazilian Institute of Information in Science and Technology (IBICT) makes some recommendations for researchers, based on the Berlin Declaration. IBICT (2005) highlights that:

[...] B. It is **essential** that **researchers** (authors):

1. contribute to increasing content in institutional or thematic repositories, depositing as many of their works as possible, whether published or not, including pre-post prints, class material, when applicable and other materials.
2. obligatorily deposit publications involving research results financed with public resources in a free access repository [...]. (p.1, our translation).

Within these recommendations, the importance of research being published by Green Road is reinforced, especially research carried out with public resources, just as research at public universities should be freely accessible as “[...] from an ethical point of view, the results of these research should be freely accessible.” (Kuramoto, 2006, p.92, our translation).

It is recognized that institutions should provide support to both librarians and authors to optimize the functioning of repositories. For

librarians, this support involves assistance in developing the indexing policy, while for authors, it pertains to guidance through the self-archiving policy. Such measures aim to enhance the indexing of documents stored in repositories, which, in turn, improves information retrieval (Al-Maskari & Sanderson, 2010), assessed based on factors such as system efficiency, user efficiency, and user characteristics.

Indexing, an ancient practice in Librarianship, consists of representing documents by subject, which can be carried out manually or by automated systems (Lancaster, 2003; Shah, 2015). This activity involves assigning keywords to identify the content of the document, facilitating its retrieval in libraries or databases.

It is therefore understood that the indexing process is an integral part of the thematic treatment of information in libraries, involving key concepts such as exhaustiveness and specificity, which significantly influence the efficiency of information retrieval (Garcia & Redigolo, 2020).

Carneiro (1985, emphasis added) points out three fundamental factors to consider when developing a policy: i. the institution where the indexing will be carried out; ii. the target audience; iii. financial resources. Such aspects will influence policy planning, as they can provide data on users' interests in a given area and the institution's financial costs. Consequently, there will be an efficient and economical indexing policy about the institution's costs and time of user.

The literature also recommends the indexing policy follow the policy of an information retrieval system, as this ends up influencing the indexing process (Rubi & Fujita, 2003). Therefore, the indexing policy must complement the operating policy of institutional repositories that allow self-archiving, for example.

The indexing process involves information organization, treatment and storage, requiring training of the personnel who perform these activities. Tolare and Fujita (2021) argue that, “[...] although the indexing policy establishes guidelines that assist in this process, decision-making involves subjective aspects that permeate life experience, psychological profiles and

mental structures, which are responsible for obtaining a different result in the performance of the function.” (p.21).

Numerous factors guide indexers in making appropriate decisions about the materials they store, both subjective and objective elements, which should be incorporated into the institution’s indexing policy as this inclusion will assist indexers in their work, prompting them to consider the best strategies for the users’ needs.

Tartarotti (2014) emphasizes the importance of discussing skills within a theoretical-methodological context, arguing that this dialogue will optimize the thematic treatment of information. The author also notes that the process of subject indexing and cataloging is influenced by factors such as the indexing policy and the educational background of the indexer as subject analysis is an activity inherently characterized by variations. Furthermore, Narendra (2015) lists the development phases of the librarian as a data analyst, including the ability to collect information, discuss data, analyze activities and visualize studies. Thus, skills revolve around cognitive, interpretative activities that often involve new information and communication technologies.

Indexing is recognized as a longstanding practice among librarians, encompassing the processes of selection, organization, analysis, and storage of information across various document formats. To achieve standardization and quality in information services, a librarian/indexer needs to adhere to an indexing policy, which provides guidelines for coherent and consistent work. Similarly, the self-archiving policy in institutional repositories plays a crucial role. This policy aims to guide researchers on the self-deposit of documents, both the indexing policy and the self-archiving policy are fundamental for ensuring effective and accurate documentary representation.

METHODOLOGY

In order to investigate the use of self-archiving scientific productions in university IRs of universities in the Southern and Southeastern regions

of Brazil, focusing on the guidelines for assigning keywords and use of controlled vocabulary, this research has a exploratory character, and also documentary, as it investigates the self-archiving policies of institutional repositories at federal universities.

Initially, bibliographical research was carried out on the topics studied. Next, a qualitative-quantitative approach was adopted, seeking to quantify the research findings through analysis of 18 self-archiving policies, through categories of analysis.

Firstly, to search the Institutional Repositories of federal universities in the Southern and Southeastern regions of Brazil, the IBICT's List of Brazilian Repositories was used, containing 108 repositories. The study identified 27 institutional repositories from the Southern and Southeastern regions of Brazil (Chart 1), which served as the corpus of this research.

Those Institutional Repositories that met at least one of the conditions were subject to analysis: 1. electronic address in full operation, 2. offered self-archiving, 3. had indexing policies and/or guidelines for depositing authors' intellectual productions. In a second phase, to broaden the scope of the research, the Ministry of Education (MEC) Portal on courses and institutions was also used, as there might be institutions listed on the MEC Portal that were not included in the IBICT's List of Brazilian Repositories. Therefore, five other federal universities and their respective Institutional Repositories in operation were added to analyze the results. It is important to highlight that the Federal University of Santa Catarina (UFSC) has two RIs, RI-UFSC, which is the university's general repository and the Vitor Marinho repository, specific to the Sports Center on the Florianópolis campus. Both were considered eligible for analysis.

However, it is noteworthy that the IRs of the Federal University of Triângulo Mineiro (UFTM), the Federal University of Alfenas (UNIFAL) and the Federal University of São João del-Rei (UFSJ) were not included in the analysis data set, as they are under construction.

It is worth mentioning that the Federal University of ABC (UFABC) was not included in the analysis corpus for two reasons: the Institutional Repository could only be accessed locally, preventing it from being analyzed

remotely, and its other Research Data Repository was not consistent with the research objectives. Furthermore, state and private institutions were disregarded to meet the research objectives.

As a result, 26 Higher Education Institutions (HEIs) were identified with their respective IRs in operation, 11 federal universities in the Southern region and 15 federal universities in the Southeastern region. It is noteworthy that UFSC has 2 repositories, as shown in Table 1.

Table 1: Institutional Repositories from the Southern and Southeastern regions

Region	Institution	Repository	Website
South	Federal University of Fronteira do Sul (UFFS)	RD/UFFS	https://rd.uffs.edu.br/
	Federal University of Latin American Integration (UNILA)	RIUNILA	https://portal.unila.edu.br/biblioteca/repositorio-institucional
	Federal University of Health Sciences of Porto Alegre (UFCSPA)	RI-UFCSPA	https://repositorio.ufcspa.edu.br/
	Federal University of Pelotas (UFPel)	GUAIACA	http://guaiaca.ufpel.edu.br/
	Federal University of Santa Catarina (UFSC)	RIUFSC	http://repositorio.ufsc.br/
		Vitor Marinho	https://repositorio.ufsc.br/handle/123456789/127359
	Federal University of Santa Maria (UFSM)	MANANCIAL/	https://repositorio.ufsm.br/
	Federal University of Paraná (UFPR)	RDI-UFPR	https://bibliotecas.ufpr.br/repositorio/
	Federal University of Rio Grande (FURG)	RI-FURG	http://repositorio.furg.br/
	Federal University of Rio Grande do Sul (UFRGS)	LUME	https://lume.ufrgs.br/
	Federal Technological University of Paraná (UTFPR)	RIUT	http://repositorio.utfpr.edu.br/jspui/
	Federal University of Pampa (UNIPAMPA)	RIU	https://dspace.unipampa.edu.br/

Southeast	Federal University of Itajubá (UNIFEI)	RIUNIFEI	https://repositorio.unifei.edu.br/xmlui/
	Federal University of Juiz de Fora (UFJF)	RI-UFJF	https://repositorio.ufjf.br/jspui/
	Federal University of Lavras (UFLA)	RIUFLA	http://repositorio.ufla.br/
	Federal University of Minas Gerais (UFMG)	RI UFMG	https://repositorio.ufmg.br/
	Federal University of Ouro Preto (UFOP)	RIUFOP	http://www.repositorio.ufop.br/
	Federal University of São Carlos (UFSCar)	Lisa RI UFSCar	https://repositorio.ufscar.br/
	Federal University of São Paulo (UNIFESP)	RI UNIFESP	https://repositorio.unifesp.br/
	Federal University of Uberlândia (UFU)	RI-UFU	https://repositorio.ufu.br/?locale=pt_BR
	Federal University of Viçosa (UFV)	LOCUS UFV	https://www.locus.ufv.br/handle/123456789/1
	Federal University of Espírito Santo (UFES)	RIUFES	https://repositorio.ufes.br/home
	Federal University of the State of Rio de Janeiro (UNIRIO)	HÓRUS	https://www.unirio.br/bibliotecacentral/horus
	Federal University of Rio de Janeiro (UFRJ)	PANTHEON	https://pantheon.ufrj.br/
	Federal University of the Jequitinhonha and Mucuri Valleys (UFVJM)	R.I UFVJM	http://acervo.ufvjm.edu.br/jspui/
	Fluminense Federal University (UFF)	RIUFF	https://app.uff.br/riuff/

The Institutional Repositories websites were visited in search of files related to self-archiving and guidance for researchers. E-mails were sent to the universities' central libraries for information on the progress and composition of the IRs sites under construction. In response, the Central Library of the Federal University of Triângulo Mineiro informed that the Institutional Repository had not been instructed yet, and the Central Library of the Federal University of Alfenas informed that the repository is still under development and is expected to go into production next year. There was no response to the email sent to the Central Library of the Federal University of São João del-Rei.

The analysis of the Institutional Repositories websites that make up the research sample allowed the identification of 18 self-archiving policies, which were discussed in four categories of analysis. These categories were created based on empirical data collected in this first analysis of Institutional Repositories to search for self-archiving guidelines: 1) Self-archiving function in Institutional Repositories of federal universities; 2) Self-archiving policy, investigating its presence and availability in repositories; 3) Guidelines with print screen images, checking if there are visual guidelines for storage; 4) Keyword assignment and use of controlled vocabulary, analyzing instructions for keyword assignment in policies for self-archiving papers in repositories.

Table 2: Categories of analysis

Categories	Purpose of analysis
Self-archiving function	Analyze which and how many Institutional Repositories provide the self-archiving function to the user, divided by Southern and Southeastern regions
Self-archiving policy	Examines which and how many Institutional Repositories provide access to their Self-archiving Policies, divided by Southern and Southeastern regions, in addition to examining the document's format on the IR website.
Guidelines with print screen images	Evaluate policies or other documents that represent them, searching guidelines with prints and guidance for the users on storing papers in the Institutional Repository, divided by Southern and Southeastern regions

Keyword Assignment and Use of Vocabulary	Investigates the content of the guidelines for self-archiving, pointing to the use or not of controlled vocabularies, divided by region and Institutional Repositories. Also, check the guidelines available in IR for assigning keywords.
--	--

Initially, the survey was carried out between June and July, 2020, and was conducted again in July 2022 and October 2023 to verify new data on the Institutional Repositories and their respective self-archiving policies and guidelines. Findings are discussed in the following session.

RESULTS AND DISCUSSION

To meet the objectives of this research, the analysis of the self-archiving function, the self-archiving policy, guidelines with images and keyword assignment was carried out in the 27 Institutional Repositories, distributed in 12 IRs in the Southern region and 15 in the Southeastern region.

Category: Self-archiving function

In this category, IRs that offer the self-archiving function were found, specifically seven from the Southern region and 11 from the Southeastern region. Furthermore, it was observed that nine IRs did not have the self-archiving function, five from the Southern region and four from the Southeastern region.

This analysis shows that 66.7% of the institutional repositories investigated in this research have the self-archiving option. For Veiga and Macena (2015), institutions must encourage and understand the importance of giving researchers autonomy to archive their research, thus resulting in the prosperity of the self-archiving function.

The following category shows the number of institutional repositories that have a self-archiving policy.

Category: During the survey of the policy

In this analysis, it was found that the 18 IRs that have a self-archiving function also have self-archiving policies, seven from the Southern region and 11 from the Southeastern region. This category shows that nine IRs do not have self-archiving policies, five from the Southern region and four from the Southeastern region.

Policies play a fundamental role in the self-archiving process, as they will influence document representation and retrieval. For Carneiro (1985), some points should be considered for efficient policies: 1. identifying the institution to which the indexing system will be linked; 2. identifying the target audience the system is aimed at; 3. financial resources.

During the survey of the policy, it became clear that the self-archiving policy serves as a guideline to ensure the secure deposit of papers. Another point about the policies noted in the universities researched is that some policies are identified with different nomenclatures (ordinance, deposit policy) rather than “Self-archiving policy”. However, regardless of the terminology used, all documents highlight the importance of self-archiving in IRs.

The next category covers institutional repositories that have guidelines for the self-archiving process using prints.

Category: Guidelines with print screen images

In this category, we discuss repositories that provide manuals and policies with print screen images of the guidelines for self-archiving. In total, 11 guidelines with images were found, considering the two regions studied.

The Southern region has five institutional repositories that provide guidelines with images. They are: UNILA Institutional Repository, GUAIACA Institutional Repository, UFSC Institutional Repository, FURG Institutional Repository, and the UNIPAMPA Institutional Repository.

Using images in guidelines facilitates understanding the self-archiving rules. The practice aims to increase the number of documents in the repository and contributes to open access to scientific information. Assis (2013) states that institutions must offer support and training materials for author-researchers. Therefore, the guidelines with images meet the needs of authors regarding the deposit of papers and seek to ensure greater adherence to the archiving process.

Regarding the retrieved guidelines, UNILA Institutional Repository has a tutorial with self-archiving guidelines for the academic community. GUAIACA/UFPel also has a metadata standardization policy, which guides users on filling out the metadata fields and what relevant information needs to be included on the document at the time of deposit.

UFSC Institutional Repository provides an instruction manual for submitting final course papers. The manual guides the author from logging into the platform to describing the document's data. FURG Institutional Repository does not have guidelines for self-archiving in the repository itself, however, there is a manual for self-archiving in the digital library of theses and dissertations. UNIPAMPA Institutional Repository guides logging into the platform, choosing a collection and filling out the fields using the repository's metadata policy.

The Southeastern region had 06 institutional repositories with guidelines with images: UFLA Institutional Repository, UFMG Institutional Repository, UNIFESP Institutional Repository, UFU Institutional Repository, UFVJM Institutional Repository, UFF Institutional Repository.

UFLA Institutional Repository has an instruction document for using the repository, which reports on the organization of communities and collections, and how the author should perform the submission. UFMG Institutional also has a self-archiving tutorial, which, in addition to guiding submitting academic work, also instructs on how to standardize it according to the institution's guidelines.

