Digital Curation and Gender in Information Science
access and preservation

access and preservation

Organizadores

Maria José Vicentini Jorente | Rosa San Segundo
José Antonio Frias Montoya | Daniel Martínez-Ávila
Stephanie Cerqueira Silva

EDICIC

OFICINA UNIVERSITÁRIA

CULTURA ACADÊMICA
Editora

CAPES

ppgci
unesp

DIGITAL CURATION AND GENDER IN INFORMATION SCIENCE: ACCESS AND PRESERVATION

DIGITAL CURATION AND GENDER IN INFORMATION SCIENCE: ACCESS AND PRESERVATION

MARIA JOSÉ VICENTINI JORENTE
ROSA SAN SEGUNDO
JOSÉ ANTONIO FRIAS MONTOYA
DANIEL MARTÍNEZ-ÁVILA
STEPHANIE CERQUEIRA SILVA
(ORGANIZERS)

A coedition:

With the support:

SUMMARY

PREFACE

The book **Digital Curation and Gender in Information Science: Access and Preservation** addresses digital information in its different supports, where it will be subjected to different and new conceptual treatments and technical processes aimed at specific demands, the optimization of all these procedures called digital care or curation, which includes appraisal, treatment, organization and sharing of the most relevant content. Digital curation, or content curation, is an emerging professional field, emerging in the context of the explosion of web content and Web 2.0.

Digital curation is a topic of great relevance to Information Science and is treated in this work from a critical and quite innovative perspective and methodology. The work is based on a research stay by Professor Maria José Vicentini Jorente, from São Paulo State University, which took place in 2020. The work deepens the thread that leads us through Digital Curation, articulates and enables a rigorous and rich study, the results are not limited to the studied subject, but can be used in other analyzes of scientific activity and forms of information management. Due to the rigor with which the study was carried out, the results obtained are, in addition to being unprecedented, conclusive, enriched with the use and conceptualization of an updated and rigorous terminology. The future of our studies involves analyzes such as the one presented.

The chapter **Archiving Bodygraphy Memory: bets for sensitive masculinity in the context of the body-archive**, by Jordi Planella, Open University of Catalonia, analyzes the way of perceiving and recording the experiences of our bodies. It analyzes the experiences lived by a group of university students in the construction of their masculinity

through an exercise of visual self-representation. They identify two major pedagogies in the formation of masculinities by the participants: one anesthetizing and the other sensitive and/or resistance. Critical dialogues generate useful guidelines to overcome educational practices that perpetuate the traditional masculinity model, to build a critical and transformative citizenship in the face of traditional masculinity conceptions. The body is inscribed in the life of the subjects of the body-archive category. What is analyzed from audiovisual bodygraphies of a group of master's students and the forms of body writing through tattoos. In both, conceptions of masculinity socially constructed during the school period were naturalized. These social constructions, as it could be otherwise, respond to certain socio-historical educational contexts, constructed mostly from hegemonic power relations. But the most important thing is that the awareness of these situations unfolds a set of resistance elements that materialize in the body-archive and in the development of what we can call "sensitive masculinities".

The second chapter **Female leadership in the emerging field of digital curation**, by professors María-Antonia Ovalle-Perandones from the Complutense University of Madrid, Mirelys Puerta-Díaz from the São Paulo State University and Daniel Martínez-Ávila from the University of León, is a bibliometric study on women's scientific leadership in digital curation. They include the complete conceptualization of digital curation provided by The Digital Curation Center (DCC). The object of study linked to science and technology is presented as a landmark for the exclusion of women. They argue that the domain of digital curation shows signs of a slight shift in this trend as they move into some scientific leadership roles.

The chapter **Gender perspective on digital environments** addresses the challenges that arise in the digital context and how stereotypes, prejudices and discrimination are reproduced. By Professor Marian Blanco-Ruiz University Institute of Gender Studies of the Carlos III University of Madrid, she analyzes the reproduction of stereotypes on digital environments, such as symbolic violence, where women are

represented in image database, social networks, anonymous actions and identity theft. It proposes to incorporate a gender perspective and intersectionality in research on digital media and communication, in order to build a more egalitarian and fairer digital environment.

The chapter **Recovering "faith in humanity": data, content and information curation in confronting violence against women - a preliminary essay**, by William Barbosa Vianna, Federal University of Santa Catarina, Maria Cristina Vieira de Freitas, University of Coimbra, Andrea Vasconcelos, Federal University of Rio Grande do Norte and Denise Fukumi Tsunoda, Federal University of Paraná analyzes the relevance of data and information about women in digital curation to work with public safety in the prevention of violence against women. The results highlight the relevance of identifying victims, activating protocols using artificial intelligence and machine learning, geolocation, recording of violent behavior. All this must begin to overcome the invisibility and thematic dispersion of scientific literature.

The chapter **Digital Curation in Collections and Digital Environments of Women's Museums**, by Stephanie Cerqueira Silva from the São Paulo State University and Maria José Vicentini Jorente from the São Paulo State University, contextualizes the emergence of identifying digital collections of women's museums, since they present themes that expand the possibilities of building female protagonism in various social practices. In this context, the convergence between Digital Curation and Information Science is sought, as they contribute to the construction of collections on digital environments, based on information organization, presentation and representation. The implementation of Digital Curation strategies and actions for the construction of collections in environments that promote and expand the goals of women's museums.

The chapter **Design and digital curation for a virtual space for the visually impaired**, by Cristina Portugal from the Pontifícia Universidade Católica of Rio de Janeiro, Mônica Moura from the São

Paulo State University, Márcio Guimarães from the Federal University of Maranhão, Iana Uliana Perez from the São Paulo State University and José Carlos Magro Junior, from São Paulo State University present the digital curation process of a pilot project called "I remembered you", through which a network of volunteer readers was established in support during and after the Covid-19 pandemic and helps people with visual impairment and the elderly, through reading and audio production, alleviate states of loneliness, awaken memories, create mental images, expand the knowledge repertoire, social integration, improve quality of life and well-being, taking into consideration the scope of inclusive design and design with social responsibility. Digital curation also included managing the datasets - audios, volunteers, listeners - so that data can be accessed and searched, so digital curation extends beyond the control of the repository that archives the data, but extends management throughout the life cycle of digital material.

The chapter **The Role of Digital Preservation in Digital Curation**, by José Carlos Abbud Grácio from the São Paulo State University and Telma Campanha de Carvalho Madio from the São Paulo State University presents the concepts that underlie digital preservation in the digital curation life cycle in the face of constant changes and advances, ensuring its authenticity. The work presents the concepts that support digital preservation, details its aspects and how they relate to the Digital Curation life cycle, although there is currently no specific training for a curator who integrates all these areas. In this sense, it concludes that the work must be done with the creation of multidisciplinary teams and in constant exchange with other institutions, favoring experience and knowledge exchange.

The chapter **Information Retrieval: the representation of the subjective**, by Edberto Ferneda from the São Paulo State University presents the subjective representation forms of the information retrieval process. This work analyzes the forms of computational representation of the concepts and operations in automated process for information retrieval of large data volume in a fast and agile way,

because it does not provide consistent or satisfactory results. The relevance of the retrieval implies in human capacities and abilities abstraction, apprehension and representation of its meaning, the concepts involved in the information retrieval process being subjective. Therefore, computer systems must be articulated so that they are able to formalize and represent them through algorithms and programs. Thus, more efficient ways of representing the subjectivity involved in this process should be sought.

The chapter **Digital Curation in Information Science: Information Design Strategies**, by Natalia Nakano from the São Paulo State University, Mariana Cantisani Padua from the São Paulo State University, Laís Alpi Landim from the São Paulo State University and Maria José Vicentini Jorente from the São Paulo State University deals with strategies of Information Design in Digital Curation. It proposes Information Design and Experience Design as digital curation strategies for information preservation, access and exchange, which, in turn, favor its preservation. It is pointed out that Information Design organizes material, informational, sensory, cognitive and humanistic aspects of the subjects that interact with the environment so that communication in the interfaces of digital environments does not cause a cognitive overload to the visitor. Information Design resources must guide the material aspects, as well as the sensorial, cognitive and humanistic aspects, since improving the effectiveness of digital environments is not just a technical issue, resolved only by one area. Information Design and Experience Design must be incorporated into curation, becoming a transparent and very useful resource for society.

The chapter **Facets of Digital Curation in Post-custodial Paradigm: collective and social curation**, by Lucinéia da Silva Batista from the São Paulo State University and Maria José Vicentini Jorente from the São Paulo State University, analyzes contemporary post-custodial society and what it implies for libraries, archives and museums a Digital Curation of heterogeneous social narratives and polysemic voices. However, this process does not fully incorporate the participation

of individuals and communities. Other issues of the facets of Digital Curation must be integrated that stimulate the opening of museums, and convert cultural contents to be curated, in a participatory way, in the construction of a transcultural narrative, with the collaboration and involvement of subjects and communities. In a postmodern society characterized by diversity and instability where everything is flexible and volatile, stakeholders have to be involved. Postmodernity allows a critical look at the curation processes, where they can emerge with the opening of museums and the community participation and collaboration for the construction of a transcultural heritage, of values and multiple representations, a rupture with the previous custodial and hegemonic paradigms, the organizational and the technical scientist, as their authors point out.

Clara Sainz de Baranda Andújar

Directora del Instituto de Estudios de género de la Universidad Carlos III de Madrid

CHAPTER 1

ARCHIVING THE BODYGRAPHY MEMORY: BETS FOR SENSITIVE MASCULINITY IN THE CONTEXT OF THE BODY-ARCHIVE

JORDI PLANELLA
Universitat Oberta de Catalunya

ABSTRACT

The purpose of this study is to analyze the experiences of a group of higher education students in order to understand how they lived the construction of masculinity during their formative stage. We analyzed, using a qualitative method based on a biographical and interpretative perspectives, 72 bodygrafies performed by students of the Master of Psychopedagogy of the Universitat Oberta de Catalunya as part of an exercise in visual self-representation. The results of the analysis allowed us to identify two great pedagogies in the construction process of masculinities: an anesthetic pedagogy and other sensitive and/or resistance pedagogy. The results obtained from the analysis of visual narratives show valuable experiences that encourage critical dialogues, from which useful guidelines are derived in order to overcome educational practices that perpetuate the model of traditional masculinity. In this way, the text reveals a latent social reality and provokes the reflection on how to promote a critical and transformative citizenship that overcome the conceptions of masculinity of traditional archetype.

Keywords: Bodygraphy, sensitive pedagogy, new masculinities, teacher training, body language.

RESUMEN

El presente texto tiene por objetivo analizar las experiencias vividas por un grupo de alumnado universitario con la intención de comprender cómo han vivido la construcción de la masculinidad durante su etapa formativa. Desde un enfoque cualitativo, adoptando una perspectiva biográfica e interpretativa, se analizan 72 corpografías que fueron entregadas por alumnos del Máster de Psicopedagogía de la Universitat Oberta de Catalunya, como parte de un ejercicio de auto-representación visual. Los resultados del análisis permiten identificar dos grandes pedagogías en la formación de masculinidades por parte de los participantes: una pedagogía anestesiante y otra pedagogía sensible y/o de la resistencia. Los resultados obtenidos del análisis de las narraciones visuales permiten dar a conocer valiosas experiencias que fomentan diálogos críticos, de las que se derivan pautas útiles con el objeto de superar prácticas educativas que perpetúen el modelo de masculinidad tradicional. De esta forma, el presente texto revela una realidad social latente y da pie a reflexionar sobre cómo cimentar una ciudadanía crítica y transformadora que deje atrás las concepciones de masculinidad de arquetipo tradicional.

Palabras clave: Corpografía, pedagogía sensible, nuevas masculinidades, formación de profesorado, lenguaje corporal.

Images are the language of thought, they translate everything that can transmit discourse at the level of meaning and emotion, while maintaining absolute equality and fraternity with the freedom that arises from poetry, music and from the excessive presence of bodies. Marie-José Mondzain (2011, p. 123, our translation).

1 INTRODUCTION

My contribution to the book *Digital Curation and Gender in Information Science: access and preservation* aims to analyze a particular way of recording the bodily experiences of subjects. More specifically, it is about studying and analyzing different experiences in which I have participated as a researcher or author, in which particular ways of thinking, living and resignifying the human body have been deployed, as well as ways of registering it which have followed. These can be direct experiences or interpretations of experiences lived by others that have led me to analyze the ways and formats of recording and embodying bodies. In all of them the body appears and is drawn as an object of study, the body as a living archive of personal memory, and with it a step from the carnal to the symbolic is produced.

It is a hermeneutical turn we could well name as the "body turn" to signify the vision and interpretation of the body beyond its anatomy and physiology. It is not strange, however, that we can speak of the body and think of it as a file, as an anatomical-symbolic record of our lives. For the performer Abel Azcona (2020, p. 32, our translation): "my work is an extensive annotation, erasure, log, record. I am file-body-art. Each performance responds -from the language and stage of art- to looking at and thinking about the topics that interest me". Body and art, in his case, or body and life in the case of the stories narrated and studied in my work, are configured as ways of thinking about the body and its borders, the body and its limits. Thus, in the very idea of the body-archive, other words are drawn that accompany us: resistance, existence, corporality, bodygraphy, embody, live. The body is no longer something foreign, the body is me, the body is my life, my battlefield, my notebook, my archive of scars, wrinkles and experiences, my physical and symbolic support of the tattoos that mark the journey already taken.

2 SITUATING THE BODYGRAPHIES AS AN EXERCISE IN AUDIOVISUAL SELF-REPRESENTATION:

THE BODY-ARCHIVE

There are multiple and diverse exercises of reflection in the field of the arts, visual culture, anthropology or documentary curation, which are interested in other forms and formats of recording the lives of the subjects who embody and transit them. These formats are specified and expressed through other textures, beyond what we can call the "established and prevailing corporal order". Alba says when she states that "the economic and technological dislocation of recent centuries has displaced the body as the axis of experience, for better and for worse" (2019, p. 11, our translation). What I am going to talk about in this chapter is the analysis of the experiences that have recovered the central role of the body as the axis of experience, and that have dislocated (against all odds) the "neocon" order of bodies.

One of these forms can be called bodygraphy and it has great hermeneutic potential when applied to the uses of the body and the development of the identities of the subjects who embody them. In the last eight years, I have been outlining and shaping it as an exercise of somatic and personal self-representation of those who "do it". There is something at the bottom of this whole thing that, willingly or not, is related to what Henry (2018) reminds us:

> Each one, each man and each woman, at each moment of their existence immediately experiences their own body, experiences the pain that comes from going up a steep alley or the pleasure of a cool drink in the summer, even that of a light wind on the face" (p. 7, our translation).

In essence, we can say it has to do with inhabiting the body, but doing it consciously. This being aware entails, in part, registering what happens to oneself. It is a simple and effective way to look back and to the present, to become aware and to say (to oneself and to others) how life has passed through the body of the subject who speaks, writes, paints, draws, sculpts, narrates etc. This highlights that what happens to us in life is marked and recorded in our bodies; sometimes directly and others through our carnal transforming action.

For different reasons, we can link the concept of bodygraphy with that of cartography: on the one hand, because we could actually be talking about a certain mapping of the records that we make on and in the body; and on the other hand, for the "letters" that we have written to think, to become aware of the lived body. From a position linked to geography, the idea of the line is drawn, of the record of bodily journeys through a territory. In the field of Social Sciences and beyond geography, cartography has another meaning and other different applications. From the philosophy of Deleuze and Guattari (1988), the "cartographic" question takes on an unstoppable force and infiltrates many of the exercises aimed at the production of knowledge. This is how Passos and de Barros (2009, p. 17, our translation) put it: "Cartography as a research-action method presupposes an orientation of the researcher's work that is not carried out in a prescriptive way,

with already established rules or with already established objectives".

In a particular way, it is work I began to organize from the year 2013 -as a result of a collaboration with the University of Antioquia, Medellín, Colombia- and that little by little has mutated and refined until it reached its current form. We started with a recording format that consisted of writing a letter to a teacher that had impacted the corporal education of the person who wrote it. We recorded about 40 letters, but that narrative-textual format presented too many limitations. Among others, it was evident that we could not work with projects that narrated the body and its experiences without being able to show that body. Through a seminar I gave during my postdoctoral stay at the Federal University of Rio Grande do Sul (Porto Alegre) and which I titled *Pedagogia do Sensível*, I introduced the photographic record as a way of bodygraph. On that occasion, it was about 50 participants who, among other actions, were asked to combine text and image to say things related to their physical education. Finally, the format with which I have been working since 2016 is that of audiovisual bodygraphies. It is, in the words of Ledo (2020), about the body and the camera, or as I propose to my students to "put the body in front of the camera" to actually end up showing the body we are talking about while speaking with and from the body. We pass, in this way, from a body that we can establish or call a body-flesh to a body full of meaning, which well deserves to be called a body-archive. This is how Ledo (2020, p. 39, our translation) announces it when mentioning Hélène Cixous:

"her body-archive hates Pétain, hates the collaboration of the Vichy government with the Nazis, hates the phallocrats and does not declare herself identified with any cause except if it becomes necessary". The flesh body is a body exposed but not said, that is consumed without exercising its category of text; for its part, the body-archive is located in the symbolic dimension of the record, of the embodied word. The exercise linked to the current project, already fully located in this category of body-archive, consists of putting the body in front of the camera to speak, precisely about our somatic dimension. It is about explaining what has happened to it throughout years of learning, from early childhood until, as teachers or educators, they have continued studying a master's degree course.

At this point we can affirm that the relationship between body, identity and visual (or audiovisual) representation is of great interest in many sectors, but especially in the field of social sciences. I have agreed to call this relationship (somatic or corporal self-representation) "bodygraphy". I have been concerned and interested in the concept of "bodygraphy" for years, and that interest has focused on thinking about the ways of representing or self-representing oneself at the corporal level (Planella, 2006). It is a neologism that intends to set aside two concepts to create a new one: body and graphy. The first work I published with that expression is dated back to 2006 and I titled it: *Corpografías. Dar la palabra ao cuerpo* (*Bodygraphy.* Let the body speak). At that initial moment (without knowing the directions that the neologism itself would take or that the concept would end up becoming an exercise of self-representation with hints of investigative methodology) I only sought to study some forms and examples of allowing the body speak. It was about putting in evidence that the body could not and should not be silent. There I proposed that:

> Despite everything, the body −Leib or Körper−, depending on whether its symbolic or physical dimension gains strength, is still there, testimony, structure and essence of the subjectivities that inhabit and study it. The body is already inserted in the complex world of the social sciences and it does not intend to "abandon" it again. Poetry and boxing are two ways – twisted if you like – of subjectivizing and using the body, but two ways that open up multiple possibilities. And it is precisely

in that opening (we understand that without limits in the field of social sciences) where the body finds a territory of cultivation and transitions, of performances and hermeneutic gazes that do nothing but allow its opening to all those possibilities that are offer to it (Planella, 2006).

In essence, the bodygraphy I propose in 2021 follows the line started from that work. It is not so much about thinking of these forms from a biomedical or physiological perspective but rather from a symbolic perspective, close to certain traditions of philosophical anthropology (much more open to hermeneutical questions of language and symbol). Thus, we can say that it adopts, therefore, the perspective proposed by Shilling: "These analyses were not alone in their approach towards the body but followed and drew on a long tradition of philosophical and theological inquiry in the West" (2016, p. 14). Likewise, it is situated in the orbit of the works presented in the collective book *La tentation du corps*, and agrees with the conception of its coordinators, who propose in its prologue:

Le corps et ses déterminations biologiques ne sont plus une plaque de cire que la culture et les rapports sociaux modèleraint à leur guise, mais la matrice et le support physique dans lesquels s'ancrent de façon ultime, plus o moins complexe et directe selon le cas, les représentations sociales. (Memmi, Guillo & Martin, 2009, p. 14).

From this point of view, the body is situated as a space of symbolic representation and truly becomes a bodygraphy, a somatic design of itself that brings the flesh, the person, the word and the image into play.

Figure 1: Carne (Meat) (Porto Alegre, Medicine History Museum)

Source: Jordi Planella (July 2015)

The bodygraphies stand as an adequate approximation that can allow us to decipher signs that bodies tell us, transmit to us, write on their skins, narrate from their entrails and scream through their pores. And for this it is necessary to start from the reality that is situated

> in a context governed by the monopolization of normative images, the moving image (...) is presented as a way of escape from the dominant iconosphere and a tool of sociopolitical struggle, as well as the production of a new collective imaginary. (Caballero, 2014, p.102, our translation).

In this sense, bodygraphies as an audiovisual product can favor critical reflection on personal experiences related to the construction of male subjectivities, allowing students to share experiences and contrast realities, feelings and experienced situations. For the Argentine psychologist, Carlos Trosmann (2013, p. 81-82, our translation), "Body and Word form bodygraphy, attempts to decode the signals of the body, to map the words with which we appropriate our body, with which the body interweaves and emerges from culture. In turn, bodygraphy can be linked to the image and how bodies are represented (or self-represented) in it. Azcona (2020) radically speaks to us on this subject when he says:

> I am the child of your laws and institutions, I am the resistance fertilized after years of abuse and loss. I have resisted in spite of and from my body, using these artistic practices -some say some are avant-garde-, as my language before the world. Body-action, body-speaker. Now they demand my silence, when the first resistances had their spaces, their laws, their violence as a stage. When with my own voice I learned to respond to each of their prohibitions, now they try to make silence inhabit (p. 28, our translation)

To put on the body in the public space, to show it, to give something to talk about, to place the skin not as a limit between I and them, but as an inscribed word, as a communicative-demanding act. Bodygraphy unites the word and the flesh, brings into play and harmonizes the physiological and the symbolic of the human being.

With what has been proposed so far, we can advance that our conception of bodygraphy consists of a complex concept to define, of an elusive type, but precisely for this reason with many possibilities of being thought of and also applied to the field of Information Sciences. Despite the difficulties in defining it, we can conceive of bodygraphy as:

a. Something that allows reading the bodies from their social, cultural or symbolic status (and thus overcome a vision based on a physiological, biomechanical and organic hermeneutics of the human being).

b. The possibility of the body to write from the body or to

write with the body, thinking about it from its communicative, speaking and verbal condition.

c. The exercise that allows us to write on the body, either consciously (through tattoos, sports exercises to stylize the body, diets, cosmetic surgery operations, etc.) or through our own somatic experiences (scars, wrinkles, body shapes, etc.).

d. A subtle and outlined way of wording the body, of allowing it to escape from the cave of bodily silence to come to manifest itself as one of the active ways of managing subjectivity.

e. A really interesting and productive controversy between the Flesh and the Word that translates into vital exercises of connection, disconnection or structuring by the subject from an integral and non-dichotomizing anthropological dimension.

f. As a record in the form of an archive that preserves our memory, the traces of our life recorded on the skin, in the organs, etc.