UNIFESP Institutional Repository provides several guidelines with images for self-archiving final papers, theses and dissertations, scientific

articles, and a general tutorial for depositing documents. UFU Institutional Repository, in addition to making the self-archiving tutorial available in PDF, organizes a playlist on YouTube with video guidelines in a more dynamic way that facilitates visualization of the submission process.

The UFVJM Institutional Repository also provides a PDF document that not only guides submitting academic work but also provides instructions on filling out the metadata on the platform. UFF Institutional Repository has an instrument identified as a basic tutorial using images to guide self-archiving by authors.

At this moment, with library automation, metadata is part of the indexing and self-archiving process. Thus, repositories that provide policies or tutorials for filling out metadata can ensure that subject representation is carried out by authors with higher quality, and the representation will have more control if it uses controlled vocabulary.

Of the repositories with guidelines on self-archiving, it is noteworthy that only 05 repositories did not have guidelines with images but were guided through written language on the self-deposit of the document or the indication for the author to deliver the document to the library in charge. These specific cases occurred with the following repositories: UTFPR Institutional Repository, UFJF Institutional Repository, UFSCar Institutional Repository, LOCUS UFV Institutional Repository, and UFRJ Pantheon Repository.

Guidelines with images can facilitate self-archiving and ensure that documents are deposited according to the standards of institutional repositories, serving as support material for authors. Furthermore, metadata policies can be a complementary instrument to indexing policies and self-archiving tutorials, as they also aim to standardize and access quality information.

The next category covers guidelines for self-archiving and use of controlled vocabularies.

Category: Keyword assignment and use of controlled vocabulary

In this category, the presence of guidelines for assigning keywords and the use of controlled vocabulary was examined in eight repositories in the Southern and Southeastern regions. The guidelines were presented in separate tables (Tables 3 and 4).

The use of controlled vocabulary in the analyzed IRs refers to the act of representing a document appropriately through specific terms, aiming to enable efficient content retrieval by the user.

Table 3: Guidelines for assigning keywords and the use of controlled vocabulary in institutional repositories: Southern region

Institutional Repository	Guidelines for Assigning Keywords	Controlled vocabulary
UNILA RI	“Describe the keywords used to describe the theme of the academic work”	No
GUAIACA/UFPel	“Each keyword must be registered in a field, starting with the first letter in capital letters; Enter keywords in all languages; When necessary, use general terms, together with specific or related terms, register them in the same field, separating them by a hyphen (e.g.: Philosophy – Study and teaching). Use Pergamum’s registry of authorities to adjust keywords, as they need to be controlled; Search the terms in the Pergamum Network Subject Terminology Catalog.”	Yes. Pergamum Network Subject Terminology Catalog.
UFSC IR	“Inform each keyword of the work individually, in Portuguese, and click on “Add”, if there is in another language, include it too, a maximum of 5 (five) keywords for each language.”	No
UNIPAMPA IR	“Each keyword must be registered in a field, starting with the first letter in capital letters; Enter keywords in all languages; When necessary, use general terms, together with specific or related terms, register them in the same field, separating them with a hyphen (e.g.: Primates – Marmosets). Try to use the keywords used by the authors as long as they are terms preferably registered in the National Library. Search the terms in the BN Subject Terminology Catalog”	Yes. National Library Subject Terminology Catalog.

Among the 11 institutional repositories in the Southern region of Brazil, four of them provided guidelines for the use of keywords, while two of them also used controlled vocabulary. UNILA IR does not use controlled vocabulary but has a form authors must fill out and submit on the platform. In this form, the guideline is that the author uses the same keywords that appear in the academic work that will be deposited.

Likewise, UFSC IR informs about the addition of keywords on the platform. The repository does not use controlled vocabularies but guides on some points that authors should consider, such as: not using articles and prepositions in keywords, inserting compound words and words with hyphens as one, using the plural and singular in terms, adding keywords in another language, and using a maximum of five keywords. These guidelines are crucial for representing the information contained in the works accurately and faithfully. They also play a significant role in facilitating the retrieval and access of these papers by other users.

GUAIACA/UFPel has a metadata standardization policy for theses, dissertations and scientific articles. The policy guides the use of Pergamum Network terms as they need to be controlled. Still regarding the inclusion of keywords, GUAIACA/UFPel recommends inserting a general term together with a specific or related term, when necessary. Similarly to GUAIACA/UFPel, UNIPAMPA IR also provides a metadata policy and provides the same guidelines on general and specific terms, and insertion in other languages. The difference is that UNIPAMPA IR uses the National Library controlled vocabulary.

Thus, in a study on subject attribution guidelines in theses and dissertations, Fujita and Panuto (2024) observed that keywords are like the identity of a research, they serve as a “map” of the indexed study, hence the importance of guidelines using controlled vocabulary to represent the subject accurately and cohesively.

Table 4: Guidelines for assigning keywords and the use of controlled vocabulary in institutional repositories: Southeastern region

Institutional Repository	Guidelines for Assigning Keywords	Controlled Vocabulary
UFLA IR	“Subject: The terms used as keywords will be used in indexing the document. Therefore, the more faithful the content is, the greater the likelihood that users and readers will find the document in future searches on UFLA IR. Assign the terms necessary to describe your document, being as specific as possible within the scope of the subject. The level of specificity in indexing should align with the content of the text. Use one field per term, to add more fields, click on [...]. Indexing terms should be used in the singular form, except in instances where they cannot be described as such. Capitalize only the initial letter of the term and its specifier. Proper names should adhere to capitalization rules. If specifiers are necessary, their inclusion should be formatted as follows: main subject, space, dash, space, specifier. Avoid using periods.”	No
UFSCar IR	“Keywords: Enter the keywords in Portuguese and foreign language. Capitalize only the initial words and acronyms. For each keyword entered, click the Add button. Attention: Enter keywords in all languages in this field. Enter each keyword individually. Do not enter words in sequence, separated by a comma, semicolon or period.”	No
UFU IR	“In Keywords, one keyword should be entered per field, as in the example. The words in Portuguese, in the foreign language of the abstract and foreign language abstract and of the catalog card should be included without the word Theses [...]”	No
UFVJM IR	“Capitalize only the first word of the keyword, according to spelling rules (FIG. 8). Enter each keyword in one field, without period.”	No

Of the 15 institutional repositories in the Southeast region of Brazil, four IRs presented guidelines for filling in the keywords for self-deposit. However, even though the guidelines served as a guide, none of the four used controlled vocabularies.

UFLA RI guides the use of terms that are faithful to the content, and that are specific to the subject of the work, this way, other users will find it easier to retrieve the work. The repository gives preference to terms in the singular form, except in specific cases. This demonstrates that UFLA

RI has control over subject representation made by authors, aiming at standardizing the digital collection and offering easy access for readers.

UFSCar, UFU and UFVJM Institutional Repositories do not use controlled vocabularies either, but each has its guidelines for the use of keywords. For example, using capital letters only in the first letter of the term, also inserting terms in a foreign language, and inserting each keyword separately, without using commas or semicolons.

Therefore, repositories must provide self-archiving guidelines, as the depositing might be unfamiliar to authors. While indexing is typically performed by librarians, authors assigning terms to their work can align the vocabulary more closely with that of other users, reflecting their realities and their needs (Freitas et al., 2021). Conversely, vocabulary control is necessary for organizing the digital collection and standardizing terms, which can range from general to specific. Through these guidelines, quality information is provided to the user community.

FINAL CONSIDERATIONS

From the above, it is highlighted that self-archiving in University Institutional Repositories is a consequence of historical facts such as the evolution of Information and Communication Technologies. Therefore, its promotion with the use of self-archiving, when operating, provides scholars with an alternative for making their research available and disseminated through Open Access.

In this study, in response to the way the institutional repositories of federal universities in Brazil guide authors on subject representation for self-archiving, an analysis was carried out of the number of federal public universities that have Institutional Repositories, also investigating the indexing policies adopted by these institutions to enable a more accurate self-archiving process.

Aiming at investigating the use of self-archiving scientific productions with guidelines for assigning keywords and the use of controlled vocabularies, the research analyzed 27 institutional repositories.

It was possible to identify that 18 repositories provided the self-archiving function with a self-archiving policy. Regarding the use of print screen images to guide users to self-deposit, 11 institutional repositories used this method. Also, 02 institutional repositories used controlled vocabulary to assist users in subject representation through appropriate terms.

In view of the above, the investigation highlighted a quantitative survey of IRs in the Southern and Southeastern regions of Brazil that have the self-archiving function and their self-archiving policies. From that, it can be concluded that institutional repositories are adhering to the idea of the policies, however, there are still several 09 IRs that can develop and make self-archiving policies available through the creation of a responsible committee.

From this research, more generally, it is understood that providing studies to provide researchers with adequate guidance on keyword assignment and the use of controlled vocabulary when self-archiving their work in IRs is essential. Not only do these practices ensure an accurate and effective representation of their research, but they also facilitate dissemination and access by others in the academic community. Consequently, researchers must adhere to established guidelines to ensure that their work is represented in a manner that enhances its accessibility and maximizes its intended impact.

REFERENCES

Al-Maskari, A., & Sanderson, M. (2010). A Review of factors influencing user satisfaction in information retrieval. *Journal of the American Society for Information Science and Technology*, 61(5), 859-868. <https://doi-org.ez3.periodicos.capes.gov.br/10.1002/asi.21300>

Amorim Neto, M. R. (2013). *Organização do conhecimento na Ciência da Informação: uma análise métrica nos periódicos brasileiros (1972-2012)* [Dissertação de mestrado, Instituto de Artes e Comunicação Social, Universidade Federal Fluminense].

Assis, T. B. (2013). Análise de políticas de autoarquivamento nos repositórios institucionais brasileiros e portugueses. *InCID: Revista Ciência da Informação e Documentação*, 4(nesp.2), 212-227. <http://www.revistas.usp.br/incid/article/view/69329>

Carneiro, M. V. (1985). Diretrizes para uma política de indexação. *Revista da Escola de Biblioteconomia da UFMG*, 14(2), 221-241. <http://hdl.handle.net/20.500.11959/brapci/73170>

Costa, M. P., & Leite, F. C. L. (2019). Open access institutional repositories in Latin America. *Biblios: Journal of Librarianship and Information Science*, 74, 1-14. <https://biblios.pitt.edu/ojs/index.php/biblios/article/view/328/356>

Freitas, M. P. de, Dal'Evedove, P. R., & Tartarotti, R. C. D. (2021). Políticas de autoarquivamento em repositórios institucionais brasileiros: estudo analítico do metadado assunto. *Páginas a&b: Arquivos e bibliotecas*, (nsp.) 169-175. <https://ojs.letras.up.pt/index.php/paginasab/article/view/10245>

Fujita, M. S. L., & Panuto, J. C. (2024). Diretrizes para atribuição de temas de teses e dissertações em repositórios. *Revista IFLA*, 50(1), 160-169. <https://doi-org.ez3.periodicos.capes.gov.br/10.1177/03400352231217275>

Garcia, V. C., & Redigolo, F. M. (2020). Indexação e recuperação da informação. *Tendências da Pesquisa Brasileira em Ciência da Informação*, 13(1), 1-20. <http://hdl.handle.net/20.500.11959/brapci/159385>

Harnad, S. (2006). Optimizing OA Self-Archiving Mandates: What? Where? When? Why? How?. *Open Access Archivangelism*. Disponível em: <https://eprints.soton.ac.uk/263098/1/arch.html>. Acesso em: 14 out. 2024.

Instituto Brasileiro de Informação em Ciência e Tecnologia. (2005). *Manifesto brasileiro de apoio ao acesso livre à informação científica*. IBICT. livroaberto.ibict.br/Manifesto.pdf

Kuramoto, H. (2006). Informação científica: proposta de um novo modelo para o Brasil. *Ciência da Informação*, 35(2), 91-102. <https://doi.org/10.1590/S0100-19652006000200010>

Lancaster, F. W. (2003). *Indexação e resumos: teoria e prática* (2a ed.). Briquet de Lemos. <https://bibliotextos.files.wordpress.com/2014/07/livro-indexacao-e-resumos-teoria-e-pratica-lancaster.pdf>

Leite, F. C. L. (2009). *Como gerenciar e ampliar a visibilidade da informação científica brasileira: repositórios institucionais de acesso aberto*. Brasília: IBICT. https://repositorio.unb.br/bitstream/10482/4841/1/LIVRO_ComoAmpliarGerenciar.pdf

Mueller, S. P. M. (2006). A comunicação científica e o movimento de acesso livre ao conhecimento. *Ciência da Informação*, 35(2), 27-38. <https://doi.org/10.18225/ci.inf..v35i2.1138>

Narendra, A. P. (2015). *Big data, data analyst, and improving the competence of librarian*. In: *International Conference on Record and Library: Reinventing Information Professionals*. Surabaya, Indonesia. http://fv.conference.unair.ac.id/wp-content/uploads/2018/01/Icrl_2015.pdf#page=9

Oliveira, E. C. P. (2005). *Grau de adesão à comunicação científica de base eletrônica: estudo do caso da área de Genética* [Tese de doutorado, Escola de Comunicação, Universidade Federal do Rio de Janeiro / IBICT].

Reis, S. G., & Zaninelli, T. B. (2021). Uma análise em torno do repositório institucional como recurso informacional de acesso aberto. *Ponto de Acesso*, 14(1), 117-137. <https://periodicos.ufba.br/index.php/revistaici/article/view/29094>

Roy, B. K., Biswas, S. C., & Mukhopadhyay, P. (2022). Archiving policies in institutional digital repositories: a global scenario. *International Journal of Information Science and Management*, 20(2), 102-126. <https://dorl.net/dor/20.10.01.1.20088302.2022.20.2.7.2>

Rubi, M. P., & Fujita, M. S. L. (2003). Elementos de política de indexação em manuais de indexação de sistemas de informação especializados. *Perspectiva em Ciência da Informação*, 8(1), 66-77. <http://hdl.handle.net/20.500.11959/brapci/38387>

Santos, S. R. O., & Oliveira, D. A. (2019). Autoarquivamento na ciência da informação: uma análise dos documentos depositados no repositório digital e-lis. *Múltiplos Olhares em Ciência da Informação*, 9(2). <http://hdl.handle.net/20.500.11959/brapci/137056>

Silva, L. H. G. (2010). *As políticas dos repositórios institucionais: conteúdo, acesso, preservação, metadados e submissão/autoarquivamento*. [Trabalho de conclusão de curso, Universidade Federal de Santa Catarina].

Shah, N. S. (2015). Review of indexing techniques applied in information retrieval. *Pakistan Journal of Engineering, Technology & Science*, 5(1), 27-47. <https://core.ac.uk/download/pdf/268591603.pdf>

Swan, A. (2005). Open-access self-archiving: an introduction. *Key Perspectives*, Reino Unido (UK). <http://eprints.soton.ac.uk/261006/>

Tartarotti, R. C. D. (2014). *Atuação bibliotecária no tratamento temático da informação em unidades de informação: estudo comparativo qualitativo*. [Dissertação de mestrado, Universidade Federal de São Carlos].

Tolare, J. B., & Fujita, M. S. L. (2021). A competência informacional do bibliotecário no processo de indexação. *Revista Brasileira de Biblioteconomia e Documentação*, 17, 1-25. <http://hdl.handle.net/20.500.11959/brapci/162515>

Veiga, V., & Macena, L. G. (2015). O autoarquivamento nos repositórios institucionais brasileiros: um estudo exploratório. *Ponto de Acesso*, 9(3), 35-47. <https://periodicos.ufba.br/index.php/revistaici/article/view/15107>

Analysis of indexing language in Covid-19 subject representation

*Maria Carolina Andrade e Cruz*¹

*Jessica Beatriz Tolare*²

*Mariângela Spotti Lopes Fujita*³

ABSTRACT: The study aims to investigate how indexing languages and databases represent the subject Covid-19. The proposal involves analyzing the representative terms available in different languages and comparing them with the subject categories in databases, based on retrieval of the topic. As a methodology, the research is characterized as qualitative and exploratory with a comparative method. The first part of the research involved conducting searches for the topic Covid-19 in databases and the second one in indexing languages. Databases that had subject categories were used as criteria: Global Index Medicus (6,895 results), Unesp (1,138 results), Library of Congress (13,256 results), Publications office of the European Union (542,515 results) and LILACS (15,333 results), in the period between 2020-2023. The selected languages were: Health Sciences Descriptors/Medical Subject Headings, the European Union Controlled Vocabulary and the Library of Congress Subject Headings. The study found that the terms defined by indexing languages have a specificity that may not be suitable for databases; they differ in the sense that subject categories do not present a systematic hierarchical order based on the central subject, they are generic and retrieve several papers with themes that are not exclusive to the health area, whereas indexing languages present a logical sequence and greater specificity of the researched topic.

KEYWORDS: Indexing language. Covid-19. Subject representation.

¹ São Paulo State University (Unesp), Brazil.

E-mail: maria.andrade@unesp.br | ORCID ID: <https://orcid.org/0000-0001-8307-3448>

² São Paulo State University (Unesp), Brazil.

E-mail: jessica.tolare@unesp.br | ORCID ID: <https://orcid.org/0000-0002-8637-7989>

³ São Paulo State University (Unesp), Brazil.

E-mail: mariangela.fujita@unesp.br | ORCID ID: <https://orcid.org/0000-0002-8239-7114>

<https://doi.org/10.36311/2025.978-65-5954-624-4.p545-572>

INTRODUCTION

In mid-2019, a disease caused by a previously unidentified virus emerged. The Coronavirus, or Covid-19, as it was denominated, had its first major outbreak reported in the city of Wuhan, China, from where it spread to several countries. The proliferation of the virus is believed to have occurred due to the sale of wild animals and seafood in a densely populated market where some people began exhibiting severe respiratory symptoms (Wu et al., 2020).

In addition to the pandemic, inequality in access to information, to health and to the possibility of prevention increased. In parallel, some governments discredited the seriousness of the disease, influencing thousands of people not to take precautions and to doubt Science. These attitudes were specifically aimed at not combating the Coronavirus. Given this scenario, the search for a medical solution was essential for people's survival; and the role of information professionals was also intensified in the mission to treat newly discovered information and make it available in an efficient and secure way (Fernandes et al., 2021).

Thus, many renowned scientific content providers have mobilized to make research results available on their platforms free of charge to combat Coronavirus, such as Elsevier, Oxford, Wiley, BMJ, Nature, Sage, Emerald, Cambridge and others (Ali & Bhatti, 2020). The databases of these scientific content providers are scientific dissemination tools, which use quality criteria in the assessment of their indexed journals and were used as a complement in the fight against disinformation, in this pandemic scenario.

In the same way, indexing languages contribute to information representation and retrieval. To this end, the tools need to be in line with the informational resources, with the indexing policy of the environment, and with the needs of the community. Indexing languages need constant maintenance and updating so that subject indexing can be specific enough to represent the features of current topics, such as Covid-19.

Considering the fundamental role of scientific databases and indexing languages in organizing information representation, especially with regard to the proposed theme Covid-19, we sought to investigate how

the subject “Covid-19” is treated in the subject categories of the databases and in indexing languages. This term was chosen because it is common among the terms authorized in indexing languages when referring to the virus and the pandemic, as will be verified in the course of this research. The proposal consists of analyzing the representative terms available in different languages and comparing them with the subject categories assigned in databases, based on the search and retrieval of the topic in order to investigate deeper into the importance and influence they have to be accessible to the population.

THEORETICAL FRAMEWORK

One of the main objectives of researchers and the scientific community is to make their research results visible by publishing in scientific journals. Databases, especially the most competitive ones, use quality criteria to disseminate these papers, serving as an important factor in the visibility and dissemination of researchers and scientific journals. Furthermore, they present bibliometric data to evaluate various aspects of scientific production, depending on their scope.

To achieve these goals, a preliminary step should be taken: the organization and representation of these scientifically relevant publications using tools specifically developed to support and assist in this demand. According to Hjørland and Gnoli (2016), the process of knowledge organization involves classification, indexing, and Knowledge Organization Systems (KOS), which are used in the selection of concepts based on the subject analysis of informational resources, with indications of the semantic relationships among these concepts. These systems can include classification systems, subject heading lists, thesauri, and others. They may also be understood as indexing languages, a term used in this study synonymous with KOS (Fujita et al., 2018).

As observed in the studies by Fujita et al. (2018) and Barité (2011), other terms are used in the literature to describe these tools for organizing and representing information, which result from terminological variations and theoretical currents. This paper does not intend to compile these

variations present in each theoretical current, but rather to highlight the term used in this study, “indexing language,” which stems from the Anglo-Saxon tradition and whose concept aligns with what we propose, following the definition presented by the researchers below.

According to Mazzochi (2018), indexing languages are responsible for the storage and retrieval of documents. More specifically, Gollub (2011) defines indexing languages as “[...] a specific kind of controlled vocabularies representing formalized languages designed and used to describe the subject content of documents for the information retrieval purposes.”

Therefore, in Information Organization and Representation, in particular the indexing process, artificially constructed specialized languages are used to represent, in a standardized way, the concepts contained in documents. Dahlberg (1978) introduces that efforts should be made so that this type of language competently defines the concepts of documents and seek precision in the process. Specialized languages, also referred to here as indexing languages, promote vocabulary control and information organization and representation.

Indexing languages are tools to be used in two moments: during the indexing process and when users search in library catalogs, institutional repositories, digital collections, databases and any other system from which they wish to find information. In this regard, Sarkhel (2017) adds that language should meet three purposes: (i) represent the thematic content of documents; (ii) organize a searchable collection; (iii) and represent the thematic content of user queries during searches. The author believes that an indexing language is effective when there is a match between the way the indexer represents the content and the terms users use in searches. This effectiveness depends on several factors, including the way the collection is organized, the language used, the indexing policy and user awareness.

It is noteworthy that indexing languages are not considered inflexible tools, as they should follow technological, scientific and social advances, and, therefore, require the maintenance and updating of the terms within their composition. This is a considerable fundamental point for document representation, with current topics and their retrieval on the agenda.

International standards establish criteria for the construction and maintenance of indexing languages, such as thesaurus. Two of the most current standards stand out here: American National Standards Institute/ National Information Standards (ANSI/NISO) Z39.19 (R2010) and International Standardization Organization (ISO) 25694 (2011, 2013), the latter is the most recent standard published on this subject.

The two guidelines are introduced in this paper as they address important and complementary definitions of the presented concepts, without being mutually exclusive. The ANSI/NISO Z39.19 (R2010) focuses on vocabulary control, while ISO (25964) focus on the management of the construction and maintenance of thesauri in its first part, and in the second, on the issue of interoperability with other types of vocabulary.

ANSI/NISO Z39.19 (2010) defines indexing language as:

A controlled vocabulary or classification system and the rules for its application. An indexing language is used for the representation of concepts dealt with in documents [content objects] and for the retrieval of such documents [content objects] from an information storage and retrieval systems. (p.6).

Indexing terms are used to describe the content of information objects based on the intellectual process involved in indexing. The assignment of these indexing terms is derived from an indexing language (ISO 25964-1, 2011).

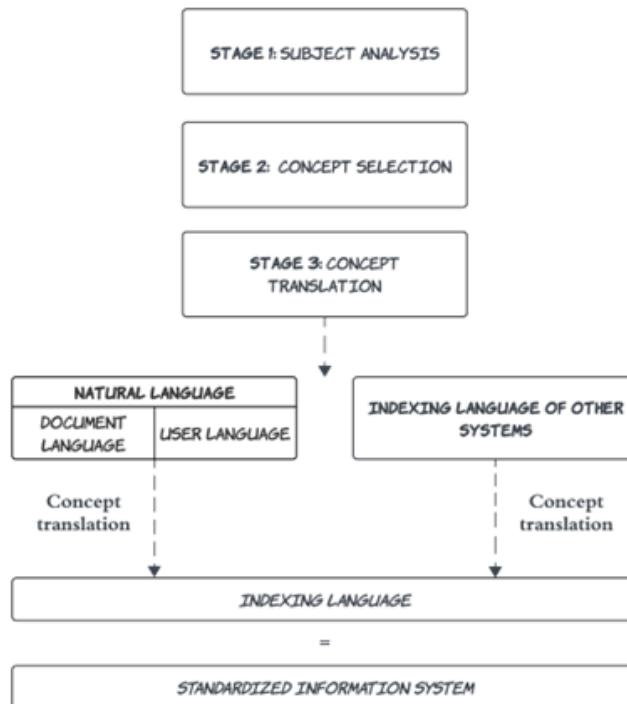
While Sarkhel (2017) points out that the indexing language is an artificially constructed language, composed of expressions which connect several representative terms, its function is to organize semantic content and provide access points for those seeking information, unlike natural language, which can cause obstacles in conceptual representation. The concepts absorb the standard description established by the indexing language and the indexer is responsible for expressing them through terms representative of the extracted essence.

Determining a term to represent a specific concept means establishing vocabulary control, since a single concept can be described in different ways

using different terms (ISO 25964, 2011). Indexing languages aim for this control to avoid discrepancies and misunderstandings in the description of concepts.

Cruz (2017) presents a diagram in Figure 1 to show the use of indexing language within an information system.

Figure 1: Use of indexing language in an information system



Source: Cruz (2017, p.25).

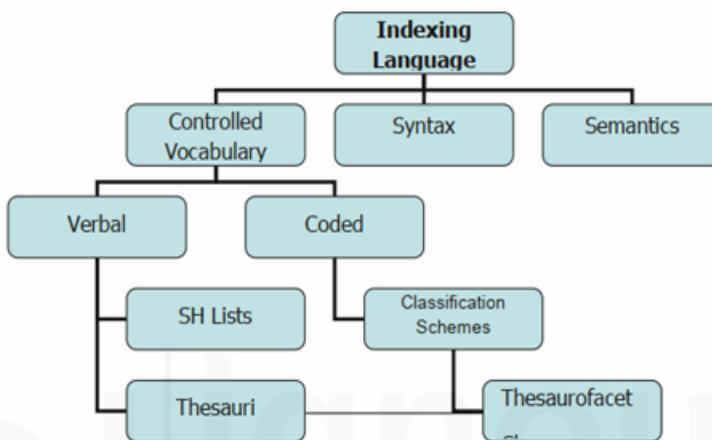
According to Figure 1, the indexing process is divided into its three main stages: subject analysis, concept selection and translation. The indexing language is characterized in the third stage of concept translation. According to the author, the librarian needs to deal with language variables such as: users' language and documents' language, both expressed in

natural language; and other systems' language. The author points out that indexing consistency will depend on the decision of which indexing language will be used, one built by the institution itself or one already published, consolidated and available for consultation.

During the selection or development of an indexing language for integration into a system, the institution should prioritize and scrutinize its quality. Therefore, the institution should observe the composition and development of the structure, semantic and syntactic relationships of the selected language.

Indexing languages, according to Pinto (1985), are made up of vocabulary and syntax. Vocabulary includes the relationship of terms to identify the thematic content of documents, while syntax refers to the rules designed to combine terms, aiming at representing the thematic content of documents. In this sense, Sarkhel (2017) developed a small diagram to show the indexing language structural composition (Figure 2).

Figure 2: Structure of the indexing language



Source: Sarkhel (2017).

Figure 2 shows the structure of the indexing language. For Sarkhel (2017), it consists of three elements: (i) controlled vocabulary; (ii) syntax; and (iii) semantics. Controlled Vocabulary aims to ensure the relationship between systematically structured terms, which can be verbal (subject heading lists and thesauri) or codified (classification schemes). Syntax refers to a set of rules or grammar that will govern the sequence of words, whether in subject headings or classification notations. It will provide a pattern of relationships, which is recognized between the terms used in the system. And semantics addresses the systematic study of how meaning is structured, expressed and understood in the use of indexing language. Various types of semantic relationships occur, such as equivalence, hierarchical and associative relationships (Sarkhel, 2017).

The indexing language has attributes that play an important role in the effective organization of the inserted collection. For Sarkhel (2017), they are: vocabulary control used to standardize representative terms; coordination of concepts, in which the indexer finds the essence of the document; multiple access; syndetic devices, which is an organizational structure to which related subjects are linked in an underlying classificatory structure; manifestation of relationships to interconnect the terms that make up the language and show the degree of relationship; and structural presentation, so that the structure of the language visibly illustrates the semantic network of concepts and their relationship.

The indexing language is composed as an array of specialized tools for information treatment (Lara, 2004). Pedraza-Jiménez et al. (2009) and Vállez et al. (2015) explain that this allows the use of various tools, including thesauri, taxonomies, ontologies, and lists of authorities, among others.

In Figure 3, ANSI/NISO Z39.19 standard (2010, p.101) presents some types of indexing languages, which are characterized by their degree of complexity in vocabulary control processes.