Bodygraphy would then not be a technique (as in some cases we have been able to perceive), but in a very simple way we can understand it as the possibility that bodies be read from the cultural point of view. And it is here where language necessarily appears and what through language bodies mean, dignify, say, speak, communicate, silence or bodygraphy. Bodies that through language have ceased to be simple flesh and are, now, -although they do not want it- political bodies. For Ponce (2011) it is about:

> The trace as residue, as a form of absence. The verification of an existence. Marks FROM the body and ON the body. Signals in a space that feels weightless, unstable, slippery. Traces of the magnitude of a body that disappears in order to exist. The body proposed by Raquel Ponce is a body-image, body-screen-mirror, body-surface, body-contour. It explores the margins of representation, forces the significance of the trace, its ability to generate meaning through its own presence, in search of a body that is not only political and social, but a "body body", which results in its physical nature, executor, objectual and vehicular that activates to later become absence. Object and subject, the envelope of an interior that can never be seen. An entity that draws

its own trail and that trail is the very essence of what it was. The memory is what remains of the ephemeral (n.p., our translation).

As a final result of this work, I am interested in exploring the real possibilities of systematizing the idea of the body-archive.

3 EDUCATIONAL BODYGRAPHIES AND THE TEACHERS OF THE SENSIBLE

In this section I am going to focus on the analysis of a training experience carried out in the Master's of Psychopedagogy (at the Universitat Oberta de Catalunya in Barcelona, Spain) through an exercise of body-visual self-representation of the students. Most of the participating students had previous qualifications linked to the area of education (preschool or elementary school teachers) and continued their training with a master's degree to broaden their knowledge and their professional development horizons. Initially, the students had to describe, in a narrative, some essential issues that directly concerned their bodily experience in the training and educational contexts, focusing on the construction of masculinities in which they had been immersed. These experiences referred to how they had lived "incarnately" being part of the category "students" now that they were on the other side, practicing as teachers. The written production of this exercise had some limitations so that, later, we transferred the production and recording of said narration to what we call bodygraphies through a visual format.

The Work studied about 50 bodygraphies made by the students (males) of the aforementioned Master's degree, as part of an exercise of self-representation and pedagogical record in audiovisual format. We can understand audiovisual bodygraphy as the way of writing, registering or expressing the life of the subject in a format that can go beyond mere conversation or the word that is <lost in the wind>. The Work shows two great perspectives: a) how, through the exercise of audiovisual bodygraphy, the studied male subjects become aware of their formation and corporal transformation; b) the way in which, recording their life trajectory and their experience, they build personal positions aligned with what we have agreed to call "sensitive masculinity".

Specifically, the practice we described and analyzed in this article began when asking the question: How has your school bodygraphy been? after offering the students a series of texts that would allow them to reflect on their experiences. Thus, the master's students had to make a symbolic and visual representation of their trajectory, their process, the marks that Education left on their bodies in the form of furrows, scars, gestures, looks, postures, distances, silences, fears, ways to be present in the exercise of teaching etc., responding to the invitation they received from the teaching staff.

We invite you to rethink the body at school, vivifying it to understand ourselves is the exercise that we propose to you. It is about making an audiovisual product (3-5 minute long), which would have the generic title: «My school bodygraphy». It is about drawing a map, a story, an autobiography, yours, of senses and sounds, smells, touches, tastes and colors that explains your bodily experiences throughout your time at the various educational institutions and you can relate to the different paradigms that we have worked on throughout the subject.

With this activity I invite students each semester to think about their bodily identity (both as subjects and as educators) and not only to think but also to record it, to file it in a certain format to register it beyond the moment of the thought. This is how it happens in life itself, we realize that people are also "reading bodies" (not just disembodied minds); and as reading bodies we have the ability to deviate, to twist, to become abnormal and strange, inadequate or diverse. In this sense, we become sensitive beings, we let our affections impact us (Fallas-Vargas, 2019). As learners first, and then educators, we think about the body, we think with the body, we think from the body and we have the power to resignify educational praxis. From this perspective, the students show, through the bodygraphies they carry out, their experiences and answer the question they had asked their senses about what going through the educational system meant for them.

A bodily experience linked to the senses appears repeatedly in most of the bodygraphies, especially noticeable in relation to smell, through odors. Thus, for example, various students adduce and refer to the perfumes that have accompanied them throughout their educational stage and the role they have played. Smelling is, after all,

recognizing the other by the perfume they give off and, in fact, it is an ancient way of exercising human relationships (Planella, 2017a). What happens is that, with the purification of bodies in contemporary society, odors have been denied, have been erased, and have been conceptualized as something negative that people must repudiate.

Figure 2: *Bodygraphy* Composition (UOC Virtual Campus)
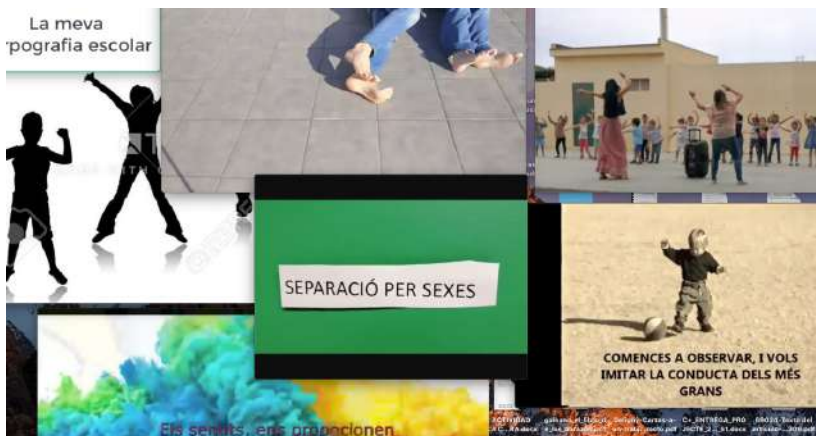
Source: Jordi Planella (April 2021)

The body is a true "agent of meaning" and, through it, territories and borders are marked in relation to other bodies. However, fighting against this conception is difficult, especially during childhood and through the experiences life goes through at school. Who does not remember the perfume of a teacher? Who does not also remember the smells of the school? Good smells or bad smells, but always present (despite all the actions carried out to deny them) because the body (despite the work of control) has not been able to control and eliminate something as vital as the sense of smell; even though the school has tried. For example, a student comments subtly, with a faint voice, almost in silence: "the teacher put cologne on us when we came back from the patio" (Story 2). This reminds me of the story of the teacher's perfume that Adelina Ecceli tells:

> I had been inspired by my teacher. It was wartime and she was always punctual, she always came, she always

gave off a good smell that only she had. I was little and always sat in the front row. Her perfume always enveloped me and I could still recognize it. During the war there were no perfumes or soaps and the nose was more sensitive to smells. I always keep little bottles at home because I think that if there were to be a war again it is one of the things to have. That smell was not of destruction, it was preserved from before the destruction even during the war. (Zamboni, 2002, p. 20, our translation).

The participants in the studied bodygraphies talk about their olfactory memory at school, considering both good and bad memories. Among other examples, some mentions related to everyday objects and elements within the school context were made, such as the smell of a sandwich and its ingredients (chorizo, ham, tuna), the smell (and sound) of chalk on the blackboard, the pleasant smell to plasticine, to glue and paints; the smell of new books (linked to other ideas or sensations since *"it indicated that we were older"*), the smell of Nenuco and "wipes" in early childhood education or the smell of the eraser (Stories 4 and 5) . For another participant, that memory is specified in: *"the smell of new books, sparkle cologne, smoothies and juices we drank on the patio"* (Story 3). It also alludes to the smell of different spaces such as the biology laboratory (Story 3), to the stench of the bathrooms (Story 6), to the classrooms with a strong adolescent smell after hours with the door closed (Story 4), or the strong body odor at the entrance to recess (Story 2), the smell of the school garden in natural science activities (Story 5), as well as the smell of dirt in the schoolyard or the smell of chlorine of the pool (Story 1). All this refers to what is stirred in these students, and the relevance that the senses, and especially smell, generate and have generated in their training as people and as teachers.

In almost all the stories there is a vision of the body as an act of freedom, especially in the case of some specific stages. Early childhood education, which they received between the ages of three and five, the period prior to compulsory schooling, stands as the stage par excellence. In the development of schooling processes there is a clear break in the ways of teaching between elementary and high school. In it, acts of micro-resistance are also perceived in the high school

stage, when the students were in full adolescence and was between 12 and 16 years old. This process of emancipation, of liberation from the captivity to which the body has been subjected, has been treated individually and sometimes collectively. In any case, the students have shown how, during their formative stage, they tried to break with the normalizing disciplines and thus regain their freedom.

From the reading of some texts, by authors such as Gloria Anzaldúa, Val Flores, Ricard Huerta, Urko Gato, Asun Pié, Gayatri Chakravorty Spivak, the participants reflected on the experiences of their bodies in schools and how they have transited and transformed their lives from underlying studies, Chicano pedagogies on the border, the marks of education on the skin or the pedagogy of torn flesh. This reading and subsequent reflection, which takes voice in their bodygraphy, allows students to be placed in another position, now as educators. In this way, the bodygraphies show how the students have been able to redirect those lines that, until now, seemed rigid, immovable and unquestionable. For example, one of the bodygraphies said that *"In my case, many recreations and excursions were spent with them, with the girls. I really liked being with them, I had a good time"* (Story 6). It can be seen here how freedom of movement appears as a certain divorce from normality, as an action that is out of the ordinary or expected. For others, the radicalism of the adolescent body in school devices was taken to the extreme: "I punished my body with drug use and it was then when I got my first tattoo; later I gave up drugs, but I haven't stopped getting tattoos" (Story 1).

This position that seeks the liberation of the body, which emerges as something projective, and presents a future line towards which they would like to direct their professional work. Thus, a student states that *"now that I work as a teacher I seek this position of sensitive pedagogy, of the pedagogy of resistance where I can be and act from another position, from another masculinity"* (Story 2). In this way, the bodygraphies testify how students are capable of connecting or reconnecting through sensory navigation through childhood.

Finally, the students show, through the bodygraphies, they want to break with certain pedagogical lines that, until now, seemed unquestionable; and want to do it in different ways, remembering and/or following that teacher who once guided them, like smugglers, along

the energetic path of a pedagogy that woke them up from anesthesia.

4 SKIN-DEEP BODYGRAPHIES

In the field of bodygraphies, the issue related to the <permanent record> emerges and that, among other possibilities, can take the form of a tattoo. The skin thought and assumed as the largest organ of our body (despite our great ignorance of it), it thus appears as a drawing, but essentially refers to life itself, to the prevailing and unstoppable desire to transfer a message from the mind to the flesh, a word forcefully transmuted through ink. We learn to write with a pencil, graphite, and little by little we move on to writing (already indelible) made with ink. There is a clear connection of writings: writing with ink on paper and incorporating ink (also permanent) on our skin.

Figure 3: Tattoo of one of the participants in the Seminar on bodygraphies
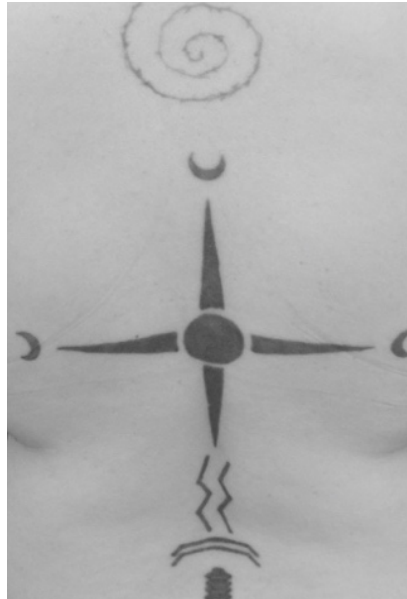
Source: Jordi Planella (Porto Alegre, 2015).

Figure 4: My first tattoo

Fonte: Jordi Planella (2017).

Figure 5: Blurred tattoo of a rose from an unknown person

Source: Jordi Planella (2019)**.**

In relation to the tattoo, I have written in one of my *Diaries*:

> I have spent years with the irrepressible desire to move from the theoretical to the practical. I have written, researched, spoken and trained many educators about the body, but sometimes I have the feeling that I do not live in the body. No, this time I am not going to resign myself, to stay in a cold academic level. When I presented my doctoral dissertation in January 2004, my wish was to tattoo the Vitruvian man (Leonardo da Vinci) on my back, and when I finished my presentation and defense, unbutton my shirt and show the examiners the B-side of my dissertation: my tattooed back. I could not. Something, surely internal, stopped me. But that desire grew uncontrollably until 2017, when I was almost fifty years old, and I decided to allow the needles and ink to cross the pores of my skin for the first time and make my flesh a word (Planella, 2017b)

Many elements are mixed there, some of them answer questions that have to do with one's condition: Is a tattoo compatible with being a University Professor? Is a tattoo compatible with being a father and being 50 years old? The questions fall by themselves, because they are absurd and normalized of myself, since they had arisen as a result of that pedagogy that had been instilled in me but at the same time as a result of the experienced academic environment. It is no coincidence that one of the people in charge at my university asked me if it was a tattoo with permanent ink (hoping my answer would be negative). Break the line and get out of the herd, so that something similar happens to us. We have been programmed with schemes, with stereotypes based on archetypal models about what is expected of one at certain moments in life or in certain positions of the chosen profession. For Doederlein (2017, p. 161, our translation) the tattoo is a:

> It is a scar the soul closes.
> It is a birthmark that life
> has forgotten to design and that the needle has not.
> It is when the blood turns into ink.
> It is the story I do not tell with words.
> It is the painting I decided not to hang on the wall of my house.

It is when I wear my bare skin with art
Tattoo[1]

In a doctoral dissertation I co-supervised at the Autonomous University of Chiapas, we investigated the marks on the skin of adolescents who were incarcerated in the Villa Crisol detention center (*Jóvenes desde la periferia: experiencias corporales de la delincuencia y las violencias*, Miranda, 2018). It was the same type of record as mine, but in this case the development of a certain form of resistance to the prison system that co-invests one in number, in mass, in no one. For García Selgas (1994, p. 48, our translation), it is relevant to think that the body "stops being seen as a mere physiological organization or a support, a machine inhabited by a spirit, to become the lived experiential structure". And it is precisely in this "becoming a structure" that there is a turn towards the idea of the body-archive (or as Miranda defends in the aforementioned work, of the body-place). Some testimonials speak directly:

> - Yes, most of them I did there. There are some tattoos I did myself, and there are others fellow inmates did for me. I already had this one on my hand and my comrade over there made it for me (…) There are some that have meaning, others because I wanted to try the machine, to know what lines the machine throws also to learn a little, to know how the pulse is. I practice on my own skin (Story 7, Miranda, 2018, p. 164, our translation).

> -Tattoos are unforgettable memories, brother, memories of the course of your life: if it's important to you, you have it tattooed, you remember it well (…) Each tattoo I bring here are memories that drive me to move forward (Story 8, Miranda, 2018, p. 142, our translation)

> -Yes, between tattoos, there are many differences; for example, a gang tattoo, it's practically so visible, you see an MS or an 18. Nowadays everyone knows what

---

1   tatuagem (s.f.)

É cicatriz que a alma fecha. / É marca de nascença que a vida / se esqueceu de desenhar, e a agulha não. / É quando o sangue vira tinta. / É a história que eu não conto em palavras. / É o quadro que eu resolvi não pendurar na parede da minha casa. / É quando eu visto minha pele nua com arte.

the three points are: the points of crazy life; hospital, jail and pantheon (Story 9, Miranda, 2018, p. 166, our translation).

Figure 6: Prison tattoo

Source: Adrian Miranda (2018).

But despite these stories arising from a prison context, we can affirm that, in general, body marks are no longer written with *"Mother's Love"* or *"My girlfriend is death"* that years ago we could read in the strong arms of the military of the Spanish Legion, of the sailors or of the prisoners of the penitentiaries. It is true that in these contexts tattoos have a specific function and that we cannot ignore it. For Álvarez-Uría (1999) the body, in certain contexts of social control, becomes absolutely necessary textuality and subjectivity:

> In praise of physical strength and beauty, an expression of secret desires, of persistent dreams on sleepless nights, an obscene manifestation of the difference that reduplicates the muscles, tattoos are, above all, unspeakable lamentations for impossible loves that speak, in the prisoners' bodies, a language of pride and insubordination, are a sign of that identity that cannot

> be annulled, of a subjectivity that cannot be erased with physical punishment, nor with ceremonial degradation of the self, nor with psychological punishment. (Alvarez-Uria, 1999, p. 109, our translation).

Although tattoos, within the prison framework, continue to play an essential role in the psychological resistance of inmates in relation to the deprivation of liberty, outside its walls they have begun to take on a new social and personal dimension. From the last decade of the 20th century, tattoos have come out of the ghettos and embrace a new audience. The tattoo, as an exponential reference to the idea of the body-archive, is related to the forms of enunciation of the subject's personality. They are related to the one proposed by Migliore (2018, p. 29, our translation) "la pelle è stata giustamente coinsiderata il luogo della semiosi fra somatico e semántico, l'interfaccia superficie/profundità, ma prendendo a riferimento un "io psichico" che rimane non semiotizzato" . The tattoo is located in this dimension of new sensitivities, of masculinities on the edge of their own categories, seeking other languages, other words, other excesses.

For young people, adolescents and adults, in a world in which many things disappear quickly and are ephemeral, the tattoo represents permanence which does not expire and persists and accompanies them throughout life on their skin. The aesthetic search through the tattoo has at the same time the objective of a search for originality (to differentiate from others), to search for and present to the world a different and unique body. This search for originality through the body tattoo has a special meaning for young people, because "when asked about its meaning, young people of both sexes pronounce some mysterious words: freedom, love, night, death, fear, memory recall" (Álvarez-Uría, 1999, p. 110, our translation). It becomes evident through the "inscription", of the body writing, that the values mentioned by young people can be recovered.

> I take a deep breath, today the needle with dark ink will go through my skin for the first time. The skin, the largest organ of the human being and at the same time that great unknown, will be the canvas on which the tattoo artist will record the furrows, the stories, the narratives and the screams of part of my life. Skin

as a commitment to oneself, but at the same time skin as something I want to show the world. Piel, pell, pelle, skin, pele, haut are words that, in the light of the ink strokes, take on a different meaning in different geographies and languages. Perhaps it is an extreme, performative, scriptural, embodied dermatology that serves me as a symbolic practice and as a register of the self. (Jordi Planella, 2017b).

5 FINAL CONSIDERATIONS

 The body, beyond anatomies, physiology or flesh is inscribed in the lives of the subjects from the category of the body-archive. To this end, I have analyzed two ways of exercising this condition: the development of audiovisual bodygraphies by a group of master's students and the forms of body writing through tattooing. In both cases I have studied how, through these exercises, socially constructed conceptions of masculinity have been naturalized throughout their educational journey. These social constructions, otherwise, respond to certain socio-historical educational contexts, built mostly on the basis of hegemonic power relations. But the most important thing is that the awareness of these situations unfolds a set of elements of resistance that materialize in the body-archive and in the development of what we can call "sensitive masculinities".

In the master's students' case, their educational experiences have greatly favored the construction of the participants' masculinity, based on a certain model. In particular, from the analysis of the audiovisual exercises an invitation emerges to overcome the conception of classical masculinity, outlining alternative paths for new teaching masculinities. Specifically, the results point to the existence of two great pedagogies underlying the formation of masculinities embodied by the participants and represented in the bodygraphies. On the one hand, an anesthetic pedagogy, based on virility (manhood) as a hegemonic form. And, on the other hand, a sensitive pedagogy, capable of incorporating alternative and varied conceptions, open to the emergence of new teaching masculinities.

To unfold the corporal presence of the educators in front of a camera, to begin to narrate (but at the same time to narrate

themselves) to become aware, to reconstruct a personal itinerary of the received corporal education, of the effects of certain pedagogies on their lives and their bodies has been one of the key analyzed elements. Through the exercise of audiovisual self-representation, the participants showed the devices that have exerted acts of micro-violence on them, but at the same time they have revealed their own acts of resistance. Resisting to build new teaching forms, masculinities open to other categories that propose a transformation of the roles of citizen, of strong "macho" and that allow, in short, to think about education from another perspective. Based on the results, the work questions the archetype of masculinity traditionally promoted from the educational field, tracing lines of escape for new teaching masculinities.

In the case of tattoos, something fundamental appears repeatedly: putting into play, recovering the body's own sensitivity. In the exercise of "tattooing" or to be more precise of "being tattooed", a corporeal exercise that takes the subject to a deeper dimension of their bodily experience is also developed. Words like skin, written word, pain, ink encompass a new semiotic that allows, if the subject so wishes, to move towards a space of sensitive masculinity, another way of living and exercising that masculinity. Because precisely through the ink shown something of that "man" is revealed who wants to write and inscribe himself as different, more sensitive and who is willing to sacrifice part of his pristine skin to record it.

When the ink crosses our skin for the first time, that first wound, that blood that spurts out when the needle -in the ritualized process of inscribing the word on our skin- sticks into us, makes us human, or perhaps more human. I am not sure that it is that "infinite wound" that Esquirol (2021, p. 13) tells us about, but we can be very close to it. To be human and to be from a sensitive position to transfer and register culture in the nature of our bodies, I think that is the true essence of the idea of the body-record.

REFERENCES

Alba, S. (2019). *Ser o no ser (un cuerpo).* Barcelona: Seix Barral.

Álvarez-Uría, *F.* (1999). Tatuajes. *Archipiélago*, 37, 107-112.

Azcona, A. (2020). *Acto de desobediencia.* Lleida: Editorial Milenio.

Caballero, A. A. (2014). Comunicación y subversión: estudios de género desde la cultura visual. Aportes de la Teoría Queer y los Estudios Visuales. *Journal de Comunicación Social*, *2*(2), 95-119.

Deleuze, G., & Guattari, F. (1988). *Mil mesetas.* Valencia: Pre-textos.

Doederlein (2017). *O livro dos significados.* São Paulo: Paralela.

Esquirol, J. Mª. (2021). *Humà, més humà: una antropologia de la ferida infinita*. Barcelona: Quaderns Crema.