Figure 3: Structural complexity of controlled vocabularies

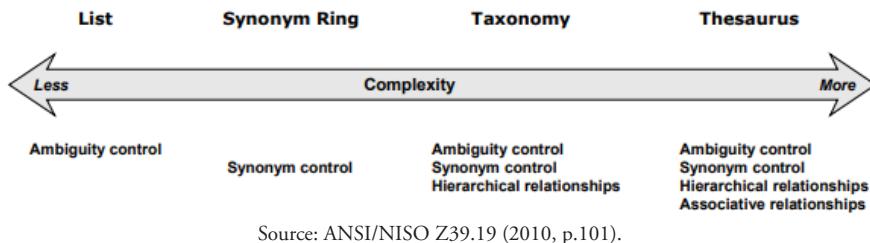


Figure 3 shows the complexity presented in the structure of controlled vocabularies, according to the ANSI/NISO Z39.19 (2010) standard, from the lowest to the highest degree. Starting from the left to the right, with List that has Ambiguity control, and with Synonym Ring, both have the lowest degree of complexity to control vocabulary. Followed by Taxonomy, with Ambiguity and Synonym Control and Hierarchical Relationships. Thesaurus had one of the greatest complexities, as it addresses Ambiguity and Synonym Control and Hierarchical and Associative relationships.

Regarding semantic relationships, ISO 25964 (2011) also establishes the existence of three types of relationships: (i) hierarchical, in which concepts are presented according to the classificatory order. In this type, there is a correlation between subjects originating from a main class or category, followed by specific and subordinate terms. Hierarchical relationships can be characterized by the acronyms Broader Term (BT) and Narrower Term (NT); (ii) associative, which refers to the association between terms and may or may not have the same meaning. This category aims to relate the terms defined by the language with the term used in the search by the user, and the following acronym can be used to represent Related Terms (RT); and (iii) equivalence, relate to terms with equivalent meanings, though represented by different expressions. In this category, cross-references, non-preferred terms are also established. Their function is to direct the user to preferred terms, based on the term used in the search. The acronyms used for this type of relationship are USE/UF+.

These technical decisions need to be defined according to the planning of the tool and the physical and/or digital collection to be represented. The relationships in indexing languages operate like gears that connect concepts, allowing a logical and systematic understanding by those responsible for maintaining them, as well as users and indexers. This ensures that the indexing language is coherent and effective, facilitating information retrieval and navigation through the contents of the collection.

During the indexing process, indexers can choose the concepts they believe best represent the subject of the document, its essence. Then, they perform a query in the established language to check whether there is a match between the concept chosen by the indexer and the selection of the term that will represent it in the catalog. In this context, some scenarios may arise, such as: (i) the chosen concept matches the defined term; (ii) the chosen concept does not match the defined term, therefore, the term from the indexing language should be used to standardize; (iii) introduction of a new and significant concept; this process ensures that the indexing language remains relevant and comprehensive, according to reality (Tolare, 2021). Fujita et. al. (2018, our translation) adds by explaining that the indexing language serves as a “Commutative code between different linguistic perspectives involved in the documentary system: user, indexer and system, being the main components to obtain the representation and retrieval of adequate information.” (p.224).

In addition to well-developed indexing languages, effective systems, and highly qualified professionals, users also play a crucial role in conducting searches. Therefore, there has been discussion about users' information literacy when seeking information from high-quality and reliable sources. Rocha (2022) explains that information literacy is an ability to search, assess and locate the desired information. However, the author emphasizes that if information representation is not solid, even more experienced users will not be able to retrieve information, as the search terms will not correspond to the indexed terms. That said, the fundamental political role played by information professionals is highlighted in promoting tools capable of keeping up with the advances and needs of humanity. This role also corresponds to that of scientific databases. Dantas, in 2002, reported that

in “current” society “information plays a vital role and has great political and economic value. Now, information is considered an economic good or commodity,” considering that databases often serve large corporations or institutions focused on an expertise.

According to Franciscatto (2019), databases are essential for the dissemination of consistent and relevant work. When indexed in a database, especially in an established one, these papers are endowed with credibility and recognition of the quality of that scientific research. Therefore, databases are another element that favors scientific production and knowledge dissemination.

RESEARCH METHODS AND OBJECTIVES

This research is characterized as qualitative and exploratory. To achieve its objectives, the study was divided into: (i) search and retrieval of the theme Covid-19 in databases and indexing languages; and (ii) comparative analysis of the subject categories of the databases and terms of retrieved indexing languages.

SEARCH AND RETRIEVAL OF THE THEME “COVID-19” IN DATABASES AND INDEXING LANGUAGES

Before carrying out the searches, the following databases were selected: Global Index Medicus (GIM), as it encompasses publications from all continents; Library of Congress (LC), as it is a database of significant value, which has the power to influence other systems; Publications Office of the European Union, as it encompasses publications from the entire European continent; Latin American and Caribbean Literature in Health Sciences (LILACS), as it is specific to the health area; and the service management systems of São Paulo State University (Unesp), as it has an integrated search with publication from CAPES Periodical Portal, and the university’s Institutional Repository and Digital Library.

At first, the databases were chosen as they are specifically of the health field and have a significant global influence. The lesser-known

databases were considered for being outside the expected standards as they offer perspectives that help contribute to the analysis.

The aim was for the analysis to encompass all continents, so search systems and databases representing them were chosen: one from Europe, one from North America, one from South and Central America, primarily because the authors are Brazilian, and another more general database with publications from Africa and Asia. Therefore, we could achieve more comprehensive coverage, observing the focus of the publications retrieved in each result.

The criteria used for their selection consisted of: (i) being focused on the health area, encompassing public health and biomedicine, as they are subareas focused on studying the protection of people's health and the study of microorganisms, respectively, and have the skills to develop research on Covid-19 and its impact on the population (GIM, LILACS); (ii) presenting publications with global coverage (GIM, LC, Publications Office of the European Union, LILACS); and (iii) making publications available to users free of charge, making them more accessible. Unesp database was selected as it presents publications from the Brazilian territory, with scientific publications developed by professors, students and researchers belonging to São Paulo State University, and it shows an overview of the reality of the impact of Covid-19 in the country. The links for accessing them are available in chart 1.

Chart 1: Links to access the databases

Selected databases	Access links
Global Index Medicus (GIM)	https://www.globalindexmedicus.net/
Library of Congress (LC)	https://www.loc.gov/
Publications Office of the European Union	https://op.europa.eu/en/home
Latin American and Caribbean Health Sciences Literature (LILACS)	https://lilacs.bvsalud.org/
São Paulo State University (Unesp)	https://unesp.primo.exlibrisgroup.com/discovery/search?vid=55UNESP_INST:UNESP

Source: by the authors

GIM database provides access to world literature, focusing on subareas such as public health and biomedicine, which were produced by low-middle income countries. The Library of Congress is considered one of the largest existing libraries, which has a vast collection and provides access to information on a global scale, while the Publications Office of the European Union has publications from countries that are part of the European Union members. LILACS database is specialized in the health area, with scientific and technical literature from more than 26 countries in Latin America and the Caribbean and with free access. Unesp database has an integrated service of a network of the institution's libraries, which provides access to the physical collection, the bases subscribed by the university, the content available on the CAPES Periodicals Portal, the repository and the institution's digital library, with a scientific research production developed by the entire body of students, teachers and researchers.

Indexing languages were also selected for the study as they are constructed artificially, through procedures and aiming at controlling vocabulary, enabling access and ensuring information retrieval. Among them, the following languages were selected for the research: Health Sciences Descriptors and Medical Headings (DeCS/MeSH); European Union controlled vocabulary; Library of Congress Subject Headings (LCSH); and the Macrostructure of the Global Index Medicus itself.

Initially, the criteria for selecting these languages were based on their specialization in the area of health and presenting specific language (Health Sciences Descriptors and Medical Headings - DeCS/MeSH and Global Index Medicus). However, LCSH and the European Union Controlled Vocabulary were also selected due to their importance for global coverage and their ability to influence the development of other systems in other countries. The indexing languages were accessed through Unesp, with free access for all users.

Chart 2: Links to access indexing languages

Indexing Languages	Access Links
DeCS/MeSH	https://decs.bvsalud.org/
European Union Controlled Vocabulary	https://op.europa.eu/pt/web/eu-vocabularies/thesauri
LCSH	https://www.loc.gov/aba/publications/FreeLCSH/freelcsh.html
GIM Macrostructure	https://pesquisa.bvsalud.org/gim/decsocator/?output=site&lang=en&from=0&sort=&format=summary&count= 20&fb=&page=1&index=tw&q=%22Covid-19%22

Source: by the authors

DeCS/MeSH is a thesaurus intended to serve as a single language for indexing different materials (articles, books, technical reports, etc.) and to be used in research and retrieval of scientific literature subjects in different information sources (Virtual Health Library, LILACS and MEDLINE). The European Union Controlled Vocabulary is made up of alignments (interoperability projects and tasks in databases); ATTO tables (used to manage different types of tags such as metadata, editorial and graphical user interface content); authority tables and code lists (both were defined to harmonize and standardize codes and labels used by Publication Services and in interinstitutional data exchange); taxonomies (have a unique hierarchical structure and show different types of relationships such as parent/child); and thesaurus (composed of Digital Europa Thesaurus – DET, ECLAS and EuroVoc, intended to represent concepts through representative terms and present their relationships). LCSH is a subject authority database, which encompasses personal names, company titles, meeting or conference titles, uniform titles, general subject titles and specific subjects, such as geographic.

ANALYSIS OF DATABASE SUBJECT CATEGORIES AND INDEXING LANGUAGE TERMS

To carry out searches in the selected databases and indexing languages, the term “Covid-19” was used, with a delimited period from

2020 to 2023. This term was chosen as it is the most commonly used among its variations.

From the obtained results, the existence of information that made up “Main subject” or the equivalent in the search refinement area was observed. They aimed at filtering publications by their subjects assigned by the database, as observed in Figure 4. Therefore, to analyze the research, we chose to incorporate this refinement in the sampling, as it allows us to investigate these subjects, the similarities and differences with the term Covid-19 and with the representative terms present in indexing languages. To use in the analysis, we named this sampling as “Subject Categories”. These categories can generally be found on the left or right side of the database interface.

Figure 4: Example of subject categories

The screenshot shows the Global Index Medicus search interface. The search bar at the top contains the query "Covid-19". Below the search bar, the results are displayed, showing 20 results out of 33,494. The results are ordered by relevance. The first result is a study titled "Impact of COVID-19 social distancing recommendations on pulmonary function, nutritional status, and morbidity in patients with cystic fibrosis / Impacto das recomendações de distanciamento social por COVID-19 sobre a função pulmonar, estado nutricional e morbidade em pacientes com fibrose cística". The second result is a study titled "Enhancing understanding of SARS-CoV-2 infection among individuals with Down syndrome: An integrative review". The third result is a study titled "Drug use among medical students in São Paulo, Brazil: a cross-sectional study during the coronavirus disease 2019 pandemic". The fourth result is a study titled "Effects of physical exercise on mood and sleep quality of college". On the left side, there is a sidebar titled "Main subject" which lists various categories including COVID-19, Coronavirus infections, Pandemics, Pneumonia, Viral, Betacoronavirus, SARS-CoV-2, Coronavirus, Mental Health, and Health Personnel. The "Main subject" section is highlighted with a yellow border.

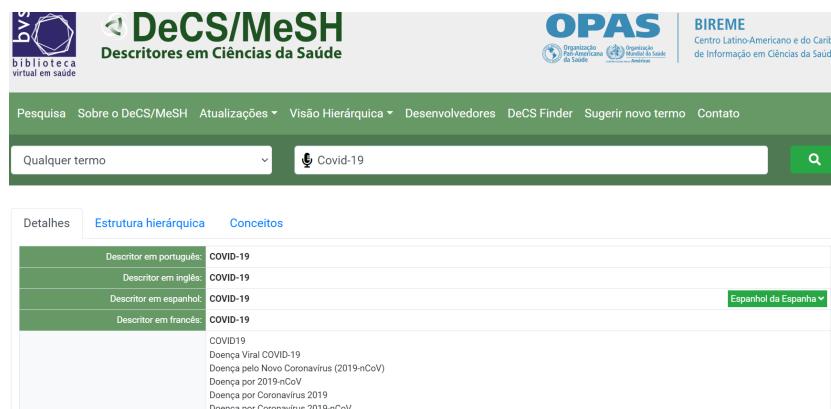
Source: by the authors

These subject categories show the publications assigned to each subject. There is no explicit information about how this process occurs within the

selected databases. However, through it, refining the search and finding even more specific research, as required by the user's needs, is possible. From these, the study established that the first 50 subject categories would be selected, as they occur in descending order, starting from the largest to the smallest number of studies assigned to a subject category.

While indexing languages present different dynamics on their platforms, for the analysis, the chosen terms were those that made up the field “Entry term(s)”, as they address specific terms, and users can start the search by them or are redirected to them. An example of the search performed by the selected term in the indexing language is shown in Figure 5.

Figure 5: Example of searching the term covid-19 in indexing language



The screenshot shows the DeCS/MeSH indexing language search results for the term 'covid-19'. The interface includes the DeCS/MeSH logo, a search bar with the term 'Covid-19', and a results table with columns for Portuguese, English, Spanish, and French descriptors. The results are as follows:

Descriptor em português	COVID-19
Descriptor em inglês	COVID-19
Descriptor em espanhol	COVID-19
Descriptor em francês	COVID-19

Below the table, a detailed view shows the term 'COVID19' with its subterms: Doença Viral COVID-19, Doença pelo Novo Coronavírus (2019-nCoV), Doença por 2019-nCoV, Doença por Coronavírus 2019, and Doença por Coronavírus 2019-nCoV. A green box highlights 'Espanhol de Espanha'.

Source: https://decs.bvsalud.org/ths/resource/?id=59585&filter=ths_termall&q=covid-19

The example shown in Figure 5 presents the results of the search using the term Covid-19 in the DeCS/MeSH indexing language. It can be observed in its details, in the form of a hierarchical tree structure and through its concepts. This type of structured language enables the analysis of the relationships between different types of representative terms, which originate from a central theme. Its construction took place through

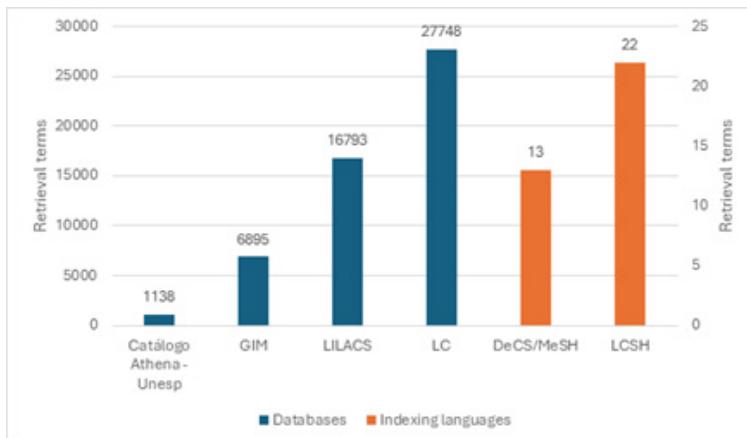
specialist professionals to ensure that the information has an adequate representation and effective retrieval during searches.

FINDINGS AND DISCUSSION

The findings are initially presented by the subject categories found in the databases and subsequently, the results found in the analyzed indexing languages.

Some of the analyzed systems present “subject categories” in their search results, which are also described as “keywords”, “subjects” or “main subject”. These categories are generated from the works that make up the base, where they are grouped by similar themes. The results were organized from the first 50 terms in order of assigned results, in other words, from the categories with the most assigned research to the categories with the fewest studies, carried out manually in a ranking table, created in word.

Graph 1: Terms retrieved from databases and indexing languages



Source: by the authors

The graph shows the number of terms retrieved from databases and indexing languages. In total, 52,574 terms were retrieved in the databases,

of which 27,748 were from LC, followed by LILACS with 16,793. The smallest number is from GIM with 6,895 and Catalog Athena - Unesp with 1,138. In indexing languages, a total of 35 terms were retrieved, divided into DeCS/MeSH (13) and LCSH (22).

Next, the data found in the two defined areas will be presented and discussed: the databases and the indexing languages.

DATABASES

Global Index Medicus database retrieved 6,895 results with the term Covid-19, including publications of papers presented at conferences, articles, theses and dissertations. Publications Office of the European Union database includes documents retrieved from laws, rights, publications, summaries of legislation, web pages and the official EU contact list. The Latin American and Caribbean Literature in Health Sciences database, retrieved 16,793 papers. All available formats were considered at the Library of Congress (LC), both online and printed. The search for the term “Covid-19” retrieved 27,748 results. Initially, all the searches were generally conducted in all fields. The results were then filtered by subject.

The analyzed databases presented different results in relation to the most incident subject categories. It was noted that in the Publications Office of the European Union and in the Global Index Medicus, the most common category of results was not the term properly defined for the search, Covid-19, but rather “EU Member State” and “Coronavirus”, respectively.

Data from the Publications Office of the European Union refer to documents published by European Union entities. Therefore, they present decisions, reports and communications carried out by the European Communities and the European Union; these results were publications on the Coronavirus. In the Global Index, the most frequently found results stand out for the categories that involve: health consequences of the virus (pneumonia, coronavirus infection, Severe Acute Respiratory Syndrome, respiratory issues, mortality, etc.), public health decisions (Public Policy,

Unified Health System, Quarantine, Public Health, Social Isolation, Personal Protective Equipment), human behavior in the face of the pandemic (Mental Health, Occupational Health, Social Behavior, Stress, Psychological, Social Work), studies on the virus (Betacoronavirus, SARS-CoV-2, Coronavirus) and medical procedures (Nursing, Primary Health Care, Pediatrics, Thorax, Aged, Patient-to Professional, hospitalization).

Unesp is a public university and its collection covers all areas of knowledge. Regarding the theme Covid-19, the category presenting the highest number of publications was entitled Covid-19, with papers published by professors and students at the University. However, we found that the subject categories also identified a high incidence of topics focused on technology (Artificial Intelligence, Application Software, Computer Networks, Computer Communication Networks, Computers, Software Engineering, etc.). We suggest that this result showed the efforts of areas other than health to contribute to the migration of the teaching environment that needed to happen, from physical to digital. Universities, as well as several private companies, schools and other institutions needed to invest in technologies to continue operating remotely. Adetayo (2023) emphasizes that before the COVID-19 pandemic, emerging countries widely used traditional research teaching methods in their university libraries. Subsequently, they were forced to quickly find new ways to continue operating and serving both the scientific community and the general population through online education. This work of training and continuous guidance to researchers is understood as crucial for enabling researchers to access the desired information. We highlight here the use of databases and indexing languages, which are elements that information professionals should be familiar with to assist in the process of organizing and retrieving information.

Lilacs presents categories consistent with the profile of its database, which is specifically focused on health, presents subject categories for topics such as: health consequences resulting from the virus (Coronavirus Infections, Viral Pneumonia, Severe Acute Respiratory Syndrome, Neoplasms), studies on the virus (Betacoronavirus, SARS-CoV-2, Coronavirus), public health policies (Social Isolation, Contingency

Plans, Personal Protective Equipment, Immunization Programs, Physical Distancing), hospital action measures (Epidemiological Monitoring, Intensive Care Units, Primary Health Care, Nursing Care, Biological Risk Containment), however, one of the subject categories that stood out in relation to other databases was “Telemedicine”, which became a reality and allowed to serve people regardless of their location. Lilacs is considered to be similar to the Global Index Medicus, despite GIM database is not exclusive to a single area. It is noteworthy that Lilacs and Global Index Medicus use DeCs/MeSh as their indexing language, which may contribute to their similarity in subject categories, even if the indexing language and subject categories are distinct elements. According to Lancaster (2004), satisfactory search results in databases can be considered “useful” and “relevant” when they meet the user’s needs. This can be linked to the categories of subject with exhaustive indexing, as pointed out by the author. Similarly, GIM uses a criterion of comprehensiveness in its subject categories to encompass more papers on a specific topic, while Lilacs uses them more specifically to meet the needs of health researchers more pertinently. Issues such as exhaustiveness and specificity in indexing should be defined in an indexing policy when belonging to an information system (Lancaster, 2004; Fujita et al., 2016), comprehensiveness in the coverage of concepts laid out in the structure of indexing language (ISO 25694-1, 2011). Here, we can associate these same aspects with the criterion of comprehensiveness used by each database.

Library of Congress retrieved a large number of works with the proposed central theme and the presence of categories that address American cities and the country itself was perceived as a factor that distinguishes it from other databases (United States, New York (State), Bronx, Queens, Brooklyn, Manhattan), the way in which this period of human history was portrayed (Digital Photographs, Time Lapse: Covid-19, Blogs, Fashions, Newspapers, Portraits), in addition to the government measures and laws taken to combat the virus (Face Masks, Law, Law Library, Government, Legal Notice).

INDEXING LANGUAGES

The selected indexing languages were: Health Sciences Descriptors / Medical Subject Headings (DeCs/Mesh); the European Union Controlled Vocabulary - EU VOCABULARIES; and the Library of Congress Subject Headings (LCSH). In DeCs/MeSH, the search for the term Covid-19 retrieved 13 results. However, the results showed that the preferred term has 60 cross-references with terms considered to be alternative or non-preferred which have no vocabulary control.

In the indexing language of the Library of Congress Subject Headings, 22 results were found and the term closest to the one searched was Covid-19 (Disease) with nine cross references. Research carried out in the European Union Controlled Vocabulary - EU VOCABULARIES demonstrates that its structure only presents two cross-referenced terms.

In the analysis of indexing languages, the study found that DeCs/ MeSh retrieved 13 results that addressed Covid-19, with LCSH bringing 22 results in the search. As expected, DeCs/MeSh brought specific descriptors from the health area (Serological Test for COVID-19, Acute Post-COVID-19 Syndrome, Serotherapy for COVID-19, ChAdOx1 nCoV 19) and in the term “Covid-19”, it presented 60 cross-references. This is to standardize all the terms that have emerged to address the same subject. The importance of a tool such as an indexing language that directs both the indexer and the user when choosing the ideal term for their representation and/or search is thereby observed. Cruz and Fujita (2021) highlight that making the indexing language available to the user can contribute to information retrieval by allowing for the development of a search strategy that is more coherent with each database used. This approach ensures that the terms used in indexing and searching are consistent.

LCSH addressed more social and comprehensive themes in its structure (COVID-19 Pandemic, 2020- , in art; COVID-19 (Disease) (Islamic law); COVID-19 Pandemic, 2020- , in motion pictures; COVID-19 Pandemic, 2020- , in mass media, COVID-19 Pandemic, 2020- , in popular culture; COVID-19 Pandemic, 2020- , in literature). This is due to the fact that LCSH is not a specialized indexing language

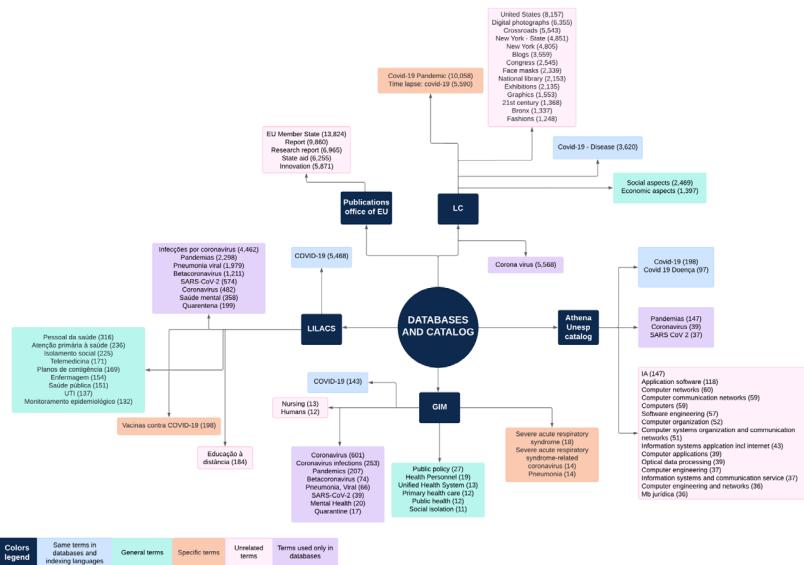
in one area of knowledge, but seeks to serve other types of information resources. The proposed descriptor “Covid 19” had 9 cross-references that presented related terms written differently, considered synonymous (Coronavirus disease-19, SARS coronavirus 2 disease, SARS CoV-2 disease).

In EU VOCABULARIES, the term Covid-19 is in a structure with three general terms attached to it “infectious disease; illness; health policy” and with only two cross references: “NextGenerationEU” and “recovery from the coronavirus pandemic”, demonstrating that it is not an indexing language that brings specificity to areas related to health, but rather focused on the social aspect.

Therefore, subject categories differ from indexing languages, especially if we conduct a thematic approach as in this research. When analyzing the theme Covid-19, we noticed that subject categories do not present a systematic hierarchical order based on the central subject. Several papers with related themes are retrieved, but not necessarily in the health area, such as in indexing languages that present specificity of the researched topic and relate the variations of the term, represented by the cross-references and standardizing them in a single descriptor.

Chart 3 is a diagram that presents a list of broader and narrower terms that are unrelated or that were only assigned by databases or indexing languages.

Chart 3: Results in databases and indexing languages



Source: by authors.

The scheme in Chart 3 shows how the terms are related in databases and indexing languages. Each color corresponds to a different category, such as broader or narrower terms; unrelated terms; terms that were assigned only by databases or indexing languages; and the terms that were assigned by databases and indexing languages.

The term “Covid-19” was the only one assigned by both indexing languages and databases. Furthermore, the broader terms are related to the health area, such as “Social isolation” or “Public policy”, while the narrower terms, in orange, are directly linked to the term “Covid-19”. Most of the terms assigned by the databases are unrelated terms, such as “Software engineering”, “Computers” or “blogs”, which demonstrates a certain concern regarding the quality of the assignment of subject categories and keywords in the studies. Furthermore, the terms defined by the indexing languages have a specificity that may not be suitable for databases specific to the health area due to the lack of coverage corresponding to what the specificity of the area requires. In parallel, it is relevant to reflect on the

coverage of terms assigned by these languages, such as “Coronavirus-19 Disease”. Such reflection can extend to how these terms are reused by information units such as libraries to thematically represent their collection.

The indexing language used by Global Index Medicus is DeCs/ MeSh, which is available for user query in the Institution’s online catalog.

CONCLUSION

As highlighted in the introduction, indexing languages require periodic maintenance to remain updated so that subject indexing can accurately represent specific topics, such as “Covid-19” in this case. The research problem consisted of investigating how the term is treated within the subject categories and indexing languages analyzed. We concluded that the subject categories presented in the database interfaces have distinct characteristics: they are comprehensive, where there is no intention to specify the subject; they are linked to subjects not evidently related to Covid-19 and the health field; and there are more specific categories that directly address issues related to the researched subject. These subject categories function as a resource for categorizing databases to gather documents. However, they are not tools that adhere to a specific policy or are used in a subject analysis process, such as indexing. They are developed and made available to act merely as search filters.

Indexing languages adhere to the purpose defined by their responsible institution, and the databases that utilize them are aware of the area in which each language operates, as well as its degree of specificity and coverage of topics. This can be observed in the results from the LCSH when searching for the term “Covid-19”, which yields general terms compared to DeCS/MeSH, a language specialized in Health Sciences, and which includes numerous cross-references (60) to describe the concept of Covid-19. EU VOCABULARIES, despite presenting the chosen term, brought a more political and social bias. Again, this reflects the purpose of each indexing language and its objectives in representation

We can consider that the research proposal, to analyze the representative terms available in different languages, such as in English and Portuguese, and to compare them with the subject categories assigned in databases, was specific within the scope of studies on indexing languages, subject representation, and information retrieval. This is because the investigation aimed not only at one information organization tool but at two: indexing languages, developed with a solid, predefined purpose used for indexing and information retrieval, and subject categories, used as a resource for grouping common documents. Additionally, we noticed that both have different roles within information organization. Indexing languages seek to standardize the terms used both in the representation and in the search strategy for valuable information for users. Subject categories comprehensively bring together how a subject is related to others through a qualitative perspective of the works indexed in the database. The topic Covid-19 was chosen precisely because of its importance for the health area and for public and governmental interests.

With that, Libraries and information systems play a fundamental role in building scientific knowledge through information processing. The role of librarians as indexers is politically necessary to combat misinformation through adequate representation of informational content. Indexing languages and databases are part of this gear in the precise representation of informational resources. Therefore, it is evident that databases are rich information environments that require the functionality of their interfaces, considering a facilitative aspect in website navigation, with the organization of information present within them and the use of consistent indexing languages to coherently represent the subject addressed in the types of documents provided by each one.

Reflecting on the emergence of new threatening diseases and the technological evolution we have been witnessing, we consider that although we are currently transitioning to new technologies, such as the progressive establishment of artificial intelligence (AI) which can significantly contribute to the information organization and representation in information systems, such as databases, this does not eliminate the need for the improvement of indexing languages through their constant

updating. This is especially true as we are at the beginning of a new technology that is not yet widely known or available to everyone.