Fallas-Vargas, F. (2019). Cuerpo, naturaleza y rebelión: el componente somático en el pensamiento de Adorno y en la dialéctica negativa. *Bajo Palabra: Revista de Filosofía*, *2*(21), 19-38.

García Selgas, F. (1994). El cuerpo como base del sentido de la acción. *Revista Española de Investigaciones Sociológicas*, *68*, 41-84.

Henry, M. (2018). *Encarnación: Una filosofía de la carne.* Salamanca: Sígueme.

Ledo, M. (2020). *El cuerpo y la cámara*. Madrid: Cátedra.

Memmi, D., Guillo, D., & Martin, O. (Ed.). (2009). *La tentation du corps: corporéité et sciences sociales.* Paris: Éditions de l'EHESS.

Migliore, T. (2018). Tatuagi blasoni del me. L'enunciazione dalla persona alla personalità. En G. Marrone, & T. Migliore (Ed.). *Iconologie del tatuagio. Scritture del corpo e oscillazioni identitarie* (pp. 29-58). Milano: Meltemi.

Miranda, A. (2018). *Jóvenes desde la periferia: experiencias corporales de la delincuencia y las violencias* (Tesis Doctoral). Tuxtla Gutiérrez: Universidad Autónoma de Chiapas.

Mondzain, N. J. (2011). Nada Tudo Qualquer coisa. In R. Silva & L. Nazaré (Ed.). *A República por vir.* Lisboa: Fundacçâo Calouste Gulbenkian.

Passos, E., & De Barros, R. B. (2009). A cartografia como método de pesquisa-intervençâo. In E. Passos, V. Kastrup, & L. Da Escóssia, L. (Ed.). *Pistas do método da cartografia. Pesquisa-intervenção e produção de subjetividade* (Vol. I, pp.17-31).

Planella, J. (2006). Corpografías: dar la palabra al cuerpo. A*rtnodes: revista de arte, ciencia y tecnología*, (6), 13-23.

Planella, J. (2017a). *Pedagogías Sensibles. Sabores y saberes sobre el cuerpo y la educación.* Barcelona: Publicaciones de la Universidad de Barcelona.

Planella, J. (2017b). *Diarios Personales.* Girona: Material no publicado.

Ponce, R. (2011). *Corpografías.* Tenerife: Exposición de arte.

Trosmann, C. (2013). *Corpografías. Una mirada corporal al mundo*. Buenos Aires, Topía.

Zamboni, Ch. (2002). Adelina Eccelli: la universidad es mi pueblo. In A. Eccelli. *El perfume de la maestra. En los laboratorios de la vida cotidana.* Barcelona: Icaria.

C H A P T E R 2

FEMALE LEADERSHIP IN THE EMERGING FIELD OF DIGITAL CURATION*

MARÍA-ANTONIA OVALLE-PERANDONES
Universidad Complutense de Madrid

MIRELYS PUERTA-DÍAZ
Universidade Estadual Paulista

DANIEL MARTÍNEZ-ÁVILA
Universidad de León

ABSTRACT

In this text we analyze the field of digital curation from a gender perspective. We conducted an analysis of the domain until 2020 using mainly bibliometric techniques. We worked with the main reference source in the area, according to the scientific consensus, that is the International Journal of Digital Curation (Miguel et al., 2013), as well as international databases to identify other publications that cited this important source. We obtained, from these sources, an exhaustive list of all the authorship data to identify the gender of the authors (male or female) and the concept of leadership based on the corresponding author.

Keywords: Digital curation, domain analysis; female leadership.

RESUMEN

En este capítulo se analiza el campo de la curación digital con una perspectiva de género. Se realiza un análisis del dominio hasta 2020 haciendo uso, principalmente, de técnicas bibliométricas. Se trabaja con la principal fuente de referencia en el área según consenso, International Journal of Digital Curation (Miguel et al., 2013), y bases de datos internacionales para identificar otras publicaciones que citan esta importante fuente. De estas fuentes se obtuvo una relación exhaustiva de todos los datos de autoría para después identificar el género (masculino o femenino) y trabajar con el concepto de liderazgo a partir del autor de correspondencia.

Palabras clave: Curación digital, análisis de dominio, liderazgo femenino.

1 INTRODUCTION

Digital curation or content curation is an emerging professional field, emerging in the context of the web content publishing proliferation, and Web 2.0. The Digital Curation Center (DCC) defines the concept as one that has the quality of bringing together the different tasks of management, classification and organization of digital assets throughout their useful life, from the moment of their conceptualization, to their use as active elements, and caring for their preservation so that they can be presented and used in the long term from their preservation site (Rusbridge *et al.*, 2005). In the professional manifesto of content curation (Bhargava, 2009), the object is defined as the search, grouping, organization and sharing of the most relevant content on a specific subject.

As a professional field increasingly linked to research due to the very nature of using electronic environments to disseminate research, DCC provides expert advice and practical help on how to store, manage, protect and share digital research data. It offers a wide range of resources, including online tools, guidance and training. And it provides consulting services in aspects such as policy development and data management planning. As a knowledge domain, digital curation has been disputed by the areas of digital marketing, journalism and communication, engineering and computing, information and documentation or education, among others (Guallar *et al.*, 2020). In any case, since the object of study is linked to technologies, women are at risk of being excluded from their scientific sphere, traditionally rooted in rationalist and positivist positions to which the dominant classes had privileged access.

In this sense, the aim of this chapter is to analyze the scientific leadership of women in the emerging field of digital curation. For this, the main source used is the electronic scientific journal International Journal of Digital Curation (IJDC), specialized in the publication of works, articles and news about the digital object preservation and other related topics. Although some works carried out bibliometric studies of academic production on digital curation (for example, GUALLAR *et al.*, 2020), no previous study has been carried out with a gender perspective.

On International Women's Day, March 8, 2021, the value

of female leadership was highlighted. In the context of any field or domain, scientific leadership measures the production of a given unit of measurement as the main contributor, that is, the part of the production in which the author of correspondence is in that unit of measurement (Moya-anegón, 2012). The present chapter aims to show whether this value transcends in a field as emerging as digital curation or if, on the contrary, the barriers we associate with a particular tradition remain, whether structural or cultural (Meiksins *et al.*, 2019), distancing from a certain scientific equity between the two genres (Palomba, 2006).

2 METHODOLOGICAL PATH

Methodologically, the investigation uses bibliometric techniques to analyze the digital curation domain with special emphasis on women's role, contributions and characteristics in the epistemic community that make up the analyzed domain. Domain analysis as a theoretical-epistemological paradigm was introduced in Information Science in 1995 (Hjørland & Albrechtsen, 1995). Subsequently, Hjørland (2002; 2017) listed bibliometrics as one of the ways to approach domain analysis and has been satisfactorily worked on in several studies (Smiraglia, 2015).

The present work uses bibliometrics to analyze the digital curation domain based on the scientific production of the period 2007-2020. As primary research source it works with the scientific journal specialized in the field of digital curation, the International Journal of Digital Curation. In the context of Information Science and domain analysis, several studies analyzed a domain from the production in a specialized journal (Smiraglia, 2012; Miguel *et al.*, 2013; Guimarães *et al.*, 2015; Oliveira *et al.*, 2017; Alves *et al.*, 2019; Martínez-Ávila; *et al.*, 2020). The relationship between journals and domains is explained by Smiraglia (2015, p. 9) in the following terms:

> Journals are the formal venues for most scholarly communication, and studying them as whole works is also one means of identifying productive elements of a research front. Of course, few journals are devoted to topical areas that are narrowly defined as most domains under study. For example, even in the field of knowledge organization, the principle journal Knowledge

Organization is devoted to the entire field. Thus it would likely be the most cited journal in all domains within KO, but there are no journals devoted to specific narrow aspects of KO, such as "integrative levels", "multilingual thesauri" or "ethics in KO".

The second main source of the research was Google Citas, used to identify the publications that cite the works published in this specialized magazine. The combination of the two sources provided an exhaustive list of all authorship data and the identification of the genre associated with the authors' names (male or female) to analyze women's scientific leadership according to the role of the corresponding author (Moya-Anegón *et al.*, 2013).

To obtain the records, the free software Publish or Perish (PoP) v.7 was used. PoP allows extracting publications directly from Google Scholar, where the journal is indexed. The used search strategy consisted of placing the title of each publication between quotation marks in the PoP *title words* field. Subsequently, with a bibliographic manager, the data were cleansed and some data omissions were completed by consulting the primary source available on the journal's official website. The authors' gender was identified by consulting the Gender API platform, whose database contains 6,084,389 validated names from 191 different countries. Gender data were exported in .csv format for further processing and integration into the co-authorship network.

3 CHARACTERISTICS OF THE FIELD OF DIGITAL CURATION

3.1 Temporal evolution

In the IJDC journal, 454 works were published in the period from 2007 to 2020. This means that, on average, 32 works are published annually. The trend is to publish a similar number of works, although in some years such as 2010 or 2019 there was a decrease justified by the publication of a single issue in the year. However, a few years ago, even having published a single issue, a large number of publications were concentrated in it, as in the year 2020.

Figure 1: Frequency of publications per year (2007-2020)
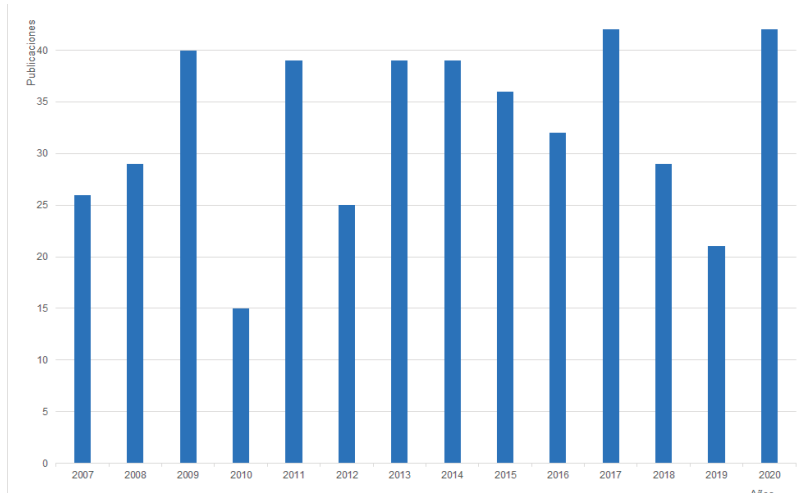
Source: by the authors with Microsoft Excel.

3.2 Title terms

The word cloud of terms used in the titles of all works published in the IJDC is presented, without considering empty words and terms that, although more frequent, are those expected to be found considering the theme of the journal. The most frequent terms, preserving the original language, are: data (273), digital (107), research (98), curation (84), management (73) and preservation (70).

The authors confirm that the thematic coverage of the journal can be defined, both by those terms not included in the word cloud, in addition to *study, case, towards, science, approach, information, scientific, challenges, university, building, metadata* and *education*. Figure 2 includes a total of 1257 title terms. Size meets frequency and is represented with a different color to improve understanding of the cloud.

Figure 2: Cloud of terms included in the titles of articles published in the IJDC
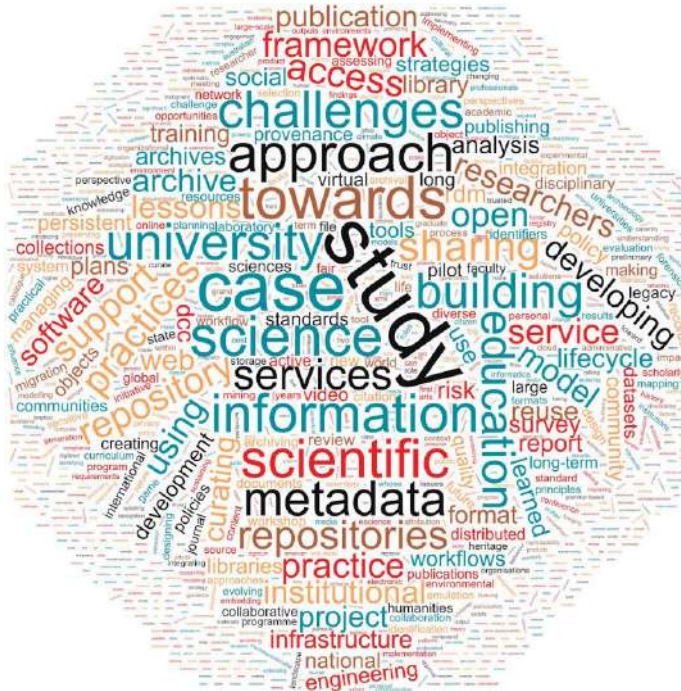
Source: by the authors with Word Cloud Generator.

3.3 Authors' Production

The research elite was calculated based on Price's law, considering that "the number of prolific producers is equal to approximately the square root of the total number of authors in the field" (Price, 1976, p. 3). The formula for √1044 researchers corresponds to approximately the 32 most productive authors. Table 1 (female authors in bold) lists the 21 authors with more than 5 publications.

Table 1: List of authors that make up the research elite

Author	Total of publications
Jones, Sarah	11
Ball, Alexander; **Lyon, Liz**; Matthews, Brian	9
Ludäscher, Bertram; Whyte, Angus; Donnelly, Martin;-Treloar, Andrew; **Callaghan, Sarah**	8
Brown, Geoffrey	7
Snow, Kellie; Pryor, Graham; Abrams, Stephen; Carlson, Jake; **Molloy, Laura**	6
Day, Michael; Tedds, Jonathan; Mayernik, Matthew S.; **Willoughby, Cerys;** Knight, Gareth; Missier, Paolo	5

Source: by the authors.

Among the most productive authors in this emerging field, the English researcher Sarah Jones from the Digital Curation Center stands out, with a total of 11 publications. Her studies address the main concerns regarding data management, especially specializing in research on the implementation of data management policies and plans in institutional contexts.

3.4 Co-authorship Networks

The co-authorship network is composed of 1044 nodes. The relationship matrix is symmetrical and weighted. Symmetrical as an author cannot co-author with others without the others being co-authors of that author. It is weighted, considering the number of occasions on which co-authorship between authors occurs. Punctual relationships or with a single document create 2483 relationships in this network; in two or more documents, 182. These authors establish a total of 2665 relationships. From the gender point of view, Figure 3 represents in black the nodes with male authors (628 nodes); and in white the nodes for female authors (416).

Figure 3: Co-authorship network of the journal IJDC for
the period 2007-2020
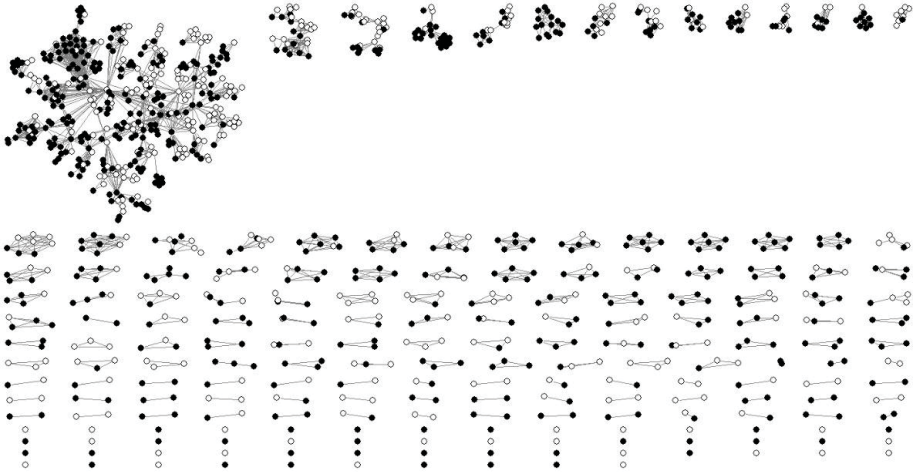
Source: by the authors with Pajek.

In the same figure and at the bottom, the isolated nodes are shown. In this network, isolated nodes correspond to authors who have never collaborated with any author. This occurred with 52 authors. In the upper left, the main component is clearly identified. Among the 192 components or subnets of the entire IJDC co-authorship network, 380 nodes are connected to this component.

Figure 4: Main component of the IJDC co-authorship network in
the period 2007-2020
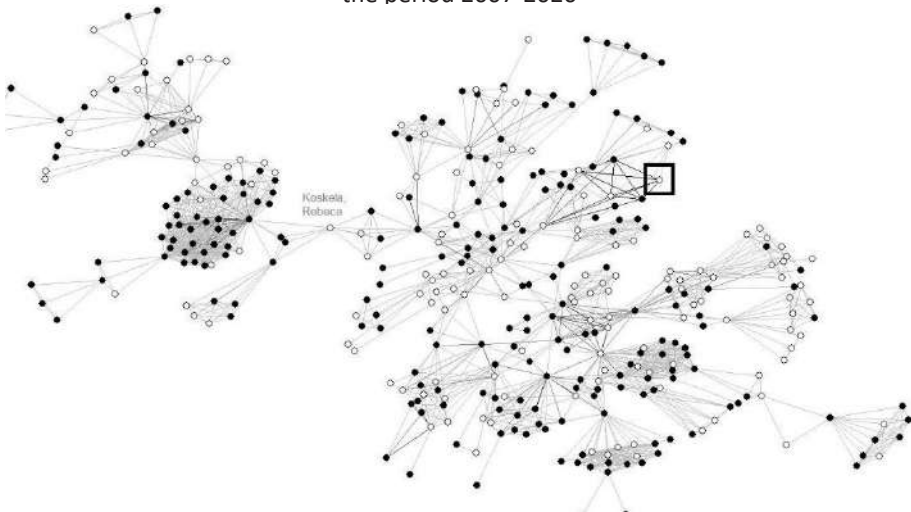
Source: by the authors with Pajek.

As indicated, the subnetwork included in Figure 4 is composed
of 380 nodes (226 linked to the male gender; 154 to the female gender)
and a weak link is clearly identified in white (corresponding to the
author Koskela, Rebeca, once she disappeared, the network would
become more fragmented). Rebeca Koskela fulfills the function of
connecting the upper left group, which is smaller in size, with the
right group, which is larger in size. This author connects with author
Bertram Ludascher, the author with the highest degree in the network
(49). As was the case across the whole network, the most frequent
co-authorship relationships in the network occur on one occasion in
1560 of them (light gray); while on more than one occasion it occurs
in 140 relationships (dark gray). Thus, the co-authorship network
generated by author Kirsty Merret, in the upper right corner (marked
by a small square), is the one that occurs the most.

3.5 Citation dynamics

Figure 5 (female authors in black and male authors in gray) shows the works that received more than 80 citations, identified on the X axis by reference. If we analyze the impact of publications, among the 20 most cited works, 6 articles received more than 100 citations and whose authorship composition is led by the female gender. In this indicator, author Sara Higgins obtains the first and third highest number of citations received for her works. Discussions about the emergence of Digital Curation as an emerging discipline and its proposal for a lifecycle model constitute theoretical pillars of this scientific field.

Figure 5: List of works with more than 80 received citations
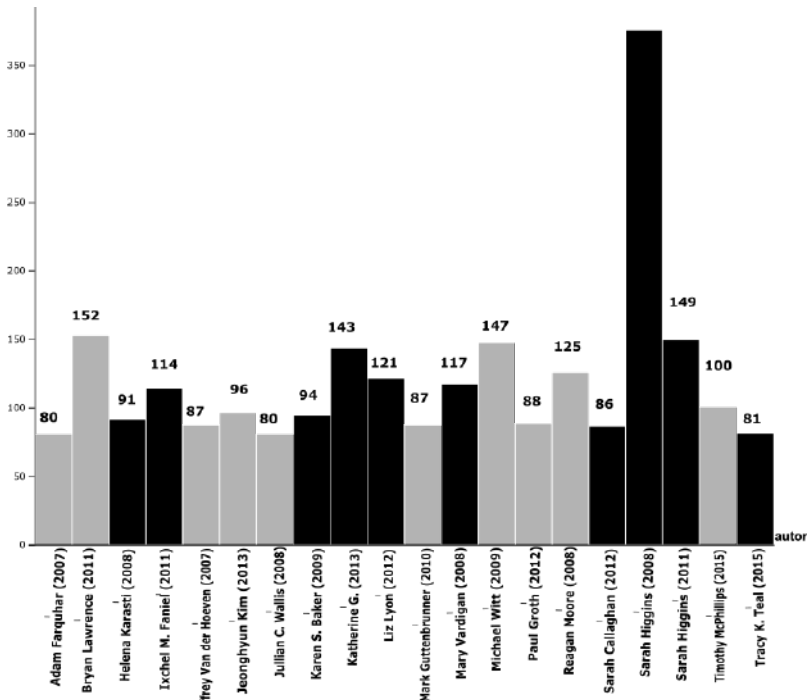
Source: by the authors with RawGraph and Inkscape.

3.6 Science and Leadership

The analysis of women's scientific leadership in the emerging field of digital curation as the main contributors to the domain allows us to affirm that women have been authors of correspondence (Moya-Anegón, 2012) in greater proportion than male authors. Analyzing the 92 articles published in the IJDC in the triennium 2018-2020, in 37 of them the corresponding authors were men (third column of Table 2), and 54 were women (second column of Table 2), in addition to an article whose corresponding author was an institution.

Table 2: Scientific leadership in the works published in the IJDC in the 2018-2020 triennium

Year	Scientific leadership women	Scientific leadership men
2020	25	16
2019	10	11
2018	19	10

Source: by the authors.

4 CONCLUSION

Gender disparities in science are a reality (Larivière *et al.*, 2013), however, the digital curation domain shows signs of a small shift in this trend. In the analyzed period, Sarah Jones is the most productive author; Rebeca Koskela plays the role of a node to expand the cohesion of the network; and Kirsty Merrett often works collaboratively given the bond derived from co-authorship; the fact that they are all women contradicts the expected trend (Kwiek & Roszka, 2020). The year 2020 is highlighted by the important change in the dynamics in relation to the IJDC authors as it was the moment when they most frequently performed the functions of scientific leadership.

REFERENCES

Alves, B.H., Dalessandro, R.C., & Santos, F.B.d. (2019). Colaboração Científica no Periódico Knowledge Organization: Elementos para Caracterização de um Domínio. In T.H.B. Barros & N.B. Tognoli (Eds.), *Organização do Conhecimento Responsável: Promovendo Sociedades Democráticas e Inclusivas* (pp. 137-144). Ed. da UFPA.