During the Covid-19 pandemic, it became evident that the tools managing and providing information, along with scientific databases and information systems, are key elements in combating misinformation and can be crucial for the success of research that significantly impacts human life. The topic of Covid-19 was chosen due to its importance to the health area, as well as public and governmental interests. Therefore, this study aims to convey the scope of the tools that establish vocabulary control and their usability in databases. Through the use of subject cross-references, it is possible to group the most commonly used terms to describe a single concept, thus avoiding discrepancies in search results and facilitating the researcher's work.

On this matter, it is important to emphasize the role of information professionals in empowering their users about the use of available resources for navigating and searching their databases, whether through tutorials, asynchronous training, or other methods. Information representation, as an area of interest and dedication in the organization of information, should solidify knowledge and successful practices to evolve and enhance information systems.

REFERENCES

Adetayo, A. J. (2023). Post Covid-19 pandemic and library users' education: Impact on examination and survey. *The Journal of Academic Librarianship*, 49, 102695. <https://doi.org/10.1016/j.acalib.2023.102695>

Ali, M. Y., & Bhatti, R. (2020). COVID-19 (Coronavirus) pandemic: information sources channels for the public health awareness. *Asia Pacific Journal of Public Health*, 32(4), 168-169. <https://journals.sagepub.com/doi/full/10.1177/1010539520927261>.

American National Standards Institute/National Information Standards Organization – z39.19-2005. (2010). *Guidelines for the construction, format, and management of monolingual controlled vocabularies*. NISO Press.

Barite, M. (2011). Sistemas de organización del conocimiento: una tipología actualizada. *Informação & Informação*, 16(3), 122-139.

Cruz, M. C. A. (2017). *Linguagens de indexação no contexto da política de indexação: estudo em bibliotecas universitárias*. [Trabalho de conclusão de curso]. Faculdade de Filosofia e Ciências, Universidade Estadual Paulista, Marília, SP, Brasil.

Cruz, M. C. A., & Fujita, M. S. L. (2021). O uso de linguagem de indexação por bibliotecas universitárias brasileiras. *Informação & Informação*, 26(1), 2021.

Dahlberg, I. (1978). Teoria do conceito. *Ciência da Informação*, 7(2), 101-107.

Dantas, M. (2002). *A lógica do capital-informação: a fragmentação dos monopólios e a monopolização dos fragmentos num mundo de comunicações globais* (2a ed.). Contraponto.

Fernandes M. R., Freire Junior, A. M., & Souza, A. D. (2021). Atuação do bibliotecário clínico em tempos de pandemia da covid-19. *Revista Brasileira de Biblioteconomia e Documentação*, 17, 1-20.

Franciscatto, R. (2019). *Base de dados científica*. Prof. Dr. Roberto Franciscatto. <https://www.franciscatto.com.br/bases-de-dadoscientificas/#:-:text=Os%20trabalhos%20presentes%20em%20uma,sua%20pr%C3%A1tica%20a%20ser%20desenvolvida>.

Fujita, M. S. L., & Gil Leiva, I. (2016). Avaliação da indexação por meio da recuperação da informação. *Ciência da informação*, 41(1), 50-66.

Fujita, M. S. L., Moreira, W., Santos, L. B. P., Cruz, M. C. A., & Ribas, R. R. de B. (2018). Construction and evaluation of hierarchical structures of indexing languages for online catalogs of libraries: an experience of the São Paulo State University (Unesp). *Knowledge Organization*, 45(3), 220-231.

Fujita, M. S. L., Santos, L. B. P., & Alves, R. V. (2018) ¿Son los lenguajes de indización y documentales sistemas de organización del conocimiento?: Un análisis bardiano de la variación terminológica. *Scire*, 24(2), 23-33.

Golub, K. (2011). *Knowledge Organisation Systems. Technical Foundations*, UK(6). <http://technicalfoundations.ukoln.ac.uk/subject/knowledge-organisation-systems.html>

Hjørland, B., & Gnoli, C. (2016). Knowledge organization. *Knowledge Organization*, 43(6), 475-484. Também disponível em Hjørland, Birger, ed. *ISKO Encyclopedia of Knowledge Organization*, https://www.isko.org/cyclo/knowledge_organization

International Organization for Standardization. (2011). *ISO 25964-1: Information and documentation - Thesauri and interoperability with other vocabularies - part 1: Thesauri for information retrieval*. Genebra.

International Organization for Standardization. (2013). *ISO 25964-2: Information and documentation: Thesauri and interoperability with other vocabularies: Part 2: Interoperability with other vocabularies*. Genebra.

Lancaster, F. W. (2004). *Indexação e resumos: Teoria e prática* (2a ed.). Briquet de Lemos.

Lara, M. L. G. de. (2004). Linguagem documentária e terminologia. *Transinformação*, 16(3), 231-240.

Mazzocchi, F. (2018). Knowledge organization system (KOS). *Knowledge Organization* 45(1), 54-78. <https://www.isko.org/cyclo/kos>

Pedraza-Jiménez, R., Codina, L., & Rovira, C. (2009). Metadatos en la web semántica: lenguajes de marcado para la organización de sistemas de información. In L. Codina, M. C. Marcos, & R. Pedraza-Jiménez (Ed.), *Web semántica y sistemas de información documental* (pp. 13-42). Trea.

Pinto, M. C. M. F. (1985). Análise e representação de assunto em sistemas de recuperação da informação: linguagens de indexação. *Revista da Escola de Biblioteconomia da UFMG*, 14(2), 169-186.

Rocha, F. M. S. (2022). Análise da produção científica sobre competência informacional no contexto da Ciência da Informação no Brasil. *Revista Ibero Americana da Ciência da Informação*, 15(1), 52-75.

Sarkhel, J. (2017). *Indexing languages*. Indira Gandhi National Open University.

Tolare, J. B. (2021). *O uso de linguagem de indexação na representação temática de livros em bibliotecas universitárias: Observação com Protocolo Verbal Individual* [Dissertação de Mestrado]. Faculdade de Filosofia e Ciências, Universidade Estadual Paulista, Marília.

Vállez, M., Pedraza-Jiménez, R., Condia, L., Blanco, S., & Rovira, C. (2015). Updating controlled vocabularies by analysing query logs. *Online Information Review*, 39(7), 870-884.

Wu, A., Peng, Y., Huang, B., Ding, X., Wang, X., Niu, P., Meng, J., Zhaozhong, Z., Zhang, Z., Wang, J., Sheng, J., Quan, L., Xia, Z., Wenjie, T., Cheng, G., & Jiang, T. (2020). Genome composition and divergence of the novel coronavirus (2019-nCoV) Originating in China. *Cell Host & Microbe*, 27(3), 325-328.

Perspectives on preservation in digital libraries in the light of metadata: paths for the sustainability of Luso-Brazilian heritage

*Gabriela Aparecida da Cunha Yamane*¹

*Fabiano Ferreira de Castro*²

*Israel Guerra Yamane*³

ABSTRACT: The curation of rare book collections involves the protection of cultural heritage through methods such as microfilming, reissuing, and digitization. Digitization creates administrative and descriptive metadata, transforming analog data into digital data. Administrative metadata, such as creation dates and formats, are generated automatically, while descriptive metadata-titles, authors, subjects, and keywords-are added later for resource retrieval. How can we ensure the long-term accessibility of digital library metadata, as defined by the World Commission on Environment and Development in 1991? Preservation initiatives and curators of rare collections are coordinating digitization for unified access. For example, the Luso-Brazilian Digital Library integrates collections from the National Libraries of Brazil and Portugal, the National Register of Digital Objects, and the Brazilian Virtual Memory Network. This study aims to investigate the

¹ Federal University of São Carlos, UFSCar, São Carlos, Brazil.
E-mail: gabrielacunha91@gmail.com | ORCID ID: <https://orcid.org/0000-0002-2906-0168>

² Federal University of São Carlos, UFSCar, São Carlos, Brazil.
E-mail: fabianocastro@ufscar.br | ORCID ID: <https://orcid.org/0000-0002-8712-2654>

³ Anhembi Morumbi University, São Paulo, Brazil.
E-mail: isragel@gmail.com | ORCID ID: <https://orcid.org/0000-0003-0585-4809>

alignment of the Luso-Brazilian Digital Library's metadata standards with W3C best practices, preserving metadata in digital collections for the memory and sustainability of the Luso-Brazilian heritage.

KEYWORDS: metadata standards; digital preservation; digital collections

INTRODUCTION

The preservation of and access to cultural heritage, especially in the digital environment, have become constants as historical and cultural legacies are increasingly constituted in digital formats and made available to the public via the Internet. In this scenario, digital libraries are responsible for ensuring the availability and preservation of their collections, prioritizing the dissemination of cultural heritage.

The term “digital library” is defined by Reitz (2004) in the Online Dictionary for Library and Information Science (ODLIS) as: “A library in which a significant portion of the resources are in machine-readable format (as opposed to print or microform) and accessible by computer. Digital content may be stored locally or accessed remotely via computer networks.” (Reitz, 2004).

For the Digital Library Federation (1998),

Digital libraries are organizations that provide the resources, including specialized staff, to select, structure, provide intellectual access to, interpret, distribute, preserve the integrity of, and ensure the longevity of collections of digital works so that they are readily and economically available for use by a defined community or set of communities. (p.1).

In this context, digital libraries consist of digital collections that can be more accurately described as sets of items “[...] converted into machine-readable format for preservation or electronic access.” (Reitz, 2004). This conversion to digital formats is directly related to the idea of digital curation, which involves careful selection, creation of digital objects, and ensuring reliable long-term access, along with the need to make items electronically accessible, which is an essential aspect of digital

curation when preserving and making resources available. According to Reitz (2004), digital curation refers to

[...] active management, enhancement and preservation of trusted digital research data throughout its lifecycle. Digital curation involves verifying the integrity of digital data, selecting trusted digital data for its long-term value, creating digital objects and associated metadata, transferring digital objects to trusted digital repositories for secure storage, providing access to designated users, and periodically re-evaluating digital formats to prevent obsolescence.

For instance, in institutions dedicated to safeguarding cultural heritage with rare collections, the curation mission includes, among other things, policies that cover the content of cultural goods, including the safeguard of the goods through processes of microfilming, reissuing, digitization, description, and availability (Pinheiro, 2015). From this perspective, in which digitization and availability are understood as part of the digital curation process, and in which different types of administrative and descriptive metadata are generated, the transformation of analog information into digital data and information requires ensuring the long-term accessibility of this metadata in digital libraries.

In the model developed for the MoA II testbed project, Hurley et al. (1999) classify metadata into three categories:

- Descriptive metadata: which aims to facilitate the discovery and identification of objects;
- Structural metadata: which provides support for the display and navigation of objects;
- Administrative metadata: which comprises all the essential management information for the object, covering details about the creation process, storage formats, the origin and provenance of the objects, as well as the intellectual property rights associated with them. (p.21).

The authors mention categories that describe the different types of metadata, indicating that each typology provides specific information according to its function and usage. Structural metadata consists of organizational details that facilitate understanding the internal architecture of digital resources, offering insights into the structure of the content itself. On the other hand, descriptive metadata must be recorded subsequently to provide information enabling the search and retrieval of digital resources. Meanwhile, administrative metadata can be automatically captured, identifying attributes such as creation date, file format, resolution, and image size.

In the contemporary digital context, the metadata importance is recognized as an essential part of the discovery, management, and reuse of all types of objects, whether digital or not.

As defined by Yee (2009) and elaborated by Castro (2012), data structure encompasses the intangible layer within the representation and description process of along with metadata formats and standards. These interconnected elements promote the interoperability of digital information environments to ensure access, retrieval, use and reuse of information resources by human and machine users.

The tangible layer, according to Castro (2012), pertains to data provision in the Web environment. It represents the final stage and involves the ability to present them as they were constructed and stored (input), thus becoming available for retrieval. Therefore, it can be inferred that the tangible layer concerns data presented to users in an accessible and visible manner.

Given the definition proposed by the World Commission on Environment and Development (Comissão Mundial..., 1991), which states that sustainable development is the ability to meet the needs of the present without depriving or compromising restricting future generations from meeting the same needs in the future, the following question arises: how can we ensure that digital library metadata is accessible, reusable, and reproducible in the long term?

Considering the challenges present in the current technological digital preservation scenario, such as the metadata conservation in digital libraries, the general objective of this research is to identify the metadata standards used in the Luso-Brazilian Digital Library, aligned with the Best Practices for publishing data on the Web proposed by the World Wide Web Consortium (W3C), in order to ensure the integrity and continuous access to digital resources over time, promoting the sustainability of cultural heritage. Thus, the specific objectives are: a) Highlight the importance of digital preservation in promoting sustainability in cultural heritage collections; b) Identify metadata standards adopted by the LBDL; c) Map W3C's best practices in the LBDL.

In response to this demand, it is imperative to ensure, through the metadata and metadata standards available in the digital preservation process, in conjunction with the use of technological tools, that the data stemming from the digitalization and provision of cultural heritage remains accessible and available in the long term.

LITERATURE REVIEW

The digitization of resources and the availability of institutions' digital collections on a single platform are coordinated by cultural heritage preservation programs in digital environments, functioning as digital curators of rare collections. As an example in this research, the Luso-Brazilian Digital Library (LBDL) is mentioned, which comprises a portal aggregating digital collections from the National Libraries of Brazil and Portugal, the National Register of Digital Objects and the Brazilian Virtual Memory Network.

The project of the Luso-Brazilian Digital Library (BDLB), launched in February 2014 by the national libraries of Brazil and Portugal, aims to coordinate the digitization of collections and provide all digital material from the two institutions on a single platform. This represents a significant initiative to expand the online reach of cultural content shared by the common history among Portuguese-speaking countries (BDLB, 2024).

Although termed a digital library, the project has a digital repository structure, with digital aggregator services characteristics, functioning as gathers and provides digital content from four different institutions in one place. According to Oliveira and Carvalho (2009), “[...] aggregators collect metadata from different data providers and make it available to join different service providers.” (p.9). Thus, the main function of the LBDL is to aggregate and centralize data related to these collections, simplifying access to content scattered across the Internet.

Digital Repositories (DR) are online platforms that organize scientific production from institutions or thematic areas, capable of storing different file formats. These platforms offer various benefits, such as visibility for research, preservation of scientific production development and can be institutional or thematic, encompassing specific productions of an institution or a specific area. (Instituto Brasileiro de Informação em Ciência e Tecnologia - IBICT, 2020)

In this sense, the LBDL can be considered a thematic repository as it is an online environment for the preservation, dissemination, access, and storage of production from the shared cultural heritage by history and language among Portuguese-speaking nations.