Bhargava, R. (2009). *Manifesto For The Content Curator:* The Next Big Social Media Job Of The Future?. https://www.rohitbhargava. com/2009/09/manifesto-for-the-content-curator-the-next-big-social-media-job-of-the-future.html

Guallar, J., Codina, L., & Abadal, E. (2020). La investigación sobre curación de contenidos: análisis de la producción académica. *Ibersid,* 14(1), 13-22.

Guimarães, J.A.C., Martínez-Ávila, D., & Alves, B.H. (2015). "Epistemic Communities in Knowledge Organization: An Analysis of Research Trends in the Knowledge Organization Journal." In *ISKO UK biennial conference* 13th–14th July 2015, London.

Hjørland, B. (2002). Domain analysis in information science: Eleven approaches – traditional as well as innovative. *Journal of Documentation,* 58(4), 422-462 https://doi. org/10.1108/00220410210431136

Hjørland, B. (2017). Domain Analysis. *Knowledge Organization,* 44(6), 436-464.

Hjørland, B., Albrechtsen, H. (1995). Toward a new horizon in information science: domain-analysis. *Journal of the American Society for Information Science,* 46(6), 400-425.

Kwiek, M., & Roszka, W. (2020). Gender Disparities in International Research Collaboration: A Study of 25,000 University Professors. *Journal of Economic Surveys*. doi: 10.1111/joes.12395

Larivière, V., Ni, C., Gingras, Y., Cronin, B., & Sugimoto, C. R. (2013). Bibliometrics: Global gender disparities in science. *Nature News,* 504(7479), 211.

Martínez-Ávila, D., Ibekwe, F., & Bochi, F. (2020). The Epistemic Communities and Evolution of Knowledge Domains: A Domain Analysis of the Journal Education for Information. In: M. Lykke, T. Svarre, M. Skov, & D. Martínez-Ávila (Eds.), *Knowledge*

Organization at the Interface (pp. 264-273). Ergon Verlag. https://doi.org/10.5771/9783956507762-264

Meiksins, P., Layne, P., Beddoes, K., Lewis, M., Masters, A.S., & Deters, J. (2019). Women in Engineering: A Review of the 2018 Literature. *SWE Magazine.* https://alltogether.swe.org/2019/04/women-in-engineering-a-review-of-the-2018-literature/

Miguel, S., Hidalgo, M., Stubbs, E., Posadas, P., & Jaureguizar, E.O. (2013). Estudio bibliométrico de género en la paleontología de vertebrados. El caso de la revista argentina Ameghiniana (1957-2011). *Investigación Bibliotecológica,* 27(61), 133-155.

Moya-Anegón, F. (2012). Liderazgo y excelencia de la ciencia española. El *Profesional de la Información,* 21(2), 125-128. http://dx.doi.org/10.3145/epi.2012.mar.01

Moya-Anegón, F., Guerrero-Bote, V.P., Bornmann, L., & Moed, H.F. (2013). The research guarantors of scientific papers and the output counting: a promising new approach. *Scientometrics,* 97, 421-434.

Oliveira, E.F.T.d, Alves, B.H., Prado, M.R.d., & Pavanelli, M.A. (2017). Produção Científica e Inserção Internacional da Revista Scire no Período de 2006 a 2014. *Scire,* 23(1), 47-56.

Palomba, R. (2006). Does gender matter in scientific leadership? *Scientific Careers,* 133-137.

Price DS. (1976). A General Theory of Bibliometric and Other Cumulative Advantage Processes. *Journal of the American Society for Information Science,* 292-306. doi: 10.1002/asi.4630270505

Rusbridge, C., Burnhill, P., Ross, S., Buneman, P., Giaretta, D., Lyon, L., & Atkinson, M. (2005). The Digital Curation Centre: A Vision for Digital Curation. In: 2005 IEEE *International Symposium on Mass Storage Systems and Technology* (pp. 31-41). IEEE. doi: 10.1109/LGDI.2005.1612461

Smiraglia, R.P. (2012). Shifting Intension in Knowledge Organization: An Editorial. *Knowledge Organization,* 39(6), 405-408.

Smiraglia, R.P. (2015). *Domain Analysis for Knowledge Organization:* Tools for Ontology Extraction. Oxford: Chandos Publishing.

CHAPTER 3

GENDER PERSPECTIVE ON
DIGITAL ENVIRONMENTS*

MARÍAN BLANCO-RUIZ
Universidad Rey Juan Carlos
Instituto Universitario de Estudios de Género (UC3M)

ABSTRACT

The chapter "Gender perspective on digital environments" addresses the challenges that arise in the digital context and how stereotypes, prejudices and discrimination are reproduced. One of these prejudices manifestations is symbolic violence through images: how women are represented in image databases? What effects do stereotypes have on the self-representation that people who use social network make of themselves? What implications does this representation have for machine learning? In addition, the different types of online violence that occur on digital media environments are analyzed, and the role played by the issue of anonymity and identity theft. Finally, the chapter concludes with a proposal to incorporate a gender and intersectional perspective into research on digital media and communication.

Keywords: Symbolic violence, gender stereotypes, digital media.

RESUMEN

Se abordarán los retos que se plantean en el contexto digital y cómo se reproducen los estereotipos, los prejuicios y la discriminación. Una de las manifestaciones de estos sesgos de género es la violencia simbólica a través de las imágenes: ¿cómo se representa a las mujeres en los bancos de imágenes? ¿Qué efectos tienen los estereotipos en la representación que hacen de sí mismos los usuarios de las redes sociales? ¿Qué implicaciones tiene esta representación para el aprendizaje automático? Además, se analizarán los diferentes tipos de violencia en línea que se producen en el entorno de los medios digitales, así como el papel que desempeña la cuestión del anonimato y la suplantación de identidad. Por último, se hará una propuesta para incorporar las perspectivas de género e interseccional en la investigación sobre medios digitales y comunicación.

Keywords: Violencia simbólica, estereotipos de género, medios digitales.

1 INTRODUCTION

The Internet is a reference technological source for domestic leisure, information and entertainment (Craig Watkins, 2009). In this context, the Manuel Castells's citation (2006) "Internet is the fabric of our lives" takes on even greater meaning, which refers us to a daily media routine in which thousands of people around the world share information and experiences, interact with their peer group through social network, while some of them are also content creators through different web platforms such as YouTube.

The gender perspective can be incorporated into any field, and the digital environment is one of the recent fields in which its application has evidenced the reproduction of patriarchal structures in a context of "ones and zeros" which, despite "the novelty" of its creation, reproduces and creates gender inequalities. By definition, the United Nations (UN Women, 2021, n.p.) defines the gender perspective as

> The process of assessing the implications for women and men of any planned action, including legislation, policies or programmes, in all areas and at all levels. It is a strategy for making women's as well as men's concerns and experiences an integral dimension of the design, implementation, monitoring and evaluation of policies and programmes in all political, economic and societal spheres so that women and men benefit equally and inequality is not perpetuated. The ultimate goal is to achieve gender equality.

Therefore, the gender perspective is essential to understand the true impact of digital media and supports on the social changes in recent decades. In addition, it cannot be ignored that digital environments -in addition to being a place where violence occurs- can be a space for raising awareness and creating spaces to eradicate violence against women. Incorporating the gender variable into the analysis and scientific knowledge of digital environments helps to explain the relationships of inequality and power established between men, women and other genders.

However, the gender perspective, although fundamental, is not always enough. In recent decades, the intersectional perspective

has been incorporated into the gender perspective (Cerqueira & Magalhães, 2019). Intersectionality is an analytical tool incorporated into the social sciences after the fourth wave of feminism (especially from black, decolonial and cultural feminisms) which warns that gender alone does not explain how various identity categories intersect (such as gender, ethnicity, class, disability, sexual orientation, religion, caste, age, nationality...) and are inserted into the respective systems of domination and discrimination (Crenshaw, 1991; Nogueira, 2011; Toupin, 2018). In this sense, Conceição Nogueira (2011) proposes the intersectional approach to gender issues as it allows one to escape from the classic gender binarism and other social structures of oppression and privilege that are not alien to gender, to analyze social reality using a range of social categories -such as gender- that, independently, fail to reflect the degree of social complexity of the realities under study.

As the historian Gerda Lerner warned in 1987: "the androcentric fallacy, elaborated in all the mental constructions of Western civilization, cannot be rectified simply by 'adding' women. To correct it, a radical restructuring of thought and analysis is necessary" (Lerner, 2017, p. 329, our translation). The critical perspective of Feminist and Gender Studies recovers the hermeneutics of suspicion to point out that any theory that downplays the demand for equality or reintroduces a mystifying discourse must be distrusted (in Spain one of the referents of this term is the philosopher Celia Amorós). Applying this critical view to the field of digital media and supports, this chapter addresses some of the issues underlying this environment in light of the apparent rationality and free will of the Internet and technological developments.

2 A TECHNOLOGICAL CHANGE WITHOUT A GENDER PERSPECTIVE

Are the technological developments of the Internet of Things perpetuating discriminatory gender biases? The multidisciplinary field of feminist studies on technoscience has shown how gender issues and other sociocultural differences of power and identity are embedded in scientific knowledge, as well as in the sociotechnical networks and practices of a globalized world.

Technology, as in scientific knowledge, "takes men and

masculinity as the norm and women and femininity as deviations" (Haslanger, 2001, p. 123, our translation), reiterating women's invisibility.

Donna Haraway's Cyborg Manifesto (1991) underscores the need to link the feminist perspective to science and technology. The cyborg emerges as a new subject, "the cyborg is a kind of personal, postmodern and collective self, disassembled and reassembled. It is the self that feminists must codify" (Haraway, 1991, p. 164), becoming aware of feminism, Haraway adverted, completely changes the map drawn by categories such as women or race, denaturing them and avoiding new universalizing concepts.

The initial disembodiment of the Internet and digital environments was a potential illusion of being able to be anything regardless of gender constructions. For Wajcman (2006), digital platforms that emerged from web 2.0 offer women new opportunities for political mobilization and the creation of information exchange networks. However, technology and its uses have ended up reproducing the same social schemes. But the consequences of the new technologies go further, since women are a minority in the professions that the women of the future are designing, most of them returning to jobs linked to care.

In this line, Remedios Zafra (2011) alludes to the patriarchal power relations inherently inserted in the differential valuation of work in digital culture and in the "occupation" of those spaces,

> Let's think "who does what on the Net", and "how they benefit from said work"; who are the prosumers who feed their digital selves on social networks (perhaps it should be said mostly: prosumers), and who are the ones who make these spaces profitable (YouTube, Facebook, Google or Tuenti, to give a few examples). Let us see that the creators of these tools coincide in this case with a unique profile of this technological age: very young boys who made their computer –and in many cases their garage- the center of a technology company. However, the value of these companies in each case is not so much the device itself, but conceiving them as "spaces" that manage to bring together millions of "I's", spaces that become a very part of affective relationships and that transform users into producers and into content.

> Undoubtedly, these relationship structures also tell us about forms of distribution of people and spaces that are not exempt from political significance. (Zafra, 2011, p. 121, our translation).

Although the Internet has become a reference for interpersonal communication, the economy, education or entertainment, it is not alien to ideological components and the logic of power. "There is nothing natural or inevitable about the practices, discourses and behaviors that arise on the Internet. To the contrary, the Internet is quintessentially unnatural; that is, it has certainly not arisen organically out of a state of nature" (Mantilla, 2015, p. 189). Judy Wajcman (2006) warns of the profound misogyny present on digital environments where pornography pages and sexual harassment, in addition to what happens on the dark web is the tip of the iceberg that shows how the status-quo and male domination of the offline world are reproduced, a digital environment built again by men and for men.

The presence of recommendation algorithms and the stratification of profiles based on their popularity or their behavior is a common practice on digital environments that generates a factory of inequalities. The logics of the market inserted on digital environments (applications, social networks, search engines, chatbots…) seek to satisfy their clients' expectations, turned into needs - which at the same time are their product - shaping the expectations of their customers, users according to a series of algorithms and metrics that socially stratify a mediated and molded intimacy.

An intersectional feminist approach to new technologies reveals the discriminatory biases of gender, race and class in data generation and use through ICTs, whose maximum exponent is social networks (D'Ignazio & Klein, 2020).

An example of sexist and racist biases present in the new media is the study by Safia Noble (2018) *Algorithms of oppression: how search engines reinforce racism*, which points out how the Google search engine perpetuates stereotyped, sexist and pornographic narratives about racialized women, and which reflect the historically unequal distribution of power in society (Noble, 2018, p. 71-83). The intersectional perspective evidences the patriarchal and racist biases in technology design and how these practices are co-constituted in

racialized and gendered forms that implies power and often uphold systemic discrimination and oppression (Toupin, 2018).

3 SYMBOLIC VIOLENCE ON DIGITAL ENVIRONMENTS

Symbolic violence is a muffled, insensitive and invisible violence for its own victims, which is exercised essentially through the purely symbolic paths of communication and knowledge or, more precisely, ignorance, recognition or, ultimately, of feeling (Bourdieu, 2000, p. 12, our translation). As Varela (2017) alludes, symbolic violence is structural, attitudes, gestures, behavior patterns, beliefs... sustain and perpetuate that domination and is present in all other forms of violence, ensuring their effectiveness:

> Not all of its manifestations have the same weight or significance; some are ephemeral, the product of a cultural machine always looking for a new approach. Taken together, however, these codes and hoaxes, whispers, threats and myths have a clear and definite goal: they try to send women back to their roles, either as daddy's daughters, or as vibrant romantics, either as an active procreator, or as a passive object of love (Varela, 2017, p. 194, our translation).

To understand the relevance of symbolic violence as a support for discrimination and violence, it is appropriate to use Johan Galtung's triangle (2003), who conceptualizes violence as a triangle (Figure 1) in which visible violence, direct violence (by example, violent acts or abuse) is only a small part of the conflict. Structural violence is related to the system and is represented by numerous situations of injustice (for example, it is observed in large cities such as Paris or Madrid with misery. While some eat and drink in abundance, others have nothing to eat). And cultural violence, which creates a legitimizing framework for violence.

Figure 1: Galtung's violence triangle

Direct violence

Visible

Invisible

Cultural violence   Structural violence

Source: by author.
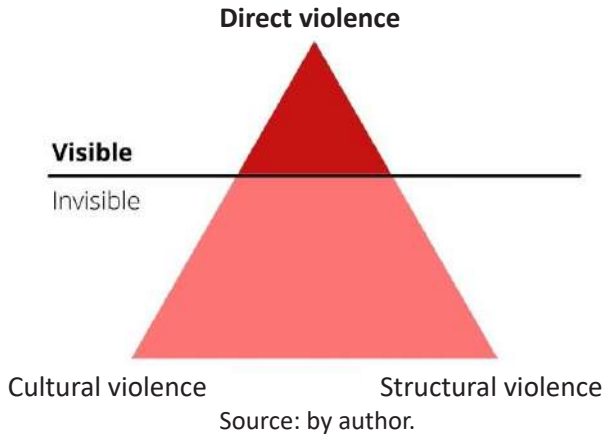
Consequently, symbolic violence on digital environments is part of the base that sustains and perpetuates all other violence (attitudes, gestures, behavior patterns, beliefs, discrimination, abuse...). The myth of beauty (Wolf, 1992), *micromachismos* (Bonino, 2016), myths of romantic love (Bosch, Ferrer, Navarro, & Ferreiro, 2011; Blanco-Ruiz, 2020), sexist language (Bengoechea, 2015), the rape culture (Tardón, 2017). They are part of that cultural and symbolic base of the violence iceberg.

This symbolic violence is learned through gender socialization, a process through which different roles and qualities are attributed based on sex (Walker & Barton, 1983, cited by Bosch & Ferrer-Pérez, 2013). In this process, which is based on the theory of the complementary natures of the sexes[1], men are assigned the role of provider/protector, they are socialized to be independent, to occupy and progress in the public

1   The theory of the complementary nature of the sexes on which all gender inequality is based was consolidated throughout the 18th and 19th centuries both in culture and in ecclesiastical doctrine and scientific thought. In the Enlightenment, thinkers such as Locke or Rousseau and scientists such as Darwin stand out, who, with their works, contributed or legitimized such theories by which women could not be considered citizens in the same way as men, because, by nature, they had different attributes which made them closer to nature. Therefore, males were born to rule and make decisions, and women, on the other hand, to procreate and take care of the family.

sphere; whereas women are attributed the role of reproducers and caretakers of the home -wives and mothers- promoting the emotional sphere and educating them so that their source of gratification and self-esteem comes from the private sphere.

The sexual division of labor is not trivial and is transferred to the symbolic universe. The differential representation of men and women in the Internet media (news, videos, banners, images, etc.) responds to stereotypes that must be analyzed and evaluated because they often constitute a source of production and reproduction of inequalities and discrimination. If we observe women who star in movies, series or advertising campaigns, we realize that the representation of women with disabilities, elderly women or African descent women, for example, is hardly existent and, when they do appear, they are usually very stereotyped. The same is true when looking at expert sources who participate in streaming programs or people who produce content on different platforms (YouTube, Instagram, Twitch, etc.).

These biased cultural imaginaries are clearly perpetuated on digital environments, and can be verified simply by searching the word "woman", "girl", "man", "boy", in the search engine of an image database. For example, if we introduce the word "family" (Figure 2), the results show in 99% a traditional family model (mother, father, son and daughter, and sometimes also the grandfather and grandmother) made up of white people.

Figure 2: Screenshot of Google search results for the term "family"
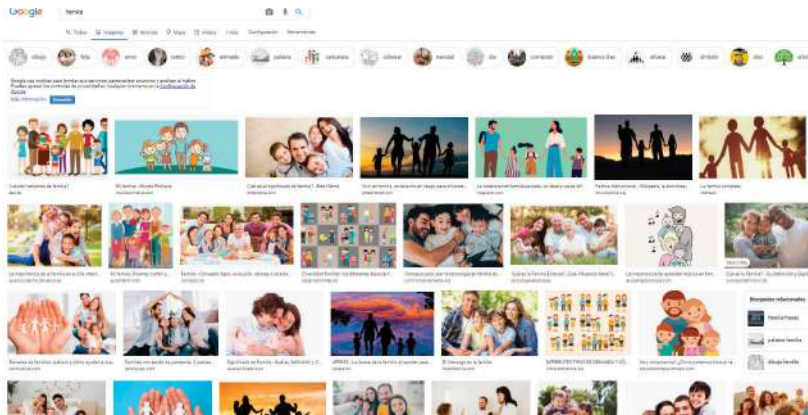
Source: Google, 2021

Digital environments based on artificial intelligence use previous cultural products to learn to be "more human". This machine learning extracts, therefore, from the predominant male view in most cultural representations (Mulvey, 1975), a view that not only has an impact on the machines, but it also has a strong impact on how women build our identity and show our self-representation on social networks.

4 DIGITAL VIOLENCE ON SOCIAL NETWORKS

Social networks are used natively, not only to consume entertainment, look for work or establish relationships with friends, but also to establish affective and/or sexual relationships. However, these virtual spaces are not neutral (Mantilla, 2015; Carrera, 2016), but instead, under the veil of horizontality and equal opportunities in terms of access to the Internet, specific violence occurs which continue to reproduce situations of inequality and subjugation from aggressors to their victims.

Gender violence is defined as any act of violence against women for the simple fact of being. This violence may result in physical, sexual or psychological harm or suffering to women, as well as threats of such acts, coercion or arbitrary deprivation of liberty, whether it occurs in public or private life. This violence is transferred to the digital

sphere, where it continues to have a structural nature and constitutes a human rights violation of over half of the population (also on digital environments).

Some of these forms of digital violence are the following:

a. Sexting, refers to sending sexual messages (erotic or pornographic) through mobile phones or computers.

b. Grooming or sexual cyberbullying, refers to the set of strategies that an adult person develops to gain the trust of the minor on the Internet with the ultimate goal of obtaining concessions of a sexual nature.

c. Cyberbullying, anglicism used to refer to the harassment and digital violence suffered by a minor who, for different reasons, is physically and/or psychologically abused by other minors through attitudes such as repression, discrimination, homophobia, violence sexual or corporal punishment. This type of violence is closely linked to bullying or gender-based violence, and has negative effects on physical health, emotional well-being and academic performance, especially if the violence is repeated over time or is severe, in addition to influencing the school setting of the educational center.

d. Stalking, Anglo-Saxon word that means stalking and describes a psychological condition known as urgent bullying syndrome. The affected person, who can be a man or a woman, obsessively persecutes the victim: he/she spies on them, follows them down the street, constantly calls them on the phone, sends gifts, sends letters and text messages, writes their name in public places and, in extreme cases, he/she even threatens them and commits violent acts against them.

e. *Pornovenganza* or porn revenge, refers to the use of photographs or videos of a sexual nature taken in a private and intimate space to publish or make them go viral without the consent of the protagonist through social networks or websites. This is a crime even when there is an agreement between the parties involved for the creation of those images or videos.

These are some of the increasingly problems in society, and in many of them the gender component is very marked (Blanco-Ruiz,

2014; de Miguel Luken, 2015; Nardi-Rodríguez, Pastor-Mira, López-Roig, & Ferrer-Pérez, 2017; Donoso-Vázquez, Rubio Hurtado & Vilà Baños, 2018; Linares, Royo Prieto, & Silvestre Cabrera, 2019, among others).

These new crimes carried out through social networks often go "unnoticed" among the youngest who consider this type of harassment as irrelevant or innocuous annoyances typical of the Network use. This gender-based cyberviolence becomes a 24-hour-day present element through the mobile or computer screen. However, cyberbullying as a form of gender violence is increasingly common, and it is a form of freedom limitation that generates domination and unequal relationships between men and women.

The digital environment has favored a romanticization of control over third parties. The WhatsApp double-check is the paradigmatic example of this control that may be subtly covering up the first stages of gender violence. The borders of intimacy and privacy have been diluted and, under the umbrella of love, a part of the digital society renounces its privacy, accepting increasingly generalized control behaviors. For example, in adolescence in Spain, 57.9% of the women surveyed do not agree at all that "When you are in love with a person you must give up your intimacy/privacy for love" while men do not. They are at 35.2% (Blanco-Ruiz, 2020).

It should not be ignored that the Internet, as Carrera (2016, p. 245) warns, "demands an active audience not due to the supposed nature of democracy of the environment, but due to the controlling nature of the environment", an idiosyncrasy that directly affects intimate life.