The software used by the Luso-Brazilian Digital Library is DSpace, which enables advanced search through Collections (National Digital Library of Portugal, BNDigital of Brazil, Rede Memória, RNOD) and the application of filters such as Authors, Titles, Subjects, Document Type and Languages.

According to the IBICT (2023), the DSpace software is a free open-source software originally developed by the Massachusetts Institute of Technology (MIT) and Hewlett-Packard (HP). The software's global use is promoted, developed and supported by the DuraSpace organization, while in Brazil this role is played by the IBICT. Through DSpace storage, management, preservation and visibility assurance of intellectual production in digital repositories and libraries are enabled. Additionally, the management of various types of digital documents is allowed by the software, ensuring long-term access and offering the possibility of

customization of multiple functionalities to meet the informational demands of institutions, their users, and interoperability with other software and information environments.

In Brazil, the DSpace software has been used by other institutions to provide digitized collections and metadata resulting from the digitization process of rare collections, for example. Garcia (2021) highlights the use of DSpace at the Biblioteca Brasiliana Guita e José Mindlin, an interdisciplinary center for information and documentation, research and scientific dissemination at the University of São Paulo (USP).

The increasing availability of data and information in digital repositories in the Web era raises questions about long-term access and the data and metadata's integrity. In this context, it is essential to ensure access to content by promoting data interoperability in these informational environments. The World Wide Web Consortium (W3C) (2017) has established recommendations for "Best Practices for Data on the Web", which are guidelines that aim not only to standardize the publication of data on the Web, but also to ensure the consistency, quality, and long-term data and metadata's preservation.

Overall, the goal is for data publishers to share information, whether in an open or controlled manner, while consumers, who can also play the role of publishers, aim for data to be found, used, and related accurately, updated, and always accessible. In this sense, the W3C Recommendations propose guidelines for publishers so that data management becomes more consistent, promoting the use and reuse of shared data.

Each Best Practice described in the recommendations proposes ways for publishers and data consumers to overcome challenges in publishing and consuming data on the Web. For each challenge in the document, one or more Best Practices are presented, with at least one indicating its relevance (Lóscio et al., 2017).

As described by Lóscio et al. (2017) and illustrated in Table 1, each good practice has a corresponding set of benefits. According to Lóscio et al. (2017), "[...] a benefit represents an improvement in the way datasets are made available on the web. A best practice (BP) may have one or more

benefits.” However, upon analyzing the set of benefits, it was found that in each set of BPs, each BP has at least two benefits, with most being related to data reuse. The benefit of reuse can be directly related to the issues of preservation and sustainability discussed in this research.

In Table 1, the benefits are represented by codes that can be associated with each Best Practice and relate to: Reusability (R), Comprehensibility (C), Discoverability (D), Processability (P), Trust (T), Linkability (L), Interoperability (I) and Accessibility (A). It is also noted that some benefits are associated with the different Best Practices, highlighting the multifunctionality of these practices to improve different aspects of the management and use of data on the Web. The contribution of Best Practices in facilitating comprehension, discovery, and reuse of data sets, as well as in fostering trust, interoperability, and accessibility, is emphasized. These practices provide a comprehensive set of essential guidelines for ensuring the quality, accessibility, and usefulness of data available on the Web, promoting standardization, and enhancing the user experience with digital data.

Table 1: Publishing Data on the Web: requirements and benefits

BP	Requirements	Benefits						
1	Provide metadata	R	C	D	P			
2	Provide descriptive metadata	R	C	D				
3	Provide structural metadata	R	C		P			
4	Provide data license information	R				T		
5	Provide data provenance information	R	C			T		
6	Provide data quality information	R				T		
7	Provide a version indicator	R				T		
8	Provide version history	R				T		
9	Use persistent URIs as identifiers of datasets	R		D			L	I
10	Use persistent URIs as identifiers within datasets	R		D			L	I
11	Assign URIs to dataset versions and series	R		D		T		
12	Use machine-readable standardized data formats	R			P			

13	Use locale-neutral data representations	R	C					
14	Provide data in multiple formats	R			P			
15	Reuse vocabularies, preferably standardized ones	R	C		P	T		I
16	Choose the right formalization level	R	C					I
17	Provide bulk download	R						A
18	Provide Subsets for Large Datasets	R			P	L		A
19	Use content negotiation for serving data available in multiple formats	R						A
20	Provide real-time access	R						A
21	Provide data up to date	R						A
22	Provide an explanation for data that is not available	R				T		
23	Make data available through an API	R			P			I A
24	Use Web Standards as the foundation of APIs	R		D	P		L	I A
25	Provide complete documentation for your API	R				T		
26	Avoid Breaking Changes to Your API					T		I
27	Preserve identifiers	R				T		
28	Assess dataset coverage	R				T		
29	Gather feedback from data consumers	R	C			T		
30	Make feedback available	R				T		
31	Enrich data by generating new data	R	C		P	T		
32	Provide Complementary Presentations	R	C			T		A
33	Provide Feedback to the Original Publisher	R				T		I
34	Follow Licensing Terms	R				T		
35	Cite the Original Publication	R		D		T		

Legenda

R = Reuse

C = Comprehension

D = Discoverability

P = Processability

T = Trust

L = Linkability

I = Interoperability

A = Access

Source: Adapted from W3C (2017).

The application of Best Practices is intended to help in the promotion of data reuse and to establish greater trust in data among developers, regardless of the technology they use, thereby enhancing the role of the open platform that the Web represents by establishing effective connections.

Each of the benefits identified in Table 1 represents an improvement in the amount of data available on the Web. According to Lóscio et al. (2017), the improvements are described as:

Comprehension (C): people will have a better understanding of the structure and meaning of the data, the metadata and the nature of the dataset.

Ease of Processing (P): machines will be able to automatically process and manipulate the data within a dataset.

Discoverability (D): machines will be able to automatically discover a dataset or data within a dataset.

Reuse (R): the possibilities of reusing the dataset by different groups of data consumers will increase.

Trust (T): the trust customers place in the dataset will increase.

Linkability (L): it will be possible to create links between data resources (datasets and data items).

Ease of Access (A): people and machines will be able to access up-to-date data in a variety of ways.

Interoperability (I): it will be easier to reach consensus between data publishers and consumers.

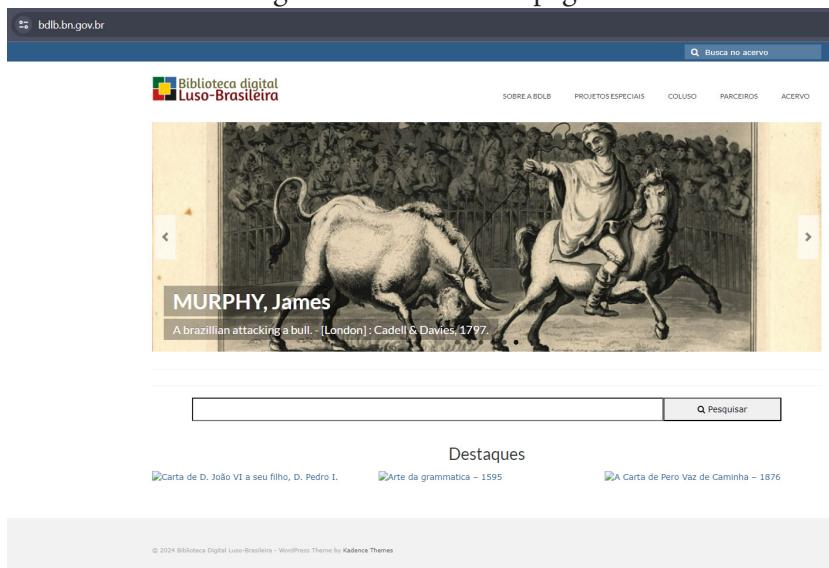
Given the requirements presented and the data management improvements offered by the W3C Best Practices, it is understood that these guidelines are fundamental for institutions that manage cultural heritage in the Web environment, such as libraries or digital repositories. These practices improve data discovery, facilitate processing, enhance search and retrieval, ensure data trust, and connect disparate resources. In addition, they promote data reuse, ensure its access, use and long-term preservation, enable the digital delivery of cultural heritage, and promote sustainability.

Although the requirements listed in the Best Practices for Publishing Data on the Web were not designed specifically for digital libraries, it is understood that their adoption can ensure greater consistency and data quality.

In this research, the example of the Luso-Brazilian Digital Library (LBDL) stands out due to its historical significance and the importance it places on preserving and protecting the heritage of Brazil and Portugal. Initially, the project included the digital collections of the national digital libraries of Brazil and Portugal, the National Register of Digital Objects, and the Brazilian Virtual Memory Network. The LBDL can be accessed at <https://bdlb.bn.gov.br/>.

On the LBDL home page, Figure 1, a carousel of images from the digital collection is highlighted. At the top is a simple search engine, and just below are five navigation tabs: “About LBDL”, “Special Projects”, “Coluso”, “Partners” and “Collection”. At the bottom, just below the carousel, is another larger search engine, followed by highlights from the collection, also in carousel format.

Figure 1: LBDL Homepage.

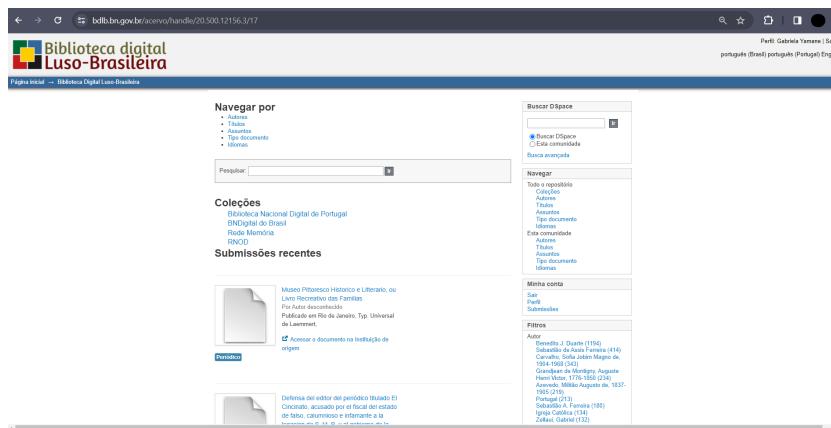


Source: Authors (2024).

The platform does not provide visual or auditory accessibility options, nor does it provide alternative language references on the home page. In addition, there is no FAQ section to help users with search and retrieval, nor is there a contact point for clarification.

Browsing and searching options are presented to researchers when they click the Collection tab, as shown in Figure 2. Three language options are available on this screen: Portuguese (Brazil), Portuguese (Portugal), and English. The items, called “Recent Submissions”, are displayed in list format and include data such as title, author, material type, print, and access link to the originating institution. In the right-hand column, there are filter options for simple and advanced searches; you can search the entire repository or a specific collection. You can also subscribe to collections and receive updates.

Figure 2: Collection interface.



Source: Authors (2024).

The documents available through the LBDL are organized into collections or communities, encompassing for example Album, Article, Atlas, Drawing, Disk, Electronic document, Ephemera, Fascicle, Flyer, Photograph, Print, Image, Incunabula, Libretto, Book, Manuscript, Map, Printed and manuscript cartographic material, Two-dimensional graphic material, Printed and manuscript textual material, Matrix, Microform,

Multimedia, Printed and manuscript music, Rare work, Score, Musical scores, printed and manuscript, Periodical, Plant, Computer products, Electronic resource, SOUND, Polycopied text, Book tome.

Figure 3: Register presentation.

Source: Authors (2024).

Regarding the presentation of the records, as depicted in Figure 3, it was noted that only a few fields allow interconnection with other records, thus enabling the retrieval of additional information through hyperlinks, such as in the case of subjects. In this regard, other types of relationships are not established, which limits the search and discovery of new documents, for example, by date, document type, authorship, or imprint.

Each record displays a description of the item that generally includes the fields covered by the Dublin Core metadata standard (Title; Creator; Subject; Description; Publisher; Contributor; Date; Resource Type; Format; Identifier; Source; Language; Relationship; Coverage; Rights), but when viewing the data, researchers are not informed of the metadata standards or protocols used. Furthermore, there is no way to import metadata or select the visualization format. It was possible to identify the use of Dublin Core from the source code of the library page.

The LBDL's digital collection is not centralized in one of the project's repositories. Each item in the digital collection, known as a digital object,

is maintained and managed by each participating institution, which is responsible for making it available. When a researcher accesses a particular item, he or she is directed to the original institution's collection via a hyperlink. This approach reflects the decentralized nature of the LBDL, where the LBDL acts as a service aggregator, unifying and providing access to different digital collections held by partner institutions. This distributed structure emphasizes the collaboration among participating institutions, allowing researchers to explore and use the digital resources of different institutions in a single location.

In this context, by directing researchers to the original collections through hyperlinks, the LBDL takes a decentralized approach to preserving digital collections. In this way, each institution can apply its best digital preservation practices, promoting the sustainability of the collections over time.

Rockembach and Pavão (2024) state that the hyperlink serves as the link between the user and the online resource they seek, and studies in the field have shown that ensuring access to these hyperlinks is highly fragile, requiring digital preservation measures.

As described by Sayão (2010), digital preservation is a constant challenge, both in terms of technical and organizational activities, because the physical state of digital collections is highly dependent on the current technological context, which in turn can change rapidly.

According to Rockembach and Pavão (2024), institutions such as libraries and museums that make historical and cultural information available on the Web tend to have more comprehensive digital preservation policies, which may include specifics for digitizing and storing physical artifacts as well as procedures for curating and organizing this content in the Web environment. The authors note that tools for capturing, storing, and managing content on the Web are essential elements that must be considered to ensure that information is preserved and made available to users over time.

Therefore, it is essential for institutions collaborating on digital preservation projects to coordinate in order to apply policies and best practices for the preservation and sustainability of their cultural heritage.

METHODOLOGY

The methodology used to carry out the research is qualitative in nature.

With regard to the approach to the subject and the objectives, it is descriptive in nature, using bibliographical research to explore the existing scientific literature on the subject in order to identify the conceptual basis and the context in which it is inserted.

The study adopted bibliographical research as its data collection method.

The methodological procedures involved stages that included, first, a bibliographic survey at national and international levels, followed by the collection of data and metadata in the Luso-Brazilian Digital Library. After this stage, the structure of the LBDL was analyzed, highlighting the availability and organization of the records. This assessment included compliance with established metadata standards and the requirements of the Best Practices for the Dissemination of Data on the Web, as recommended by the World Wide Web Consortium (W3C), with special attention to ensuring the sustainability of the system.