5 FEMINIST PROPOSALS FOR RESEARCH ON DIGITAL COMMUNICATION ENVIRONMENTS

The incorporation of gender mainstreaming (also known as mainstreaming) to digital communication environments implies a reorganization, improvement, development and assessment of all communication processes. However, incorporating women in the processes of producing or disseminating messages is not enough. The incorporation of gender perspective goes beyond the incorporation of the sex variable in the methodology, "it is no longer just about access

to research for women, but also about reforming science itself" (San Segundo, 2017, p. 1), in this case, digital communicative environments.

One measure to improve and develop the application of gender perspective in a transversal way more efficiently and fairly is to incorporate the intersectional perspective to the gender perspective (and how gender converges with issues of social class, ethnicity, race, disability, educational level, etc.). This feminist and intersectional approach should not be applied exclusively to the message, but should also reflect on the position of the sender and to whom the message is being sent (receiver).

Research on digital communication environments confirms the need to bet on communication models that incorporate the feminist perspective and are not limited to Western models (mainly Anglo-Saxon and/or European). An example of this is the magazine Comunicación y Gender, whose commitment to the feminist perspective, the digital sphere and open access, together with an internationalization model with a focus on science produced in Latin America, aims to combat gender bias and place bias of origin of the articles imposed in the production of scientific knowledge (Franco & Blanco, 2021).

On the other hand, from the perspective of the very elaboration of the message, Blanco-Ruiz and Sainz de Baranda Andújar (2019) recommend the following guidelines to be able to elaborate more inclusive and representative messages of society. According to the authors, it is important to assess the presence of people with different physical, ethnic, socioeconomic, age characteristics to represent all the people who exist in society in a real way. These people must star in roles without being attributed a supposed personality associated with gender stereotypes to build diverse reference models that propose attitudes, behaviors and values different from traditional representations. In the particular case of women, it should never be suggested that they occupy trades and professions that may be incompatible with femininity or masculinity, as they should be attributed equally. In addition, women should be shown in active positions and avoid images that show them passively (arms crossed, hands in pockets, etc.) or with an attitude of sexual availability.

Digital environments have brought a proliferation of media and supports whose emergence could have led to a change in the

gender status quo. Although at present it is not possible to speak of the Internet as an egalitarian space, the very nature of the medium allows to imagine a future in which, through the incorporation of the gender perspective and intersectionality, a more egalitarian and just digital environment can be built.

REFERENCES

Bengoechea, Mercedes. (2015). *Lengua y género*. Madrid: Síntesis.

Blanco Ruiz, María Ángeles. (2014). Implicaciones del uso de las redes sociales en el aumento de la violencia de género en adolescentes. *Comunicación y medios*, (30), 124-141.

Blanco-Ruiz, Marian. (2020). Relevancia del amor romántico en la adolescencia: una cuestión clave para el abordaje de la violencia de género. In M. D. Pozo Pérez, Á. Figueruelo Burrieza, & P. Ramos Hernández, *(Des) igualdad y violencia de género: el nudo gordiano de la sociedad globalizada* (pp.77-87). Pamplona: Aranzadi Thomson Reuters.

Blanco-Ruiz, Marian, & Sainz de Baranda Andújar, Clara. (2019). Comunicación con perspectiva de género. In *Especialista en Gestión de Políticas Públicas* (pp. 73-91). Pamplona: Aranzadi Thomson Reuters.

Bonino, Luis. (2016). *Micromachismos: el poder masculino en la pareja "moderna".* Buenos Aires: Ediciones para ELVA.

Bourdieu, Pierre. (2000). *La dominación masculina*. Barcelona: Anagrama

Bosch, Esperanza, & Ferrer, Victoria A. (2002). *La voz de las invisibles: Las víctimas de un mal amor que mata*. Universitat de València.

Bosch, Esperanza; Ferrer, Victoria A.; Navarro, Capilla, & Ferreiro, Virginia. (2011). *Profundizando en el análisis del mito del amor romántico y sus relaciones con la violencia contra las mujeres en la pareja: Análisis cualitativo.* Madrid: Instituto de la Mujer.

Carrera, Pilar. (2016). *Nosotros y los medios. Prolegómenos para una teoría de la comunicación.* Madrid: Biblioteca Nueva.

Cerqueira, Carla, & Magalhães, Sara Isabel. (2019). An Intersectional Feminist Perspective on Research: What Changes and How We Do it. In *Investigación joven con perspectiva de género IV* (pp.10-

20). Madrid, España: Universidad Carlos III de Madrid, Instituto de Estudios de Género.

Castells, Manuel. (2001). *La galaxia Internet. Reflexiones sobre Internet, empresa y sociedad*. Barcelona: Plaza & Janés.

Craig Watkins, Samuel. (2009). *The young & the digital. What the Migration to Social-Networks Sites, Games, and Anytime, Anywhere Media Means for Our Future*. Boston: Bacon Press.

Crenshaw, Kimberlé. (1991). Mapping the Margins: Intersectionality, Identity Politics, and Violence against Women of Color. *Stanford Law Review*, *43*(6), 1241-1299. doi: https://doi.org/10.2307/1229039.

De Miguel Luken, V. (2015). *Percepción de la violencia de género en la adolescencia y la juventud* (Ministerio de Sanidad, Política Social e Igualdad. Centro de Publicaciones).

D'Ignazio, Catherine, & Lauren F. Klein. (2020). *Data feminism*. Mit Press.

Donoso-Vázquez, T., Rubio Hurtado, M. J., & Vilà Baños, R. (2018). La adolescencia ante la violencia de género 2.0: concepciones, conductas y experiencias. *Educación XX1*, *0*(0). doi: https://doi.org/10.5944/educxx1.15972

Franco, Yanna, & Blanco-Ruiz, Marian. (2021). Calidad editorial y científica con perspectiva feminista: el caso de Comunicación y Género. En *Escritura académica con perspectiva de género. Propuestas desde la comunicación científica*. Universidad de Sevilla y de la Universidad Autónoma de Baja California.

Galtung, Johan. (2003). Violencia cultural. Bilbao: Gernika Gogoratuz (documento de trabajo n. 14)

Haraway, Donna. (1991). A Cyborg Manifesto: Science, Technology, and Socialist Feminism in the Late Twentieth Century. In *Simians, Cyborgs and Women: The Reinvention of Nature* (pp.149-181). New York; Routledge.

Haslanger, Sally. (2001). El feminismo en la metafísica: gestionando lo natural. In S. Haslanger, *Feminismo y filosofía. Un compendio.* Barcelona: Idea Books.

Lerner, Gerda. (2017). *La creación del patriarcado*. Pamplona : Editorial Katakrak Liburuak.

Linares Bahillo, Estíbaliz, Royo Prieto, R. & Silvestre Cabrera, María. (2019). El ciberacoso sexual y/o sexista contra las adolescentes: Nuevas versiones online de la opresión patriarcal de las sexualidades y corporalidades femeninas. *Doxa Comunicación: revista interdisciplinar de estudios de comunicación y ciencias sociales*, (28), 201-222

Mantilla, Karla. (2015). *Gendertrolling*. *How misogyny went viral.* United States: Ed.Praeger.

Mulvey, Laura. (1975). Visual pleasure and narrative cinema. *Screen, 16*(3), 6-18. doi: https://doi.org/10.1093/screen/16.3.6.

Nardi-Rodríguez, A., Pastor-Mira, M.-Á., López-Roig, S., & Ferrer-Pérez, V.-A. (2017). ¿Cuáles son las señales de alarma más representativas de la violencia de pareja contra las adolescentes? *Anales de Psicología*, *33*(2), 376-382. doi: https://doi.org/10.6018/analesps.33.2.256971

Noble, Safia. (2018). *Algorithms of Oppression: How Search Engines Reinforce Racism*. Nueva York (EE.UU.): NYU Press.

Nogueira, Conceição. (2011). *Introdução à teoria da Intersecionalidade nos Estudos de Género. En Género e Ciências Sociais*. Edições ISMAI - Centro de Publicações do Insituto Superior da Maia.

ONU Mujeres (2021). Incorporación de la perspectiva de género. https://www.unwomen.org/es/how-we-work/un-system-coordination/gender-mainstreaming

San Segundo, Rosa. (2017). Cómo se abordan los estudios de género en las universidades. Cultura universitaria y género. *Revista con la A. Los estudios feministas, de las mujeres y de género en el estado español.* (53). https://conlaa.com/como-se-abordan-los-estudios-de-genero-en-las-universidades/?output=pdf

Tardón, Bárbara. (2017). *La violencia sexual: desarrollos feministas, mitos y respuestas normativas globales.* UAM. Instituto Universitario de Estudios de la Mujer (IUEM). doi: http://hdl.handle.net/10486/680682.

Toupin, Sophie. (2018). Decolonial and Intersectional Feminist Afterthoughts, *EASST Review, 37*(4). https://easst.net/article/decolonial-and-intersectional-feminist-afterthoughts/#authors

Varela, Nuria. (2017). *Cansadas*. Madrid: Penguin Random House.

Wajcman, Judy. (2006). El tecnofeminismo. Cátedra. Universitat de Valéncia.

Wolf, Naomi. (1992). *El mito de la belleza*. Barcelona: Salamandra.

Zafra, Remedios. (2011). Un cuarto propio conectado. Feminismo y creación desde la esfera público-privada online. *Asparkía. Investigació feminista*, (22), 115-129.

CHAPTER 4

RECOVERING "FAITH IN HUMANITY": DATA, CONTENT AND INFORMATION CURATION IN CONFRONTING VIOLENCE AGAINST WOMEN - A PRELIMINARY ESSAY*

WILLIAM BARBOSA VIANNA
Universidade Federal de Santa Catarina

MARIA CRISTINA VIEIRA DE FREITAS
Universidade de Coimbra

DENISE FUKUMI TSUNODA
Universidade Federal do Paraná

ANDREA VASCONCELOS CARVALHO
Universidade Federal do Rio Grande do Norte

ABSTRACT

Violence against women is a multidimensional and interdisciplinary phenomenon. The sources for its study are dispersed, partial, incomplete, or kept in outdated databases, lacking uniformity in indexing. Corrective measures imply designing search, retrieval and sharing strategies, involving process of discovering information, for its selection and monitoring in the field. What public safety data curation strategies will be effective in facing this problem? In response, studies and initiatives are identified over a period of 15 years. The results suggest the relevance of early victim's identification and activation of preventive protocols, using artificial intelligence and machine learning, jointly with the integration, organization and coordination of data

and activities. Future studies should deepen the discussion in transparency in data opening and data governance. As a limitation, the invisibility or dispersion of scientific literature, which constrains its discovery is reported.

Keywords: violence against women, data curation, artificial intelligence, prevention measures, public security information.

RESUMEN

La violencia contra la mujer es un fenómeno multidimensional e interdisciplinar. Las fuentes para su estudio se encuentran dispersas o en bases de datos parciales, incompletas o desactualizadas y carecen de uniformidad en la indexación. Las medidas correctivas implican diseñar estrategias de búsqueda, de recuperación y de intercambio, involucrando procedimientos de localización de la información, para su selección y seguimiento en campo. ¿Qué estrategias de curación de datos de seguridad pública serán útiles para afrontar este problema? En respuesta, se identifican estudios e iniciativas en un periodo de 15 años. Los resultados demuestran la relevancia de la identificación prematura de víctimas y la activación de protocolos preventivos, empleando inteligencia artificial y aprendizaje de máquina, junto con la integración, la organización y coordinación de datos y actividades. Los estudios futuros deben profundizar el debate sobre la transparencia en la apertura y gobernanza de datos. Como limitación, la invisibilidad y dispersión temática de la literatura científica, lo que perjudica su descubrimiento.

Palabras clave: violencia contra la mujer, curación de datos, inteligencia artificial, medidas preventivas; información de seguridad pública.

Humanity is losing faith in the liberal narrative that has dominated global politics in the recent decades, precisely when the fusion of biotechnology and information technology confronts us with the greatest challenges humanity has ever faced.

Yuval Noah Harari, 2018, p. 18, our translation

INITIAL CONSIDERATIONS

Addressing the issue of violence against women is a huge challenge. It is a rhizomatic historical phenomenon[1], with multidimensional roots involving social, cultural, and political aspects, among others, which demand an appropriation of polysemic concepts and an effort towards a "slippery" theme, covered by great complexity, demanding an equally complex and interdisciplinary approach, capable of providing a critical and integral understanding of its surrounding parts.

From a historical point of view, Carneiro (2020, p. 22, our translation) recalls that "[...] there is a structure that creates, feeds and maintains violence against women as an ever-present phenomenon". This structure has its pillars based on the Patriarchy, which establishes the division between men and women, assigns behavioral characteristics and specific social roles to each gender and ranks these same characteristics and roles, establishing, as a norm, the preponderance of men over women. Consequently, in Studart's words (1983, p. 42), "[...] everywhere, women are second-class citizens".

As for the availability of reliable and necessary sources for the development of studies on the subject, we verify dispersion of data and scientific and technological information, which only broadens the gap and inhibits facing the issue. The dispersion also contributes to making the construction of solutions aimed at prevention unfeasible, both in the technical field and in the sphere of public policies, whose development is not only pertinent but also fundamental for the

---

1   In Gilles Deleuze and Felix Guattari's conception. For a deeper understanding of the subject, we recommend consulting: DELEUZE, G.; GUATTARI, F. Mille plateaux: capitalisme et schizophrénie. Paris: Editions of Minuit, 1980.

transformative and liberating advance for providing a change of the status quo.

The whole issue, which has to do with the existence of dispersed, partial, incomplete, and outdated databases, as we said, leads to an excessive differentiation of the categories used in indexing the elements constituting the core of the problem. In this sense, this dispersion and multiplicity of sources of scientific and technological information found on the subject, prevent the development of research groups to approach this theme; the situation described here is even more serious when the approaches are developed in multidisciplinary or interdisciplinary fields, precisely the case of violence against women as a research theme.

Considering the profile of the researchers interested in these research data is also necessary. In general, researchers and professors are more guided by formal channels (articles, papers, conferences, preprints, among others), while technicians, administrators and other agents of the civil society prefer informal channels; as they are faster, they appear to be more effective in solving immediate problems related to their information gaps and, for that very reason, generate sprints of action, increasing their performance.

In the academic environments, however, the problem of (non) integration of databases and information to be disseminated through formal and informal channels and intended to support decision-making remain an already "classic" problem. It is assumed in an interdisciplinary way and becomes critical, especially when interest turns to the search for bibliographic references, aiming at selecting them and composing literature reviews that may be at the origin of scientific works of varying magnitude, presented in prestigious vehicles for scientific dissemination and targeted at a specialized public interested in updating their knowledge.

On top of this problem is the fact that new and more complex scientific databases and information sources of different nature are published all the time and in real time, which, on the one hand address the topic, but on the other, they are not necessarily indexed and may be made available in places other than those normally used or within the reach of scholars. Hence the invisibility of this produced knowledge.

Along with the scientific literature, products, materials, processes, and good practices that may be relevant to the subject are produced, but due to the lack of monitoring, they can contribute to the unwanted failure of researchers, funders, public agents, and social organizations of civil society in tackling the issue.

The challenge posed to the integration of databases and information implies the design of search, retrieval and sharing strategies, and involves the use of a set of procedures and technological mechanisms capable of locating information and enabling its selection and monitoring so that the evolution of the theme and the interaction across researchers in the field of investigation can be followed.

Another posed challenge concerns the need to provide long-term management of selected data and information due to its usefulness and potential in promoting interaction between groups of researchers focused on the subjects in question.

In a scenario such as the one outlined above, the following questions immediately arise: what would be the definitions and contours wrapped in the aura of the theme violence against women? How to support the selection and monitor the development, updating and sharing of data and information in the field of violence against women? What strategies or potentialities are envisaged in the scope of data and/or information curation, and in what way could they be useful or effective in the study and deepening of this theme? What role do data, content and information about women play in the development of digital curation on the topic of public safety? Given its relevance and evident complexity and centrality, answering these questions, even if in a preliminary way, becomes the specific objective of this text.

As constituent parts of the problem and in the role of researchers who are active and deeply concerned with – and impacted by – these questions, we intend to see them answered, even if in a preliminary way. The conceptual framework thus begins with the identification of national studies and initiatives and extends to some international approaches. The selected texts are consistent with the last 15 years, with some exceptions for the use of older texts, admitting their relevance to the present topics. The main objective is to systematize some knowledge and shed light on the subject, with a view to their better understanding and study.

1 BASIC CATEGORICAL ELEMENTS ON DOMESTIC AND FAMILY VIOLENCE AGAINST WOMEN

Initially, it is worth highlighting the difference between sex and gender. This is provided by Harari (2020). For the author, conventionally, the first term ("sex") is a biological category, which refers to a set of objective and constant characteristics over time, which differentiate female human beings from male human beings. The second term ("gender"), the author continues (Harari, 2020), refers to a cultural category, constructed intersubjectively, marked by geographical, historical, political, religious, and social particularities and by transformations undergone in its conception over time. Thus, based on gender as a specific difference, a distinction is established between human beings, mainly as men or women, with the possibility of including other categories. According to the different conceptions pointed out by Harari (2020), Table 1 illustrates the distinctive categories of the female sex and the gender woman, considering their constancy or transformation over time.

Table 1: Differences in conceptions between sex (female) and gender (woman)

Female sex individual = Biological category		Woman = cultural category	
Classical Athens	**Modern Athens**	**Classical Athens**	**Modern Athens**
XX Chromosomes	XX Chromosomes	Cannot vote	Can vote
Uterus	Uterus	Cannot be a judge	Can be a judge
Ovary	Ovary	Cannot have a public job	Can have a public job
Low testosterone	Low testosterone	Cannot choose a partner to marry	Can choose a partner to marry

Female sex individual = Biological category		Woman = cultural category	
Classical Athens	**Modern Athens**	**Classical Athens**	**Modern Athens**
High estrogen	High estrogen	Typically illiterate	Typically literate
Can produce milk	Can produce milk	Is legally owned by father or husband	Is legally independent
Exactly the same		Completely different	

Source: Harari (2020, p. 206, our translation).

Thus, the hierarchy and asymmetry of powers and possibilities between genders advocated by the Patriarchate (Carneiro, 2020, p. 22), which establishes the division between the sexes and assigns behavioral characteristics and specific social roles, is grounded on the bases from which unequal relationships between men and women develop, thus contributing to creating, perpetuating, updating, and justifying the different forms of violence exercised against women in families and in society.

As explained by Harari (2020, p. 207, our translation), "[...] at least since the Agricultural Revolution, most human societies have been patriarchal societies that value men more than women". Since then, and until now, this has been a stable and universal social norm based "[...] on unfounded myths and not on biological facts" (Harari, 2020, p. 219, our translation).

As Carneiro (2020) recalls, this ideological apparatus, which comes from the patriarchal structure and which places women in a situation of vulnerability, is maintained and guaranteed by culture, traditions, and the legal and institutional apparatus. In this context, violence emerges as a way of exercising power – of men – over women.

Unlike other groups, targets of violence, it is noteworthy that violence against women occurs mainly in domestic and family contexts and in intimate relationships of affection, which means that between the woman in a situation of violence and her aggressor (here personified in man) there are ties of kinship and affection, which grants greater

complexity to the problem and greater challenges to be tackled.

According to Walker (1979 apud Conselho Federal de Psicologia (CFP) [Brazil], 2013, p. 106), domestic violence is cyclical and occurs in three successive phases: tension, explosion, and honeymoon. For the CFP (2013), one of the reasons that reinforce the maintenance of this cycle of violent relationship is the promises of change made by the aggressor (in this case, the man) and the desire for this change to actually occur, expressed by the woman. These phases can have different durations and intensities, depending on the case, and the time it takes for each woman to realize the seriousness and the physical, psychological, and emotional damages of this violent relationship is also very variable, and can take months, years or never occur. From this perspective and considering that each situation has contours and is of unique complexity, a rigid model is impossible to be fitted, therefore, the CFP adapted the cycle of violence proposed by Walker, in 1979, and added a fourth stage – "Repent and promise of change" – as shown below (Figure 1).

Figure 1: The vicious circle of domestic violence against women

Source: adapted from CFP (2013, p. 106, our translation).

In the Brazilian legal framework, Art. 5 of Maria da Penha Law, Law nº 11.340/2006 (Brasil, 2006, our translation) defines that "[...] domestic and family violence against women is any action or omission based on gender". From this definition, Marques (2020, p. 39, our translation) clarifies that "[...] any action or omission that causes harm to someone" is violence, whether physical -, this one the most recognized form -, sexual, patrimonial, or symbolic. These various types (or nuances) of violence against women are manifested in different contexts in which they are inserted, such as: work, educational, religious, or public; although they are considered particularly (potentially) more dangerous, for reasons that are generally known, all those cases that occur in the domestic and family environment.

Another important aspect to consider in the debate on violence against women is that the risk of violence can be higher or lower, depending on the racial, socioeconomic, educational, and sexual orientation characteristics of these women. Women with more than

one of these characteristics are more vulnerable or exposed and are at greater risk of suffering this type of violence than others.

And in this framework, we find some of the arguments that justify the need to analyze and understand violence against women from the established intersectionality, that is, from a crossing of intervening factors or variables. The studies carried out today based on this intersectionality have their origin in others, which relate gender, race, and class. According to Gomes (2020, p. 84, our translation), intersectionality is a term used to explain "how the power relations that structure society intersect and directly affect the lives of certain groups, placing them at a specific disadvantageous position". From the perspective of this approach, concerning the Brazilian reality, it is understandable why, for example, black women, lesbian women, and poor women are especially considered as targets of violence, which intensifies when this woman is black, lesbian, and poor (coexistence of factors).

Naturally, the term domestic and family violence has a wider range than violence against women, referring to violent acts between people who have affective ties with each other, whether they are related - or not - and who share the same place - or not. Thus, within the framework of domestic and family violence, different groups can be found, such as: children, adolescents, adults, or elderly people, of both sexes.

However, violence against women is highlighted here, not only because it is the focus of this study, but also because it occupies a central place in the experience of this phenomenon, which is understood by the centrality women play in families, which is largely due to the historical, social, and culturally constructed role of caregiver and main responsible for the well-being of the members of the family nucleus. Furthermore, as Marques (2020, p. 43, our translation) states, "when a woman suffers violence, the whole family suffers". In this sense, reflecting on domestic and family violence is, above all, and in the first place, reflecting on violence performed against women.

Thus, and as stated by Veloso (2020, p. 169, our translation), the act of "[...] transforming domestic and family violence into a public issue is part of the historical struggle of women". In this sense, disclosing issues traditionally considered restricted to the private

sphere to the public scene implies showing that domestic and family violence are social problems and that, therefore, society and the State need to recognize and face them in an open and transparent way. This becomes especially relevant as Harari states,

> [...] over the last century, social gender roles have undergone an enormous revolution. Today, societies not only grant men and women equal legal status, political rights, and economic opportunities, but also completely rethink their most elementary conceptions of gender and sexuality. While gender differences are still significant, things are moving fast. (Harari, 2020, p. 218, our translation).

The advances achieved in the scope of gender conceptions and in the confrontation of domestic and family violence, as we said earlier, are historically and socially constructed. For example, regarding the contribution of education to the transformation of society, Pontes (2020, p. 68, our translation) highlights "[...] the importance and responsibility of a dialogical and liberating education so that, in fact, this transformation occurs based on critical sense". Although education is built within the family and other spaces of social interaction, the school is the institution formally constituted for this purpose. Therefore, this space needs to be committed to critical reflection and to changing minds, which includes building a clear perspective on facing the problem. Therefore, as Pontes says, it is up to the school to exercise a

> [...] direct and permanent action with students and their families to build narratives and actions in favor of social justice and forms of prevention and opposition to domestic and family violence against women, adults, adolescents, or children. (Pontes, 2020, p. 68, our translation).

However, the author recognizes that as the school and its agents are immersed in the values spread by the patriarchal society, in which the empowerment of men to the detriment of women is considered "natural" (or intentional), "the current educational model [...], has to do with a colonizing, patriarchal and drilling project, which teaches about obedience and restriction of the body, increasingly distant from

the emancipatory perspective, especially for women" (Pontes, 2020, p. 78, our translation).

Therefore, it is necessary to constantly reinforce "the role of the school as a space for reflection and transformation of society, strengthening the struggle against sexism and patriarchy manifested in violence against women" (Pontes, 2020, p. 78, our translation). Consequently,

> [...] it is through education that the viewpoint of the people involved in the cycle of violence can be broadened in terms of rights, gender, justice, and citizenship. And the school, as the primary locus of knowledge construction, must contribute to the narrative dispute and deconstruction of this naturalization of immutable genres, towards a social reconstruction of gender roles. (Pontes, 2020, p. 70, our translation).

In this context, the role played by the media in the perpetuation or confrontation of domestic and family violence against women is noteworthy. As indicated by Thompson (1998 apud Veloso, 2020, p. 169, our translation) "[...] far from being a mirror of reality, the media acts as an agent in the construction of representations about the world and influences social practices". In this sense, the media and network communication also play a significant role, both in the visibility of the phenomenon of domestic and family violence against women and in the construction of a critical narrative of the phenomenon, questioning socially constructed prejudices and offering a vision that contributes to a more just and egalitarian culture and that provides freedom and respect for all.

In the current scenario, based on the intensive use of social media, on the constant and diversified production of digital content and on the continuous action of prosumers[2], society experiences the challenges of excess or information overload which, among other things,

---

2   Term coined by Alvin Tofler, in 1980, in the well-known work "The third wave". For a critical appreciation of the term and a more current reading of it, see: LANG, B.; DOLAN, R.; KEMPER,J.; NORTHEY, G. Prosumers in times of crisis: definition, archetypes and implications. **Journal of Service Management**, *[s. l.],* v. 32*,* n. 2, p. 176-189, 2020*.* DOI: 10.1108/JOSM-05-2020-0155.

prevents the implementation of the process of identifying sources of quality information. As Carvalho (2020, p. 179, our translation) says "the great challenge in working with information is, more than ever, to select the right information, in suitable time and format for a specific information need". Thus, content curation, especially the one applied within the scope of Social Communication and Education, but not exclusively, can contribute to a critical reflection on the phenomenon of domestic and family violence against women, revealing itself as a promising tool in facing this same problem.

2 THE POTENTIALS OF DIGITAL AND CONTENT CURATION FOR CONFRONTING DOMESTIC AND FAMILY VIOLENCE AGAINST WOMEN

Confronting the problem of domestic and family violence against women is situation in which adequate information offered at the right time so that it can make a difference is increasingly understood as the role and importance of content curation. Evidently, this entire process of searching, selecting, editing, and adding value and quality to the content, especially on digital environments, followed by its sharing, use and reuse, generates direct and indirect benefits for people and society[3].

In the work *The Fourth Paradigm: Data-Intensive Scientific Discovery*, edited by Hey, Tansley and Tolle (2009)[4], the four paradigms were approached from the perspective of its author, Jim Gray, and his considerations on the subject (figure 2).

---

3   For an in-depth look at the subject, consult: YILDIRIM, I. E.; & ERGÜT, Ö. Research on the subject of "violence against women": a bibliometric analysis since 2000. **Marmara University Journal of Economic & Administrative Sciences**, [s. l.], v. 38, no. 2, p. 311–333, 2016. Available at: https://doi.org/10.14780/muiibd.281417. Access on: 3 Sept. 2021.

4   This work is dedicated to Jim Gray, who coined the term.

Figure 2 - Science paradigms, from Jim Gray's perspective.
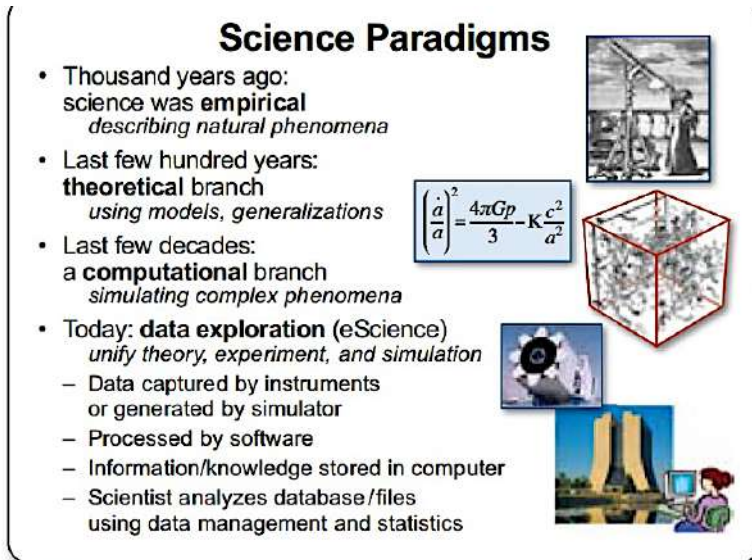
Source: Hey, Tansley and Tolle (2009, p. xviii).

In Jim Gray's perspective (2007), cited by Hey, Tansley and Tolle (2009, p. xviii), the four paradigms would be: "empirical branch", "theoretical branch", "computational branch" and "data exploration (eScience)". As seen in figure 2, the four research models proposed at that time are historically marked and outline an evolutionary line. And the focus in current studies, on the so-called "fourth paradigm" – eScience or data science – leads us to reflect on its roots and the place it has been occupying in society.

A little further on, Mayer-Schonbeerger and Cukier (2013) highlighted the role of information and communication technologies in the way science was being done. In their view, among the technological challenges to be faced, in the near future, it would be the need to improve the capture, analysis, modelling, visualization and preservation of scientific information, formal sources of knowledge construction, which would highlight the systems computational tools and their centrality in research processes.

Add the fact that the informal sources can (and should) be

aggregated to generate knowledge which are particularly important in the context of domestic and family violence against women.

In this sense, and as highlighted by Beagrie (2004), a decade and a half ago, digital curation would be increasingly used in actions with a strong potential to add value and make digital information resources available for as long as they were required, as one of its principles.

In the current context, it really appears, although not in a generalized way, as a strategy used to carry out a good data and digital objects management identified as relevant in the access to updated and reliable information on a given subject, comprising the entire data or object life cycle and with a view to their accessibility, in this case, monitoring and preservation are considered inherent aspects of the process.

Beagrie (2004) also mentioned that digital content management, with the consequent preservation, would imply increasingly important processes in the education and research agenda. A large part of knowledge bases and intellectual assets of institutions and collaborators were already (and still are) available on digital environments. Unless significant efforts are made towards digital preservation, ensuring long-term access to these digital resources, uncertainties about archiving would continue (Beagrie, 2004) to prevent the growth and adoption of new services and new work practices. Consequently, the investment to be made in the content digitization would probably not be enough to guarantee anything more than just short- or medium-term benefits, not appropriate to the identified needs[5].

For Higgins (2011), comparatively, in the past, preservation implied, on the one hand, safeguarding access to a relatively small core of face-to-face users and, on the other hand, maintaining document integrity and authenticity. Currently, there is a shift in focus, mirrored in the need to ensure that digital resources are managed throughout their entire life cycle, ensuring their accessibility over time so that they are available for use to whoever needs them.

In addition, the scientific literature on Digital Curation in Brazil has several contributions regarding its theoretical aspects. However,

---

5   In the United Kingdom, a workshop held in 1995 by the University of Warwick also explored several strategic issues related to digital preservation, including methods, policies, and practices.

given the pragmatic aspects and the diversity of information sources associated with the complex problem of violence against women, it appears that the traditional use of digital curation (that is, in a scientific and technological sense) is clearly insufficient to cope with the prevention of a phenomenon that involves several agents and informal sources not found in libraries and public archives, such as, for example, those that come from social networks, oral sources, police and public safety information.

Acknowledging the origin of the data to be curated brings the discussion of its production. In the context of the already widely known FAIR Principles (Findable, Accessible, Interoperable, Reusable), it will be necessary to ensure that the ties linking the data to the entities that produce them (people, laboratories, companies, etc.) are not lost over time or a crucial component for their future interpretations will be lost. Thus, the schemas and data plans must include guarantees that clearly go in this direction.

A few years ago, when discussing the contribution that Archival Science could offer to the emerging area of Data Science, more specifically in the context of archiving research data, Fear and Donaldson (2012, p. 320), citing the studies by Vardigan and Whiteman (2007), considered that the principle of provenance, well known in the archival environment, was repeatedly mentioned as descriptive information that should appear in Archival Information Packages (AIP) and be incorporated into the data record metadata to account for its provenance and ensure its accessibility and interpretation in the future, functioning as an added value to the archived data ''by providing enhanced resource discovery and richer comprehension about the data and its provenance'' (Corti, 2007, p. 48 apud Fear; Donaldson, 2012, p. 320). This "enhancement" of the data through information about its provenance was considered a critical factor for improving visibility and facilitating its effective use by researchers and teachers. Fear and Donaldson (2012) identified, as a research gap to be filled in future studies, the need to increase the perception around how information end users interacted with all this information related to the origin of the data they received, claiming that there was little evidence on how they actually used such sources.

It is not difficult to understand the relevance of these issues

related to the origin of the data (one of the requirements associated with the FAIR Principles), in the context of subjects with such a sensitive character and with such evident social relevance in the present, and probably in the future, as the case of violence against women. Increasing the guarantees data can be used by whomever need them is a contemporary imperative and an endorsement to avoid erasing or fading that memory in the future.

From another line of reasoning, mastery and experience in using tools or methods associated with the selection and automated analysis of data appear to be useful. The field of data analysis, whether through data mining or statistical analysis, has received special attention such is the volume and variety of accumulated data, it is difficult to express in quantitative values accumulated in the most diverse areas of knowledge. It is now possible to compare research methods and techniques applied to the discovery of knowledge in databases in different domains (medicine, music, security, law, veterinary and others). The tasks (grouping, classification, and association) and steps (cleansing, selection, transformation, mining, and appraisal) of the knowledge discovery process in databases (Knowledge Discovery in Databases [KDD]) have been widely studied.

Solutions and/or tools can also be assessed and compared depending on their domains. Among these, due to their potential for use or popularity, the following stand out: the Waikato Environment for Knowledge Analysis (WEKA) tool, developed at the University of Waikato (New Zealand). This tool implements a package of quite interesting data mining algorithms for database integration. Other platforms with interest for extracting large volumes of data are Pentaho, Rapidminer and KNIME[6]; and within the scope of standard programming languages, Python and R. Among the various data analysis tools with great potential for use, R Studio and SPSS stand out in statistical analyses. The Atlas.Ti tool, in turn, is an excellent resource if the option falls on the treatment of qualitative data. All this range of tools can bring interesting and fundamental results for the development of a digital curation applied to the problem of confronting violence against women.

---

6   The KNIME Analytics platform was proposed in 2004 and launched in 2006 by a team of software engineers from the University of Konstanz. It is an open-source software that includes data wrangling and machine learning techniques based on visual programming.

However, it is worth recalling that information curation can be developed through the analysis of a human specialist who, aided by these tools or computer systems, will be able to extract and interpret information and thus provide a significant and relevant value to a determined audience (Languens García, 2013). The process of adding value naturally appears to be eminently human. In this way, information curation is an activity that must be based on the skills and abilities of information professionals.

However, as it is a relatively new process in several sectors on which national scientific production is scarce, it is still little explored in terms of training professionals in the area at undergraduate and graduate levels. Research around these subjects can also contribute to increasing this knowledge. Consequently, it may have repercussions on improving the skills and competences required to cope with these vital and emerging processes.

3 DATA, CONTENT AND INFORMATION ABOUT WOMEN AND THEIR CENTRAL ROLE IN THE DEVELOPMENT OF DIGITAL CURATION ASSOCIATED WITH THE THEME OF

PUBLIC SAFETY

The data and information collection and processing on violence against women within curation processes may be able to generate the expected capillarity in prevention systems (Federici, 2019). In this way, critical inputs can be collected with relevant outputs in the construction of outcomes, which extends to the theme of public safety due to the evident relationship with the present topic.

The latest data disclosed by the Gender Equality Observatory for Latin America and the Caribbean (OIG, 2021)[7], an institution linked to the United Nations (UN) and responsible for recording and monitoring statistics associated with these types of crimes, visualized by country, when added together, reveal an absolute number of 4684 women victims of femicide, in the 21 countries of the region (Latin America and the Caribbean). As well known, in these geographic areas, the rate of this type of crime is twice as higher as in other regions of the world.

---

7   Available at: https://oig.cepal.org/pt/indicadores/feminicide- or-feminicidio. Access on: 7 Sep. 2021.

Moreover, according to data published in the United Nations Children's Fund (Unicef, 2017) report entitled "A familiar face: violence in the lives of children and adolescents"[8], there is a perverse record of almost 300 million children between two and four years old, all over the world, who are victims of "[...] some kind of violent discipline by their caregivers; 250 million (about six in ten) are punished with physical punishment" (Unicef, 2017, p. 2). These data add to others, present in the same document (Unicef, 2017, p. 2), which give due account that, worldwide, about 130 million students are bullied and that approximately 15 million adolescent girls (between 15 and 19 years) have already been subjected to the experience of sex without consent at some point in their lives. Of these, as the same report complements, about 9 million had already been victims in the past (UNICEF, 2017, p. 4). Add to that the record of an increase in the number of ill-treatment suffered by elderly people within their own families.

As a response to these inhuman statistics, the United Nations 2030 Agenda for Sustainable Development explicitly declares that there can be no sustainable development without gender equality and that, to tread this path, it is essential to address ways to prevent violence, abuse, and harassment in the domestic sphere, strongly aggravated during the restrictions posed by Covid-19, all over the world[9].

8   Available at: https://prceu.usp.br/wp-content/uploads/2021/04/violencia_na_vida_de_criancas_e_adolescentes_unicef2017_resumo_port.pdf. Access on: 7 Sep. 2021.
9   According to the head of the National Secretariat for Policies for Women (SNPM), Cristiane Britto, there was an increase in cases in several countries, but the data, even earlier, already represented a pandemic in the sense of violence against women. One in three women has suffered or will suffer some form of physical or sexual violence. Most homicides committed by a partner or relative are against women (2 out of 3), 38% of the woman murders are committed by a male partner (BRASIL, 2020).

In Brazil, many cases of violence against women are not even reported[10]. However, it is believed that they could be avoided or mitigated by implementing effective data and information curation processes and integration across platforms. However, while the problem of information dispersion on databases generated by various entities, public or private, mainstream sources or social networks persists, little will be done preventively, which often appears to be the only dimension on the which action can be taken, especially in extreme cases. Add unpreparedness to deal with these situations to the problematic and we are really in debt with the victims who suffer the consequences of these acts daily[11].

Some isolated technological initiatives can be identified as responses to confronting violence against women. Due to their relevance, we will discuss them.

The first initiative to mention is the *Call 180* - Women's Assistance Center[12], available by the Ministry of Women, Family and Human Rights. This service can be activated through a toll-free call, made through the Human Rights Brazil application[13] or through the National Human Rights Ombuds website[14].

Some initiatives in the computational field such as the Electronic Police Station of the Civil Police of the Federal District allows the online report of incidents, and the Electronic Judicial Process (PJE), a digital platform aimed at monitoring the electronic lawsuits procedures.

---

10   The various forms of violence against black women aged between 15 and 29 years, mostly range from symbolic, financial to physical violence, the latter involving beatings, firearms, pocketknives, sledgehammers, scissors, strangulations, hammers, sickles, iron bars, forks, screwdrivers, knives, among other objects (TATSCH, 2019).

11   For an analysis of the phenomenon, we suggest: SAGRILLO SCARPATI, A.; KOLLER, S. H. Atendimento a vítimas de violência sexual: revisão da literatura acerca do treinamento de policiais. **Psico**, *[s. l.],* v. 51, v. 1, p. 1-13, 2020. Available at: https://doi.org/10.15448/1980-8623.2020.1.32435. Access on: 3 Sept. 2021.

12   Available at: http://www.gov.br/mdh/pt-br/navegue-por-temas/politicas-para-mulheres/ligue-180. Access on: 3 Sept. 2021.

13   Available at: https://www.gov.br/pt-br/apps/@@galeria-de-aplications. Access on: 3 Sept. 2021.

14   Available at: https://www.gov.br/mdh/pt-br/ondh/. Access on: 3 Sept. 2021.

Solutions using technologies linked to artificial intelligence working from applications and conversational robots offer services and information that help in reporting and identifying situations of abuse and violence. We can mention as examples: i) the application PenhaS[15], developed by Revista AzMina; and ii) the robot MAIA (Minha Amiga Inteligência Artificial)[16], developed by Microsoft and the São Paulo State Prosecution Service.

Unfortunately, these applications and/or technologies may not be as useful in all cases. Many of these victims – women – do not have access to cell phones, the internet or are simply unaware of how these digital tools are used, or in some situations the use may become unfeasible to warrant their safety. As we know, all this lack of resources or this vulnerable situation of digital illiteracy cannot be resolved overnight. However, it must be, in parallel and rigorously, faced.

Some international initiatives can also be highlighted. In this context, IEEE Innovation[17], for example, presents preventive tools using a combination of Artificial Intelligence (AI) and Machine Learning (ML), at the service of trained experts in human security to verify e-mails, texts, documents and track social media activity. These private, student-oriented technology companies are looking for warning signs posted on social media. The objective is to monitor indicators of cyberbullying, sexism, drug and alcohol use, depression, and other identifiers of risk of violence, not only for the people responsible for these messages,

15   The PenhaS application grants access to any woman as long as they register on the platform, where personal data will be required, such as full name, date of birth, contact telephone number, e-mail and Individual Taxpayer Identification Number (CPF). After filling in the data, the platform directs them to a safe environment, in which registered women will be informed on how to act in cases of abuse, harassment and other types of violence. The aim is to give proper support to those experiencing these situations. Available at: https://azmina.com.br/projetos/penhas/. Access on: 3 Sept. 2021.

16   The MAIA robot is available to provide information on "how and when to act to impose limits" in relationships, interacting as a friend of the user. There is no need to register to dialogue with MAIA and, also, it is not necessary for the woman to be going through a risk situation to start a conversation with the robot. It is therefore a prevention tool aimed at teenagers and young women, aged between 15 and 24, with an appealing language that inspires confidence. Available at: http://www.104 mpsp.mp.br/namorolegal/. Access on: 3 Sept. 2021.

17   Available at: https://innovationetwork.ieee.org/can-artificial-intelligence-prevent-school-violence/. Access on: 3 Sept. 2021.

but for others, who may be their potential victims. Thus, any signs discovered by the tools trigger different levels of alert, which are brought to the attention of agents with intervention power (school administration, parents, and law enforcement officers), depending on the severity of the situation[18].

4 FINAL CONSIDERATIONS

Contributing to guarantee equity and social justice will be one of the great challenges to be taken on in the development of technologies (smart technologies) based on the use of algorithms (AI) capable of influencing decision-making in public life and in enhancing good social welfare, public safety, and urban planning.

In these data-based decision-making processes, some social groups may be excluded, either because they do not have access to the necessary devices, or because the selected data sets are simply not capable of considering the needs, preferences, and interests of marginalized or disadvantaged people (Furber *et al.*, 2018).

However, paths that can be tracked by digital curation have already been tracked, focusing on the theme of violence against women. In the public or private sphere, the search for integrated and preventive solutions, based on structured databases and the support of artificial intelligence and machine learning highlight geolocation, the recording of violent behavior, the identification of risk factors, on-line reports and authentication with legal validity for public safety bodies that are part of the National Public Safety System (SINESP), among other initiatives.

In an environment where life and death play a dangerous game, solutions that permit, for example, to identify potential victims of violence, in families and communities, and activate preventive action protocols corresponding to their vulnerability levels or solutions that are activated online, anonymously, to aid and care for victims based

18   Bark Technologies reported, for example, that by running a test pilot of its program with 25 schools in 2017, it encountered alarming situations, including the threat of bombing and school shooting. The interview, published in the digital press, is available at: https://eu.usatoday.com/story/tech/2019/02/13/preventing-next-parkland-artificial-intelligence-may-help/2801369002/. Access on: 3 Sept. 2021.

on crossing data and information are welcome. Although some of its strategies are relatively recent, both artificial intelligence and machine learning can have a strategic role and an increased presence when applied to these types of cases and populations.

In this sense, it is urgent to investigate and develop digital solutions supported by data and information integration to promote the articulation, organization and coordination of activities and reach favorable levels of effectiveness concerning the prevention of violence in families and communities, in general, but with a focus on violence against women, the target of this text. As stated above, it is an urgent and strategic issue in the field of Information Science.

Far from intending to exhaust the topic, which remains entirely open on the current agenda, we highlight the importance, for further studies, of deepening these aspects, combining them with others of the same content, which were not explored in this text, as they escape its scope, such as: transparency in opening data and information and its relationship with governance, as challenges in facing the problem of violence specifically directed against women.

As a limitation, the aforementioned difficulty related to the assumption of invisibility or thematic dispersion of, probably, much of the scientific literature that we believe cover the subject, but which is diluted in bases of referential data and indexed differently, which hinders its discovery. Also, attention is paid to the fact that the results of this study are anchored in the activity of an ongoing Research Group and that, as such, are preliminary and not conclusive.