RESULTS

As mentioned in the introduction, the digitization of rare collections is a way to preserve historical and cultural collections in digital formats for sustainability and long-term availability. Nevertheless, the majority of institutions lack a well-defined digital preservation policy, with many policies being either vague or entirely absent.

Faced with this issue, this study was based on the identification of the metadata standards adopted by the LBDL and proposes a mapping of the best practices recommended by the W3C.

Table 2 shows a mapping between the thirty-five best practices recommended by the W3C and the way in which the digital resources of the Luso-Brazilian Digital Library (LBDL) are represented and made available, according to the dataset available at: <https://bdllb.bn.gov.br/acervo/handle/20.500.12156.3/29850>.

Table 2: Mapping between W3C and LBDL Best Practices.

BP	Requirements	Comply	Doesn't comply	Partially complies	BP analysis
1	Provide metadata	X			
2	Provide descriptive metadata			X	The descriptive metadata is available as a dataset in human-readable format. To access the metadata in a valid machine-readable format, it is necessary to access the developer options.
3	Provide structural metadata			X	Structural metadata is not available in datasets in human-readable format. To access the metadata in a valid machine-readable format, it is necessary to access the developer options.
4	Provide data license information			X	DSpace License Identified © 2002-2012 Duraspace.
5	Provide data provenance information		X		
6	Provide data quality information		X		It was not possible to identify.
7	Provide a version indicator		X		It was not possible to identify.
8	Provide version history		X		It was not possible to identify.

9	Use persistent URIs as identifiers of datasets	X			Handle
10	Use persistent URIs as identifiers within datasets	X			PURL, Bn of Portugal.
11	Assign URIs to dataset versions and series		X		
12	Use machine-readable standardized data formats	X			
13	Use locale-neutral data representations	X			
14	Provide data in multiple formats		X		
15	Reuse vocabularies, preferably standardized ones		X		
16	Choose the right formalization level	X			
17	Provide bulk download		X		
18	Provide Subsets for Large Datasets		X		
19	Use content negotiation for serving data available in multiple formats		X		
20	Provide real-time access	X			
21	Provide data up to date			X	It does not specify the update frequency.
22	Provide an explanation for data that is not available		X		
23	Make data available through an API	X			Google API's
24	Use Web Standards as the foundation of APIs	X			

25	Provide complete documentation for your API		X		
26	Avoid Breaking Changes to Your API		X		
27	Preserve identifiers			X	In some cases, it informs you that it has been removed but does not inform you of a possible contact.
28	Assess dataset coverage	X			DCterms.
29	Gather feedback from data consumers		X		
30	Make feedback available		X		
31	Enrich data by generating new data		X		
32	Provide Complementary Presentations		X		
33	Provide Feedback to the Original Publisher		X		
34	Follow Licensing Terms		X		
35	Cite the Original Publication	X			

Source: Authors (2024).

Table 2 shows that the LBDL fulfills the requirement in BP 1 - “Metadata provision” by employing Dublin Core terms, for example, to offer descriptive metadata. In BP 2 - “Providing descriptive metadata” there is partial compliance as the metadata is accessible in a human readable format, but to access it in a machine readable format it is necessary to use the developer options. As for structural metadata, according to BP 3 - “Provide structural metadata”, there is also partial compliance, since this metadata is not available in a human readable format, and access to developer options is required to read it in a machine-readable format.

Regarding the requirement that deals with the license, BP 4 - “Provide information about the data license”, the DSpace© 2002-2012 Duraspaces license was identified, other licenses could not be identified because the information is not clearly expressed on the LBDL page and therefore could not be identified by human users.

There are also requirements that are not complied by the LBDL or are not clearly identified. For example, BP 5 - “Provide data provenance information” in the context of the LBDL is not clearly presented and it has not been possible to determine whether the requirement is met, so it has not been located by human users.

Best Practices 6, 7, and 8, related to “Provide Data Quality Information”, “Provide Version Indicator”, and “Provide Version History”, were assigned a “Does Not Meet” rating because it was not possible to determine whether the requirement was met because the information is not explicitly available on the LBDL page and therefore would not be identified by human users.

Regarding URIs, the LBDL was found to comply with Best Practices BP 9 and 10, “Use persistent URIs as dataset identifiers” and “Use persistent URIs as identifiers within datasets”. However, in relation to BP 11, “Assign URIs to versions of datasets and series”, it was not possible to determine whether the requirement is met.

In BP 12 - “Use standardized machine-readable data formats”, it should be noted that the XML data is embedded in the developer’s code and is not available in a separate file for download or import.

It was not possible to determine whether the requirement was met for BP: 17, 18, 19, 22, 29, 30, 31, 32, 33, 34 because the information is not explicit on the LBDL page and therefore could not be located by human users.

Regarding updates, in the requirement “Provide updated data”, BP 21, the frequency of data updates is not specified.

Concerning APIs in BPs 23 and 24, the LBDL meets the requirements to “Make data available through an API” and “Use web standards as a basis

for building APIs". However, it does not meet the requirements to "Provide complete documentation for APIs" and "Avoid changes that affect the functioning of your API", which correspond to BPs 25 and 26, respectively.

Regarding BP 27 - "Maintain identifiers", the LBDL it was observed that the LBDL partially meets the requirements, as in some cases, as in some cases it informs that the identifier has been removed or is not available, but it does not provide a contact to report the problem or try other forms of access.

DISCUSSION

Through the mapping, Table 2, it was possible to observe whether or not the LBDL complies with the requirements established by the W3C Best Practices, allowing the identification of areas in which the Digital Library can improve its standards and align its work with the best practices for publishing data on the Web, with a view to preserving and providing access to cultural heritage.

The statistical analysis of the mapping between the W3C Best Practices and the Luso-Brazilian Digital Library (LBDL) shows the panorama of the LBDL's compliance with these guidelines. Out of the 35 requirements identified, 11 were identified as "Comply", suggesting alignment with the recommended practices. However, 19 requirements were defined as "Doesn't Comply" as they could not be identified by human users, areas that require attention and development to ensure greater compliance with the established requirements. In addition, 5 requirements were defined as "Partially Comply", indicating the presence of positive initiatives, but with a gap for specific improvements. This analysis offers a view of the LBDL scenario in relation to best practices, providing insights for improving the quality, access and interoperability of the digital resources provided.

With regard to the Best Practices that were defined as "Doesn't comply", it is possible to establish relationships and group them according to their specificity and in accordance with the established guidelines. The groups are organized as follows:

Group 1 - Metadata and Contextual Information. Providing provenance information (BP 5) and quality information (BP 6) are essential aspects for understanding the origin and reliability of data; version indicators (BP 7) and version history (BP 8) contribute to the traceability and temporal reliability of data; assigning URIs to versions of datasets and series (BP 11) and providing an explanation for unavailable data (BP 22) are also related to the contextualization and transparency of data.

Group 2 - Data formats and access. Providing data in multiple formats (BP 14) and offering bulk downloads (BP 17) relate to the diversity of formats and data access options; providing subsets for large datasets (BP 18) and using content negotiation (BP 19) aim to facilitate data retrieval and manipulation.

Group 3 - Interactivity and Enrichment. Collecting feedback from data consumers (BP 29) and sharing available feedback (BP 30) indicate the importance of interactivity and engagement with users; enriching data by generating new data (BP 31), providing complementary visualizations (BP 32), and providing feedback to the original publisher (BP 33) are related to continuous improvement and interactivity in the library environment.

Group 4 - Governance and Compliance. Providing complete documentation for APIs (BP 25) and avoiding changes that affect the functioning of the API (BP 26) are related to the governance and stability of the services provided; adherence to license terms (BP 34) is fundamental to ensuring legal and ethical compliance in the provision of data.

These relationships indicate that greater focus will be directed towards metadata, data formats, user interactivity, and governance issues, all of which can significantly contribute to aligning the LBDL with the best practices recommended by the W3C.

CONCLUSION

This research examined the Luso-Brazilian Digital Library (LBDL) through the lens of the W3C Best Practices, highlighting its significance for the preservation of the Luso-Brazilian cultural heritage. The analysis

revealed that although the LBDL meets some of the requirements of the Best Practices proposed by the W3C, there are aspects that require greater attention, particularly concerning metadata and data formats, as these are considered key elements for ensuring digital preservation. Therefore, the importance of preservation policies that guarantee the access, use and reuse of data among collaborating institutions over time is emphasized.

Bringing together the tangible and intangible layers of digital environments, as the BDL does in promoting interoperability, presents a challenge that will enable any type of user, whether human or machine, to recognize, process, and utilize data and metadata. The adoption and utilization of metadata standards linked to the W3C Best Practices are *sine qua non* for creating accessible digital collections that can be used and reused in the long term.

It is hoped that this study can contribute to a reflection on digital preservation, emphasizing the need for more precise guidelines and explicit policies. The LBDL serves as a prime example of the ongoing challenges in digital preservation and the importance of adhering to internationally recognized standards to ensure the interoperability and sustainability of digital cultural heritage. The LBDL's gradual embrace of W3C Best Practices can ensure its contribution to the preservation of cultural heritage for future generations.

REFERENCES

Biblioteca Digital Luso-Brasileira. (2024). *Sobre a BDLB*. BDLB. https://bdlb.bn.gov.br/?page_id=193

Castro, F. F. D. (2012). *Elementos de interoperabilidade na catalogação descritiva: configurações contemporâneas para a modelagem de ambientes informacionais digitais*. [Tese de Doutorado, Faculdade de Filosofia e Ciências, Universidade Estadual Paulista]. Repositório Institucional Unesp. <http://hdl.handle.net/11449/103364>

Comissão Mundial sobre Meio Ambiente e Desenvolvimento. (1991). *Nosso futuro comum*. FGV. https://edisciplinas.usp.br/pluginfile.php/4245128/mod_resource/content/3/Nosso%20Futuro%20Comum.pdf

Digital Library Federation. (1998). *A working definition of digital library*. DFL. <https://old.diglib.org/about/dldefinition.htm>

Garcia, R. M. (2021). Desenvolvimento da nova Biblioteca Digital da BBMUSP: relato de experiência. In Colmenero-Ruiz, M. J., Cuevas-Cerveró, A., Passarelli, B. & Paletta, F. C. (Org.). *Memória, Patrimônio Digital e Políticas de informação: trilhas abertas no Brasil e Espanha* (pp. 67-83). ECA-USP.

Hurley, B. J., Price-Wilkin, J., Proffitt, M., & Besser, H. (1999) *The Making of America II Testbed Project: a digital library service model*. Digital Library Federation. <https://www.clir.org/pubs/reports/pub87/>

Instituto Brasileiro de Informação em Ciência e Tecnologia. (2023). *DSpace*. <https://www.gov.br/ibict/pt-br/assuntos/tecnologias-para-a-informacao/DSpace>

Instituto Brasileiro de Informação em Ciência e Tecnologia. (2020) *Repositórios digitais*. <https://antigo.ibict.br/informacao-para-a-pesquisa/repositorios-digitais>

Lóscio, B. F., Burle, C., & Calegari, N. (2017). *Data on the Web best practices*. W3C Working Draft, World Wide Web Consortium (W3C). <https://www.w3.org/TR/dwbp/>

Oliveira, R. R., & Carvalho, C. L. (2009). *Implementação de Interoperabilidade entre Repositórios Digitais por meio do Protocolo OAI-PMH*. (Relatório Técnico). Universidade Federal de Goiás, Instituto de Informática, Goiânia.

Pinheiro, A. V. (2015) Livro raro e sustentável. *Revista Museu*. Retrieved January 04, 2024, from <https://www.revistamuseu.com.br/site/br/artigos/18-de-maio/18-maio-2015/3098-livro-raro-e-sustentavel.html>

Reitz, J. M. (2004). *Online Dictionary For Library And Information Science - (ODLIS)*. https://odlis.abc-clio.com/odlis_d.html

Rockembach, M., & Pavão, C. G. (2024). *Arquivamento da web e preservação digital*. Pimenta Cultura. <https://doi.org/10.31560/pimentacultural/2024.98119>

Sayão, L. F. (2010). Uma outra face dos metadados: informações para a gestão da preservação digital. *Encontros Bibli: revista eletrônica de biblioteconomia e ciência da informação*, 15(30), 1-31. <https://periodicos.ufsc.br/index.php/eb/article/view/1518-2924.2010v15n30p1>

W3C. World Wide Web Consortium. (2017). *Data on the web best practices*. W3C. <https://www.w3.org/TR/dwbp/>

Yee, M. M. (2009). Can bibliographic data be put directly onto the semantic web?. *Information Technology and Libraries*, 28(2), 55–80. <https://doi.org/10.6017/ital.v28i2.3175>

SOBRE O LIVRO

CATALOGAÇÃO NA PUBLICAÇÃO (CIP)

Telma Jaqueline Dias Silveira
CRB 8/7867

FORMATO

16 x 23cm

NORMALIZAÇÃO

Elizabete Cristina de Souza de Aguiar Monteiro
CRB - 8/7963
Janaína Celoto Guerrero de Mendonça
CRB - 8/6456

TIPOLOGIA

Adobe Garamond Pro

CAPA E DIAGRAMAÇÃO

Gláucio Rogério de Moraes

PRODUÇÃO GRÁFICA

Giancarlo Malheiro Silva
Gláucio Rogério de Moraes

ASSESSORIA TÉCNICA

Renato Geraldi

OFICINA UNIVERSITÁRIA

Laboratório Editorial
labeditorial.marilia@unesp.br

2025

This book serves as a practical guide and comprehensive analysis of how Information Science can be integrated into sustainable practices, with insights spanning digital transformations, information behavior, knowledge organization, and more. The book explores the intersections between Information Science and sustainability from multiple perspectives, illustrating how libraries, information literacy, and digital tools contribute to building a sustainable future. It is a set of 27 chapters organized into five main parts, "21st Century Skills and the Information Profession", "Digital Transformation and Sustainability", "Information Behavior and Sustainability", "Libraries and Education for Sustainability" and "Knowledge Organization to Support Sustainability", which stem from the selection of presentations made at the 32nd BOBCATSSS Conference held at the University of Coimbra, Portugal from January 23 to 25, 2024 and co-organized by the São Paulo State University – UNESP, Marília Campus. Each part investigates the unique ways in which information workers are adapting to the demands of the 21st century and contributing to environmental and social well-being in different cultural and institutional contexts.

ISBN 978-65-5954-625-1



9 786559 546251