As a corollary, the increasingly present certainty that the future data will be as good as our abilities are in the present to mobilize society and science to identify and select them and to choose the most appropriate strategies to preserve and make them accessible so that they are continually used and reused.

REFERENCES

Beagrie, N. (2004). The continuing access and digital preservation strategy for the UK Joint Information Systems Committee (JISC). *D-Lib Magazine, 10*(7/8).

Brasil. (2006) *Lei nº 11.340 de 7 de agosto de 2006*. Cria mecanismos para coibir a violência doméstica e familiar contra a mulher, nos termos do § 8º do art. 226 da Constituição Federal, da Convenção sobre a Eliminação de Todas as Formas de Discriminação contra as Mulheres e da Convenção Interamericana para Prevenir, Punir e Erradicar a Violência contra a Mulher; dispõe sobre a criação dos Juizados de Violência Doméstica e Familiar contra a Mulher; altera o Código de Processo Penal, o Código Penal e a Lei de Execução Penal; e dá outras providências. Brasília: Presidência da República.

Brasil. Ministério da Mulher, da Família e dos Direitos Humanos. (2020). *Webinário internacional busca soluções digitais no enfrentamento à violência doméstica em tempos de pandemia.* Ministério da Mulher, da Família e dos Direitos Humanos.

Carneiro, I. (2020). *O processo de debates e a construção de direitos* (vol 2)*.* Fundação Demócrito Rocha: Universidade Aberta do Nordeste.

Carvalho, A. V. (2020). Curadoria de conteúdo: entre os desafios e as perspectivas da gestão da informação atual. In A. V. Carvalho, & P. A. Barbosa Neto. *Desafios e perspectivas em gestão da informação e do conhecimento* (pp. 175-223). Natal: EDUFRN.

Conselho Federal de Psicologia (CFP) Brasil. (2013). *Documento de referência para atuação de psicólogas (os) em serviços de atenção à mulher em situação de violência.* 2013.

Fear, K., & Donaldson, D. (2012). Provenance and credibility in scientific data repositories. *Archival Science*, *12*(3), 319-339. doi: /10.1007/s10502-012-9172-7.

Federici, S. (2019). O feminismo e a política dos comuns. En H. B. Holanda (Ed.). *Pensamento feminista: conceitos fundamentais.* Rio de Janeiro: Bazar do Tempo.

Fundo das nações unidas para a infância (UNICEF). (2017). *Um rosto familiar: a violência na vida de crianças e adolescentes* (relatório)*.* Nova Iorque: UNICEF.

Furber, S., King, R., Brassington, I., Scaife, A., Coyle, D., Ribeiro, B., Dundon, T., Diver, C., Castela, V., Cangelosi, A., Lennox, B., Grieve, B., Peek, N., O'Neill, J., Brown, G., Roper, K., Whittal, C., Peters, C., & Waddington, A. (2018). *On AI and robotics*. https://

policyatmanchester.shorthandstories.com/on_ai_and_robotics/
index.html

Gomes, P. O. (2020). *Gênero e interseccionalidades* (Vol. 6)*.* Fundação Demócrito Rocha, Universidade Aberta do Nordeste.

Harari, Y. N. (2020). *Sapiens: uma breve história da humanidade*. Porto Alegre: L&M Pocket.

Hey, T., Tansley, S., & Tolle, K. (Eds.). (2009). *The fourth paradigm: data-intensive discovery*. Redmond: Microsoft Research.

Higgins, S. (2011). Digital curation: the emergence of a new discipline. *International Journal of Digital Curation, 6*(2), 78-88.

Languens García, J. (2013). *Proceso de curación de contenidos: curso de content curation*. 2013. [Documento não publicado].

Marques, R. (2020). *Feminicídio no Brasil* (Vol. 3)*.* Fundação Demócrito Rocha: Universidade Aberta do Nordeste.

Mayer-Schonberger, V., & Cukier, K. (2013). *Big data: como extrair volume, variedade, velocidade e valor da avalanche de informação cotidiana*. Elsevier.

Pontes, E. S. (2020). *A educação no enfrentamento da violência doméstica e familiar* (Vol. 5)*.* Fundação Demócrito Rocha, Universidade Aberta do Nordeste.

Studart, H. (1983). *Mulher: objeto de cama e mesa*. Vozes.

Tatsch, C. (2019, noviembre 25). Mais de 12 milhão de mulheres sofreram violência no Brasil entre 2010 e 2017. *O Globo*.

Veloso, R. (2020). *Mídia e violência doméstica* (Vol. 11)*.* Fundação Demócrito Rocha; Universidade Aberta do Nordeste.

C H A P T E R 5

DIGITAL CURATION IN COLLECTIONS AND DIGITAL ENVIRONMENTS OF WOMEN'S MUSEUMS

STEPHANIE CERQUEIRA SILVA
Universidade Estadual Paulista

MARIA JOSÉ VICENTINI JORENTE
Universidade Estadual Paulista

ABSTRACT

The collections of women's museums present themes that enhance the possibilities of creating a female protagonism in various social practices. In this context, we seek to understand how the convergence between Digital Curation and Information Science contributes to the construction of collections on digital environments from information organization, presentation, and representation, aimed at access and sharing. The general objective is to contextualize the concepts and definitions of such areas to identify effective articulations for the construction of digital collections for women's museums. The results demonstrated the need for a reflection on the methodology designed for continuous improvements in information access and sharing. The implementation of Digital Curation strategies and actions for the construction of collections in digital environments is believed to expand the objectives of women's museums.

Keywords: Information Science, Digital Curation, digital environments, women's museums.

RESUMEN

Los acervos de los museos de lo femenino presentan temáticas que amplían las posibilidades de construcción de un protagonismo femenino en diversas prácticas sociales. En ese contexto, se busca entender como la convergencia entre la Curación Digital y la Ciencia de la Información contribuye en la construcción de acervos en entornos digitales, a partir de la organización, presentación y representación de la información, con vistas a su acceso e intercambio. El objetivo general es contextualizar los conceptos y las definiciones de tales áreas, a fin de identificar articulaciones efectivas para la preservación de acervos digitales de los museos de lo femenino. Los resultados demostraron la necesidad de una reflexión sobre la metodología de la planificación pensada en mejoras continuas de acceso e intercambio de la información. Se considera que la implementación de las estrategias y acciones de la Curación Digital para la construcción de acervos en entornos digitales expanden los objetivos de los museos de lo femenino.

Palabras clave: Ciencia de la Información, Curación Digital, entornos digitales, museos de lo femenino.

1 INTRODUCTION

Changes in daily life and in the way subjects relate to information through Information and Communication Technologies (ICTs) have been constant and, consequently, have expanded the forms of interaction in the infocommunication process on the Web.

On the Web, by providing information related to memory and culture, digital environments of cultural facilities potentiate relationships across different contexts. However, such information requires treatment that includes all the complexity of information systems and informational subjects, in addition to other stakeholders, to provide possibilities for access and sharing.

Coherently, in the museum context, digital collections have assumed structures formed by multiple languages in their organization, representation and presentation which can be experienced in the scientific, cultural and social spheres. Museums that display collections in digital environments, in addition to keeping, preserving and giving access to memory, provide the opportunity to create narratives guided by cultural and social circumstances, which allow information exploration and reflection from different perspectives.

To create meaningful narratives, museums need to cope with functional and educational content and information according to the informational subjects' relationships of perceptions, motivations and expectations on the digital environments of their collections. In this sense, given information organization and presentation, language convergence must understand the structures and attributes of the Web as a communication channel that allows content curation to facilitate information access and retrieval referring to memory and culture, and provoke expressions and ideas to stakeholders.

For the curation of women's museum collections, it is important to provide collections that present themes that favor visibility and expand the possibilities of building a female role in various social practices, by rescuing and giving visibility to the memory of the feminine in search of women's participation in "[...] social, political, cultural and everyday life, both in the past and in the present" (Vaquinhas, 2014, p. 2, our translation).

This chapter aims to understand how Digital Curation (DC),

converged with Information Science (IS), contributes to the development of collections and digital environments with functional proposals for information organization, representation and presentation with a view to access and sharing. The general objective is to contextualize DC concepts and definitions to identify possible articulations for women's museums' digital collections.

For this end, firstly, a bibliographic survey was carried out directed to the treatment of the relations between DC and IS in the women's museums on the digital scope. Subsequently, as a result of the exploration on the Web, a collection of data related to the number of initiatives and women's museums existing on the Web was carried out. The subjects dealt with by genre collections were also described to correlate them with DC practices.

Based on the areas of DC and IS, this set of research actions demonstrated the need for a reflection on the methodology for planning and creating digital environments as a laboratory process, continuous, in perpetual beta, iterative and in successive improvement. Furthermore, these environments' maintenance and support must be constant. Given their complexity; actions designed from the observation and participation of the community, so that improvements in information access and sharing are continuous and the digital environment is efficient and effective for reaching informational subjects.

In this scenario, it is important to highlight that the implementation of DC strategies and actions for the creation of digital environments and, on them, the collections, favors the expansion of the objectives of women's museums through collaborative activities on the Web with the use of ICTs. Various dimensions of women's memory and their preservation can be suggested to promote greater participation for grounding social issue discussions in contemporary times.

2 DIGITAL CURATION ACTIONS IN
INFORMATION SCIENCE

The articulation of languages, technologies and humanities benefits the communication across systems and their interoperability, and provides an opportunity for the interdisciplinarity of Digital Curation (DC) with Information Science (IS). DC addresses approaches based on

methods and strategies for information organization and presentation in digital environments. In this section, DC's actions that contribute to subjects' interaction and participation through information access and sharing are explored.

DC emerged at a time of continuous growth in digital information and the expansion of the internet and ICTs in the end of the 1990s, with interests in digital preservation (Beagrie, 2004; Higgins, 2011). Since its inception, actions for managing digital objects have been presented aiming at providing long-term access and adding value to information; actions linked mainly to digital storage and preservation processes (Beagrie, 2004).

According to Dayse Abbott (2008), there are short-term and long- term advantages in DC implementation. In the short term, the benefits lie in: improving the quality of digital objects; using common patterns; verifying authenticity; formally recording; making the best use of the initial investment; and speeding up information access and sharing (Abbott, 2008). In the long term, the advantages refer to: preserving and protecting digital objects against loss and obsolescence; allowing continuous access and encouraging its reuse; providing information about the context and its provenance; ensuring that they remain meaningful; and creating management infrastructure aiming at preservation and sharing (Abbott, 2008).

Thus, DC has played an extensive role in the managing process of digital objects throughout their lifecycle, as "[...] it reduces threats to their long-term research value and mitigates the risk of digital obsolescence" (Digital Center Curation (DCC), c2021). DC is applicable in different digital object management activities, such as planning, creation, digitization and documentation practices, as well as future availability of access and reuse (Abbott, 2008).

The effectiveness of the described advantages requires an implementation planning, a fundamental step. To this end, the Digital Curation Life Cycle (DCLC), developed by Sara Higgins and used by DCC, is a planning tool comprising continuous processes that require attention and investment, and which adapts to different situations and allows for the identification of the best activities for DC application (Higgins, 2008; DCC, c2021).

The DCLC "[...] ensures that all required stages are identified and planned and necessary actions implemented, in the correct sequence" (Higgins, 2008, p. 135). The model (Figure 1) presents the DC stages divided by blocks of: essential actions, sequential actions and occasional actions.

Figure 1 - Digital Curation Lifecycle
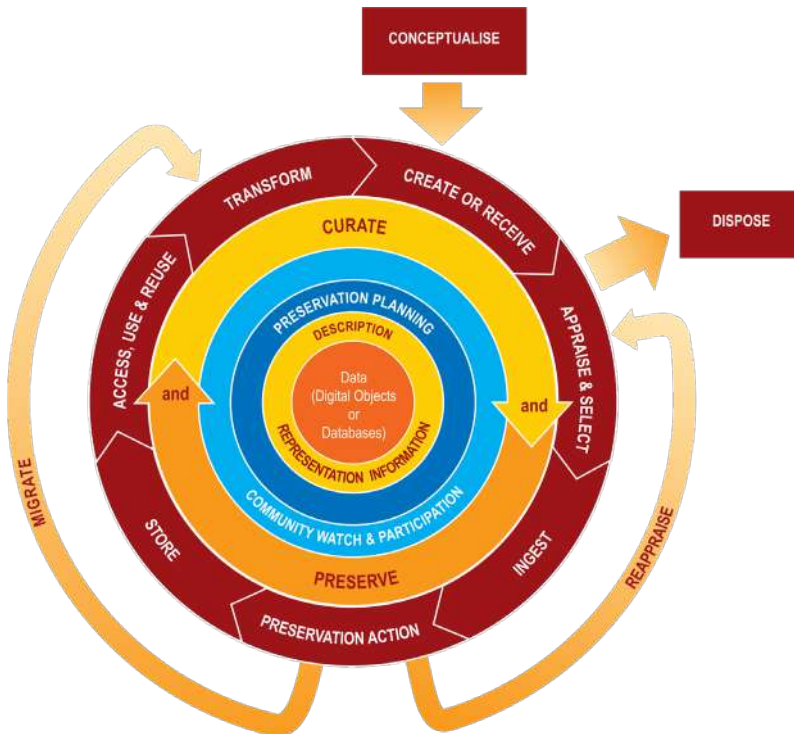
Source: Higgins (2008).

The essential actions block is at the center of the model and comprises: information description and representation, preservation planning, community watch and participation, and curation and preservation. These are interrelated and guiding actions for the development of the entire DCLC, such as the attribution of metadata, planning, watch and verification of curation and preservation activities

(Higgins, 2008).

The sequential actions are distributed in: conceptualizing, creating and receiving, appraising and selecting, ingesting, preserving, storing, access, using and reusing, and transforming. According to Higgins (2008), they are interconnected and following them as a sequence is crucial for an efficient and effective DC, even if not all of them are identified as necessary, due to the contexts in which they will be applied.

Occasional actions are composed of discarding, reappraising and migrating. They are performed in specific periods and in situations defined by policies, legislation, validation failures and the need for format modifications (Higgins, 2008).

Arjun Sabharwal (2015) exemplified each DCLC action from the perspective of Archives, Libraries and Museums, and concluded that the model has useful resources for the conceptualization, implementation and appraisal of digital information. For the author, conceptualization is the most important and necessary task prior to the DCLC implementation, as it analyzes each organizational structure and its types of collections and interests, variables that directly impact action planning (Sabharwal, 2015).

This chapter presents an excerpt highlighting the actions of community watch and participation (described in the center of Figure 1); and access, use and reuse, referred here as information access and sharing (described in the last band of Figure 1). We point out, in this perspective, that the action of community watch and participation is a two-way road that can refer both to professionals – community behind the system – and the subjects who will have access to that information.

Therefore, this chapter seeks the point of view of informational subjects and stakeholders in preparing the information in custody so that it is centered on their contextual needs and on their contribution to discussions about the multivocalities of narratives and stories, through direct communication between the subjects and the museum institution, so that it is also centered on its circulation flow, on the perspective of access in the post-custodial paradigm.

In this context, DC linked to the area of IS, becomes a resource

for actions of planning and management that seek to approach stakeholders. The interdisciplinarity aspect of the area is growing and is essential for collaborating with theories and practices related to the processes of selection, maintenance and preservation of digital objects. Such theories and practices favor scientific, cultural and memory activities, and are concerned with information in its various aspects, moments and instances (Araújo, 2018).

IS is an interdisciplinary area situated as an applied social science, and its convergence with other areas offers improvements in personal and institutional communication efforts. Interdisciplinarity brings out perceptions of properties for the improvement of the infocommunicational process supported by information organization, representation and presentation, mainly by language and system interoperability offered on the Web.

The confluent development of the two areas, and their recent maturation, corroborates to claim that the points of intersection and the interdisciplinary nature of IS and DC also lack multidisciplinary teams, in which it is necessary and imperative to bring together academics, information professionals, designers and technologists to produce solutions to the communication problems that arise.

Thus, the mere availability of information is no longer sufficient, in the same way that the digital object should not be seen in isolation or only in the field of digital preservation. Building a satisfactory relationship among museums, collections and digital environments and their stakeholders is, precisely, to understand the potential offered by all the elements that are part of the systems involved in the actions: they are influencing factors for information access and sharing of collections and, in this way, they expand the discussions and guarantee the social function of these spaces.

3 OVERVIEW OF WOMEN'S MUSEUMS CONVERGED WITH DIGITAL CURATION ACTIONS ON DIGITAL ENVIRONMENTS

The role played by culture and information facilities foster debates that contribute to expanding visibility, empowering groups, developing projects and public policy practices among other

opportunities originating from their actions. For Alice Semedo (2015, p. 11, our translation), museums are "[...] more than institutions for object exhibitions; they are places of interaction between personal and collective identities, between memory and history."

In this sense, the growing agendas related to gender can provoke and support necessary dialogues from actions of memory access, sharing and preservation. Women's museums, in this sense, become fundamental for women's representation and to support their sociocultural confrontations. Women's museums are cultural facilities that can provide other perspectives in the creation of women's history narratives with possibilities of accessing and sharing their collections.

> [...] women's and/or gender museums are opening new doors both in the specifically historiographical field and in raising issues that help to understand the way in which women have shaped their lives and have articulated (and articulate) them with social changes. (VAquinhas, 2014, p. 10, our translation).

The International Association of Women's Museums (IAWM) is an initiative that strives to preserve female memory through cooperation between institutions dealing with women and/or gender around the world (IAWM, 2021). Its three main services are: monitoring associated museums in a database; promoting and publicizing activities and exhibitions via official channels; networking globally to organize conferences, meetings, and discussions with members and non-members; and cooperating to create collaborative projects with other museums (IAWM, 2021).

For the IAWM (2021), women's museums aspire to be their own spaces aimed at education, training and encouraging women's self-confidence, by working to raise awareness through actions aligned with their goals. In its latest update, published in 2021, 146 women's initiatives (projects) and museums around the world were counted, among on-site and on-line. Table 1 presents the numbers according to each region.

Table 1: Number of initiatives and museums around the world

Region	On-site museums	On-line museums	Initiatives	Total
Africa	06	0	08	14
Asia	13	06	04	23
Australia	04	0	01	05
Europe	25	06	23	54
North America	26	04	02	32
Latin America	05	05	08	18
TOTAL	79	21	46	146

Source: prepared by the authors (2021).

Note: data collected from IAWM (2021).

There is a significant performance of women's museums around the world, which is fundamental for memory preservation, for information exchange and for collaboration among them. Of this total, 108 museums have digital environments; however, only 44 display their collections. It is understood, therefore, that the creation of digital collections on the Web would facilitate access, integration and their reach.

Part of the museums' communication structure for the relationship with stakeholders is their presence on the Web. The potential offered by ICTs can be adopted as a means to share their simulacra through multiple languages and different supports resulting in integration and interactivity (Padua, Jorente, & Semedo, 2019).

In addition, access to and sharing of collections on the Web provide greater participation of informational subjects, which can influence perceptions of both individual and collective identities (Semedo, 2015), even considering the contrasts between the numbers of women's museums in the different regions.

The actions of community watch and participation and of information access and sharing proposed by DC allow the planning

of the creation of digital environments to be guided and enhanced by practices of information organization to promote better interaction in the communication process. Due to the information scalability on the Web, curators of women's museums can work with a range of themes that guide the potential of narrative constructions according to their collections.

The project *Patrimonio en femenino* in Spain, from 2010 to 2016, brought together objects held by various museums to

> [...] outline visions of the feminine presence from different angles, contextualizing their protagonism in the most diverse civilizations and from the origins of humanity to the present day. (Carrasco-Garrido & Nuevo-Gómez, 2016, p. 82, our translation).

According to these views, six catalogs were created, consisting of representations of paintings, sculptures, photographs, clothes, furniture, from different Spanish museums.

A final catalog, also part of the project, added items from collections from Argentina, Brazil, Chile, Colombia, Mexico, Portugal and Uruguay as for the partnership with Ibermuseus (Carrasco-Garrido & Nuevo-Gómez, 2016). The central themes unfold into thematic sections, as shown in Chart 1.

Chart 1: Themes incorporated in the *Patrimonio en Femenino* catalogs

Title of the calalog	Section (themes)
Patrimonio en Femenino (2011)	Works carried out by women
	Discourses and models of femininity
	Women's work and knowledge
	Breaks and transgressions
	Perpetuating memory
Absences and Silences (2012)	Authority and power
	Science and education
	Creation and exhibition
	Work and labor
	Rights and equity
Women in adversity: times and setbacks (2013)	Social change
	Subsistence and survival
	Political conflicts and transformations
	Personal territory
	First names
Tradition and modernity (2014)	Faithful to tradition
	The difficult conquest of modernity
	Until the end
	Roundtrip paths
	First-singular person
Eros and Anteros: views on female sexuality (2015)	Eros and Anteros
	Unconfessable secrets
	From Eva to *la femme fatale*: archetypes
	Otherness images
	Living sexuality
	The construction of eroticism
	Curious eyes
	The woman object

Title of the calalog	Section (themes)
Women's memory (2016)	Women and identity: community and interculturality
	Rights and equity
	Symbols and myths around genre
	Heritage's territory

Source: prepared by the authors (2021).
Note: data collected from the *Patrimonio en Femenino* website (2020).

The set of catalogs and the social themes worked on demonstrate how vast the possibilities of converging women's representations are. According to Semedo (2015),

> The growing interest in the field of social sciences has focused on representations of people and places through heritage, both in the historical and contemporary contexts, giving special attention to issues of representation and identity in museums. (p. 12, our translation).

Additionally, sharing museum collections in a digital environment expands physical collections and generates new presentations, contextualization and interpretations based on their objects (Sayão, 2016). Actions aimed at information access and sharing, according to Sayão (2016), manifest in the DC planning open to the possibilities of aggregating content, languages and materials through a collaborative and cooperative space for education and scientific research.

In this way, community watch and participation is an auxiliary method for technical processes - as information representation and organization - to its creation and presentation as form and content. Although the flexibility brought by the Web in information search does not follow the hierarchical patterns based on librarianship practices, allowing collective activity in interpretations, classifications and categorizations opens space to the perception of the community as a resource in the post-custodial context, which has been discussed in IS third paradigm.

From such an interdisciplinary perspective between DC and IS,

the Web platform combines favorable environments to communicate collections' simulacrums, fosters dialogue between women's museums and simultaneously considers the relationship of museum institutions with their stakeholders, since the number of museums that have digital environments is significant. In this sense, it is essential that the DC resources are implemented in practices and methods of organization, representation and presentation of the collections in custody.

4 FINAL CONSIDERATIONS

The described Digital Curation (DC) actions present reflections on the possible application techniques on digital environments, and establish a promising relationship with the community. The planning for such actions must be guided towards an efficient and effective digital information organization, representation and presentation on the Web environments in that information is shared to different subjects, simultaneously and ubiquitously.

From the point of view of museum institutions, it is vital to use such methods and resources to improve their digital environments to promote communication strategies related to their collections, promoting convergence with other online channels and optimizing their visibility, among other objectives.

Although most women's museums have digital environments, the number of collections available online is relatively low, as described above. When analyzing the themes of the *Patrimonio en Femenino* catalogs, clearly, broad narratives can be developed if worked with stakeholders associated with institutions and collections.

In this way, converging the DC actions with the features of Information and Communication Technologies (ICTs) favors the growth of themes related to women on the Web, expands information access and sharing, and provides opportunities for dialogues built through stakeholders' and informational subjects' collaboration and interaction.

By contextualizing DC, which is interdisciplinary to Information Science (IS), we identified contributions to the development of projects within the scope of the digital collections of women's museums. With the community watch and participation, the construction and creation

of digital and informational environments that work as two-way road is proposed, that is, that the resources offered for stakeholders' use can be parameters for information professionals' practices and techniques.

Aspects related to language and system convergence are also discussed within the scope of these collections' organization and presentation of representations and need constant reassessment to find the appropriate solutions in preserving women's memories in different cultures and societies. The extension of such representations to digital-virtual museums results in initiatives that go beyond physical boundaries and are projected in a decentralized way.

Finally, the DC application actions in digital collections of women's museums must be developed and executed from the understanding of the complexity of each of the areas and the actors of the entire infocommunication process as subsystems of a mosaic culture characteristic of postmodernity.

REFERENCES

Abbott, Daisy. (2008). What is Digital Curation? *DCC Briefing Papers*, 1-3. https://www.dcc.ac.uk/sites/default/files/documents/resource/briefing-papers/what-is-digital-curation.pdf.

Araújo, Carlos A. Á. (2018). *O que é Ciência da Informação.* Belo Horizonte: KMA.

Beagrie, Neil. (2004). The Digital Curation Centre. *Learned Publishing*, *17*(1), 7-9. doi: 10.1087/095315104322710197.

Digital Curation Centre (DCC). (2021). *What is digital curation?* https://www.dcc.ac.uk/about/digital-curation.

Carrasco-Garrido, Reyes; Nuevo-Gómez, Alejandro. (2016). Género en red: seis años de Patrimonio en Femenino. En Ministerio de educación, cultura y deporte, *La memoria femenina: mujeres en la historia, historia de las mujeres* (pp. 79-86). Espanha: Iberomuseos. http://www.ibermuseos.org/wp-content/uploads/2018/10/memoria-feminina-es.pdf.

Higgins, Sarah. (2011). Digital Curation: the new emergence discipline. *The International Journal of Digital Curation*, *6*(2), 78-88. doi: 10.2218/ijdc.v6i2.191.

Higgins, Sarah. (2008). The DCC curation lifecycle model. *The International Journal of Digital Curation*, *3*(1), 134-140. doi: 10.2218/ijdc.v3i1.48.

International Association of Women's Museums (IAWM). (2020). *The History of IAWM*. https://iawm.international/?page_id=17.

International Association of Women's Museums (IAWM). (2019). *List of Women's Museums*. https://iawm.international/?page_id=21.

Padua, Mariana Cantisani, Jorente, Maria José Vicentini, & Semedo, Alice. (2019). Design da Informação e ações comunicacionais em websites de museus. En 9º *Congresso Internacional de Design Da Informação* (pp. 1604-1614). São Paulo: Blucher. https://www.proceedings.blucher.com.br/article-details/design-da-informao-e-aes-comunicacionais-em-websites-de-museus-33744.

Patrimonio en Femenino. (2021). *Portada*. Ministerio de Cultura y deporte de España. http://www.culturaydeporte.gob.es/cultura/areas/museos/mc/ceres/catalogos/catalogos-tematicos/patrimoniofemenino/presentacion/portada.html.

Sabharwal, Arjun. (2015). *Digital Curation in the Digital Humanities: preserving and promoting archival and special collections*. Kidlington: Elsevier. https://www.elsevier.com/books/digital-curation-in-the-digital-humanities/sabharwal/978-0-08-100143-1.

Sayão, Luis Fernando. (2016). Digitalização de acervos culturais: reuso, curadoria e preservação. En IV *Seminário Serviços de Informação em Museus*. São Paulo. https://www.researchgate.net/publication/319403030_Digitalizacao_de_acervos_culturais_reuso_curadoria_e_preservacao.

Semedo, Alice L. (2015). Representações e identidade em exposições de museus. *Clío*, *41*, 1-26. https://hdl.handle.net/10216/81857.

Vaquinhas, Irene. Museus do feminino, museologia de género e o contributo da história. *Midas*, (3), 2014. doi: 10.4000/midas.603.

CHAPTER 6

DESIGN AND DIGITAL CURATION FOR A VIRTUAL SPACE THE VISUALLY IMPAIRED*

CRISTINA PORTUGAL
Pontifícia Universidade Católica do Rio de Janeiro

MÔNICA MOURA
Universidade Estadual Paulista

MÁRCIO GUIMARÃES
Universidade Federal do Maranhão

IANA ULIANA PEREZ
Universidade Estadual Paulista

JOSÉ CARLOS MAGRO JUNIOR
Universidade Estadual Paulista

ABSTRACT

The chapter presents the digital curation process of the pilot project "I remembered you" through which a network of volunteers responsible for the organization, reading and production of audios for people with and without visual disabilities, especially for the elderly, established during and after the pandemic to alleviate states of loneliness and provide people with visual disabilities access to stories, poems, among other contributions from the group of volunteer readers. The aim is to promote citizenship and the constitution of the autonomy of the public served from the theoretical and aesthetic concepts, the awakening of recollections and memories that help blind people to elaborate mental images and assist them in the processes of expanding the repertoire knowledge, social integration, improvement of

the quality of life and well-being, meeting the scope of inclusive design and design with social responsibility.

Keywords: Inclusive Design, accessibility, visual impairment, digital platform, pandemic and post-pandemic.

RESUMEN

El capítulo presenta el proceso de curación digital del proyecto piloto "Me acordé de ti" a través del cual se estableció una red de voluntarios responsables de la organización, lectura y producción de audios para personas con y sin discapacidad visual, especialmente para ancianos, durante y después de la pandemia para paliar estados de soledad y brindar a las personas con discapacidad visual el acceso a cuentos, poemas, entre otros aportes del grupo de lectores voluntarios. El objetivo es promover la ciudadanía y la constitución de la autonomía del público atendido a partir de los conceptos teóricos y estéticos, del despertar de recuerdos y memorias que ayuden a las personas ciegas a elaborar imágenes mentales y las asistan en los procesos de ampliación del repertorio de conocimiento, integración social, mejora de la calidad de vida y bienestar, atendiendo el alcance del design inclusivo y del design con responsabilidad social.

Palabras clave: Design Inclusivo, accesibilidad, discapacidad visual, plataforma digital, pandemia y postpandemia.

1 INTRODUCTION

This article presents a research project that brings together the contemporary relations of Design, resuming its guiding principles, expressed from actions related to social responsibility and citizenship, its effective contribution through the existing social problems in the country, which are especially addressed in the sphere of inclusive and accessible design, with priority being given to improving the quality of life and well-being of individuals.

The results of the research carried out indicated the need to establish the group of blind and low vision elderly people as a priority, due to the vulnerability and fragility inherent to these elderly people, especially in the face of loneliness, an issue identified by them as one of the most serious problems. to be faced.

Faced with the situation of social isolation imposed by the SARS - Covid-19 pandemic, this feeling of loneliness is aggravated. This fact leads us to the need to develop practices related to the universe of inclusive and accessible design, guided by a theoretical body that enables an effective system for communication, interaction and integration in a solidarity network for the elderly with visual impairments, providing an effective relationship between the university and society based on the scientific knowledge developed.

In view of these aspects, we will deal in this project with issues related to visual impairment, to Design in the inclusive and accessible social sphere, as well as to the elderly, loneliness or state of loneliness, mental images in visual impairment that are made possible by orality and sound, the role of readers[1] and the process applied. These aspects, added to the theoretical framework, have, among the main authors: Acosta (2016), Amiralian (1997, 2004, 2009), Bomfim (2003), Bonsiepe (1993, 2011), Frascara (2011), Gibson (1962, 1966, 1979), Guimarães (2020), Maldonado (2012), Manzini (2015), Margolin (2006), Margolin and Margolin (2006), Moura *et al.* (2021), Papanek (1971, 1995), Rancière (2009), Redig (1978), Sacks (1995, 1997, 2010), Portugal (2013, 2021) and Vygotsky (1991, 2009), which constitute the framework for the development of this research project.

---

1   Readers are people who read texts and information from different natures allowing blind people or people with severe low vision to be "Ledores."

The central questions of this research are related to the autonomy of the individual, to social integration, to improving the quality of life and well-being of the elderly with accessibility, to people with visual impairments, and, given the scope of inclusive design, they are also directed to elderly people without visual impairment (seers).

Our main objective is the creation, systematization and implementation through the development of a digital platform for management, collection and communication for interaction in a collaborative and solidary network of readers and listeners, aiming at strengthening self-esteem and motivation to promote autonomy and integration. of elderly people with visual impairments.

To meet the objectives, both general and specific, of this research project, we adopted the qualitative method with bibliographic, documentary and field research approaches associated with collaborative and participatory processes with the group served and involving evaluation, validation and improvements in processes developed.

2 WHY THIS PROJECT

By adapting to the countless contemporary cultural, social and technological innovations and dialoguing with different fields of research, design is re-signified and goes through increasingly alternative paths to the initial concepts that associated it solely with industrial production. This project addresses a reflection on the performance of human-centered design and some of its developments such as co-creation and other perspectives of action, supported by an argument built from the discourse of contemporary design scholars. In it, we reflect on the role of design in social contexts, especially in an action in which the subjects participating in the research become co-responsible for the results obtained.

Visual impairment is characterized by the decrease, loss or absence of visual acuity or visual field.These two ophthalmic scales concern the ability or inability to see at a distance (visual acuity) and the amplitude of the area reached by vision (visual field).

The most recent survey on disability in Brazil was carried out

by the Brazilian Institute of Geography and Statistics (IBGE, 2010), being reiterated and published by the Brazilian Council of Ophthalmology (CBO, 2019), and points out that the number of citizens diagnosed with visual impairment has exceededthe mark of 6.5 million people, with 6 million people with low vision and 500 thousand people who are blind.

According to Ottaiano, Ávila, Umbelino and Tuleb (2019), date based on the world population in 2016 show an increase in the number of blind people in the elderly population (over 60 years old) as a result of longer life. More than 82% of all blind people in the world are over 50 years old, despite the high percentage, this group represents 19% of the world population. According to the IBGE (2019), the elderly population should double in Brazil by the year 2042, compared to 2017, when the country had 28 million elderly people, or 13.5% of the total population. In ten years, it will reach 38.5 million (17.4% of the total population).

Faced with this reality and reflecting on the basic principles of design, we are concerned in the search for solutions and contributions to improve the quality of life and well-being of people with visual impairments. And, in recent years, we have dedicated ourselves to the study and research related to the ways in which design contributes to people with visual impairments, which is often referred to as social design.

The question of social or social responsibility, or even inclusive and accessible design, has been on the agenda of several design theorists and professionals in recent decades, resuming a thought that was constituted from the 1930s with the Movement of the League of Physically Disabled in New York, being expanded in the 1950s with the Barrier Free Environments Movement of World War II veterans with disabilities and followed in the 1960s with the organization of the Movement for the Rights of Persons with Disabilities, led by Ed Roberts in the USA.

Driven by practices and applications of design research with humanistic approaches, movements, debates and actions on the performance of design as an instrument of social responsibility emerged between the 1960s and 1980s, among these movements we highlight the Scandinavian socioeconomic policies that took place in the 1960s.1960 in Sweden, which formalized the concept of "a society for all", referring

mainly to issues related to accessibility, a proposal that expanded worldwide when recommended by the Stockholm Declaration, approved on May 9, 2004, by the General AssemblyOrdinary of the European Institute for Inclusive Design, where it was defined, on that occasion, that the built environment, everyday objects, services, culture and information must be accessible, usable by all in society and sensitive to the evolution of human diversity (EIDD, 2004).

Facts that were reflected in the production of Victor Papanek's texts with the social theme in design or in the design acting in social changes or, still, the thought of design for society. Papanek (1971) questions, provokes and calls on designers to become aware of their role related to the social and the sensitive.

These issues are reverberated in the area of design after the attack on the Twin Towers, in the USA, in 2001, with publications that discuss the role of the designer as a citizen. Steven Heller (2003) points out the need for a critical posture in the attitude of designers in their professional performance and also as citizens, recalling Milton Glaser who stated: "Good design is a good citizenship", that is, making a good design is a matter fundamental and indispensable for society and culture; in this case, he refers to good design as an indispensable obligation that adds value to society, expands cultural and social dynamics, and that is why design and citizenship must go hand in hand. "Designers have to be good citizens and participate in building government and society. As designers, we can use our particular talents and skills to encourage others to take action and participate." (McCoy, 2003, p. 15)

In 2004, Sylvia and Victor Margolin published articles in which they discussed and proposed a model for the social practice of design. And they remember that, after Papanek's call, many designers started to act and develop design programs for "social needs, needs of developing countries, special needs of the elderly, the poor and people with physical disabilities" (Margolin, & Margolin, 2004, p. 43). However, they emphasize that there are numerous theoretical and practical models (methods, processes, management, marketing, semiotics, consumption) for market design, but no model for the needs and social practice of design, which includes knowledge about the structures, methods and goals of social design. And they also point out that no attention has been paid to changes in the education of designers, especially with

regard to the development of projects for needy populations.

It becomes evident, both in the authors discussed here and in the basic precepts of design, that the main focus of this area is the human being, however, when we look more closely at this relationship, we realize that when idealizing a project, many designers take into account the profile of a standardized man, defined by homogenized statistical data that do not reflect reality and do not consider the singularities that involve people today.

In this way, we believe that the great challenge of contemporary design is to be developed in a sphere that understands the complexity and diversity of people who live the reality of our time and, therefore, agreeing with the arguments of the authors that we will present in this reflection, we consider that The searchfor a real improvement in the quality of life is configured as one of the aspects encompassed by contemporary design, finding solutions to current social problems, in which one of the most prominent and also complex aspects is inclusion, especially in these times. of social isolation in the face of the Covid-19 pandemic.

In this reflection, we consider human-centered design as a type of contemporary action that promotes the participation of subjects, in which part of the design stages is delegated to non-designers. In this way of designing, it is up to the professional to mediate the interactions necessary for the process, an act that, according to Manzini (2015), represents the end of the imposing strategic position acquired by designers since the industrial age, granting autonomy to the subjects involved in the process. Thus, relevant points already raised by Bonsiepe (2011) are recovered, who argues, based on his solid professional experience, that autonomous production is an alternative to heteronomy and a restorative action, which implies the formulation of more humanist projects.

Contemporary Design goes beyond the new features of form, materialities and immaterialities and the development of new methods that lead to multidimensional features. There is a growing aspect that occurs through services and the search for solutions that can be found in the universe of the sensitive, and these in turn can collaborate for the political and social action of designers.

We live in an environment populated by visual, sound and spatial stimuli, with an excess of information and the imposition of frenetic and accelerated rhythms that can suppress our sensitivity and the ability to perceive and exercise empathy, alterity and dialogue with the other. Studying and analyzing contemporary issues associated with the universe of design, we focus on the possibilities of the exercise and the needs of the contribution of this area to the human being, subject to the changes of our time and our society and we ask ourselves about how to contribute effectively to seek the much desired and talked about quality of life and well-being. One of the paths that are presented is the performance of design beyond materialities, in a universe of the sensitive.

The research project, now presented in this article, "I remembered you Design and Inclusion (in and after) a pandemic with accessibility for elderly people with visual impairments" is based on the development of previous research and research in progress on design and inclusion.

When we had intense contact with the reality of visually impaired people - blind and with low vision - we were faced with the seriousness of the problem caused by loneliness, especially among the elderly. The results of the semi-structured interviews carried out in the field research process showed that the elderly were unanimous in indicating that the biggest problem they face is loneliness[2].

Loneliness or exclusion from activities with family, friends or in public spaces, usually happens because most cases of low vision or absolute blindness come from causes acquired with age or, especially, due to accidents at work or, and diseases resulting from aging.

> Most diseases that cause visual impairments affect the elderly. In the adult population, some of the major causes of blindness are: cataract, glaucoma, diabetic retinopathy, age-related macular degeneration, trachoma and corneal opacities, but the relevance of refractive errors in eye health conditions cannot be disregarded (...). For every blind person, there are, on average, 3.4 people with low vision (...) Studies show that more

2   A state of loneliness is considered as a passing situation in which a person finds himself in a period or phase determined by various circumstances in life.

than 90% of visual impairment in the world is located in developing countries. (CBO, 2019, p. 24).

In social isolation, the feeling of loneliness gets worse and adds to the insecurity and awareness of our fragility and finitude, as we are all at the mercy of a moment to another of being affected by a serious illness that can lead to death or to treatments and invasive procedures.

Also, if contact with other people is not feasible during the pandemic, whether inside homes or in public spaces, one way to reduce the feeling of loneliness is to bring the voice of another common person (not famous people) through. at regular intervals, to those who are in a state of solitude. And what better way to take someone else's voice if not literature in its various genres (narrative, lyrical, dramatic) and also music, life stories, memories, remembrances?

Given this situation, this project aims to address the problem of loneliness or the state of loneliness that affects many people who are in social isolation, working for inclusion and accessibility through design from actions that generate the social integration of the individual from the stimulus and expansion of the perceptual, aesthetic, sensitive, imagery and cognitive repertoire, making it possible to strengthen self-esteem with a view to building autonomy, dignity and, consequently, citizenship.

The social innovation involved in the project will be based on the expected results and occurs especially because there is little bibliographic production with cases and Brazilian reality aimed at people with visual impairments.

3 METHODOLOGY

To meet the objectives, we adopted the qualitative method with bibliographic, documentary and field research approaches, associated with collaborative and participatory processes of the group served and involving evaluation, validation and improvements in the developed processes.

We will take as a basis the Social Model of Design Practice

developed by Margolin (2004), which can be applied with the collaboration of different professionals, be them from health, education, or public administration. Margolin (2004, pp.45-46) points out that the participation of processes and projects involving teams of human services and designers is still open to be explored and that there are two main reasons for the fact that there is no greater support for social design: the absence of a program of education and training in design schools and the absence of research demonstrating how a designer can contribute for the human well-being.

The proposed Margolin model involves 6 stages, namely: 1. Commitment; 2. Evaluation; 3. Planning; 4. Implementation; 5. Estimate; 6. Finalization. Our details involve the following sub-stages: 1.1 Listening to learn about the problem and reality of people served (target audience); 1.2 Involvement in order to search for a joint solution (co-creation, participation, diffuse and specialist design); 2.1 Examine and promote interaction; 2.2 Analyze and understand the problem; 2.3 Generate a list of needs; 3.1 Prioritize urgencies; 3.2 Promotebrainstorming in search of the solution; 3.3 Develop a list of goals and objectives for each one involved in the process; 4.1 Intervene according to goals and goals defined in the planning; 5.1 Evaluate by means of interviews with the public served and validate the process and 6.1 Evaluate the dynamics and the general process. Produce and publish scientific papers, chapters and books about results obtained.

4 PILOT PROJECT I REMEMBERED YOU

The Covid-19 pandemic is undoubtedly a huge challenge for all people in the world. However, the impact comes in different ways and degrees.

In the development of these researches and in the application of projects with groups and institutions of the elderly and blind, it was identified that the great and main problem that affects these elderly, blind or low vision people is loneliness.

Faced with the constitution of a theoretical body and the development of practices related to the universe of inclusive and accessible design in contemporary times, we began to question ourselves what our role was and how we could contribute to people

in general, but with accessibility for those with visual impairments, in the situation of social isolation imposed by the SARS - Covid-19 pandemic. After all, what were we designers doing for the audience we worked with to reduce this feeling of loneliness during quarantine?

Digital curation refers to new practices and methodologies of access, information retrieval and dissemination of digital collections among users, using, for this, methodologies that facilitate the extraction, manipulation and validation of the data obtained, according to the curator of the British Library, Aquiles Alencar Brayner (2017).

And thus, the project entitled I remembered you was born. The purpose of this project is to be inclusive, that is, for all people who are or feel lonely or in a state of loneliness in this pandemic, of any age, and also, accessible to people, elderly or not, with visual impairments, regardless of age, city or location they are in, but as long as they have access to a mobile phone with WhatsApp.

The main objective is to create a network of people who, through their voice and message, awaken feelings of empathy, welcome, comfort and hope to other people in a state of loneliness during the pandemic. To meet this objective, we created a network made up of volunteer mediators/organizers, readers/readers and listeners.

Participants in the Remembered You project are volunteers who work in the organization and mediation group, in the group of readers who, together, serve a network of listeners (individual people, local agents who work with other small groups or communities and institutions for the elderly, youth and children with or without disabilities). This network of listeners was formed with the indications of the project's volunteers and will be expanded through a public relations action.

This is an emergency action to meet the needs of people who feel lonely and isolated, but the project foresees several other more complex actions in the short, medium and long term.

Associating language, orality, literature and other artistic or popular expressions via oral manifestation and bringing together a group of volunteers to be readers forming a network with other people, individually, collectively or institutionally, elderly people with or without visual impairment, we laid the foundation for our inclusive

and accessible design project.

However, the application of the pilot project showed us two extremes. On the one hand, the effectiveness with the positive responses of the listeners served, on the other hand, indicated the pressing need for a broader and deeper systematization to achieve greater effectiveness and better dynamics by expanding accessibility.

The unfolding and expansion of the pilot project "I remembered you" is presented in this research project that is established from the need to involve not only the pandemic period, but also the post-pandemic period, and a systematization via the development of a digital platform for management, communication and interaction.

4.1 Target audience

Elderly, adults and children in isolation during the pandemic, accessible to people with visual impairments (blind and low vision).

4.1.1 Reminder of You working process

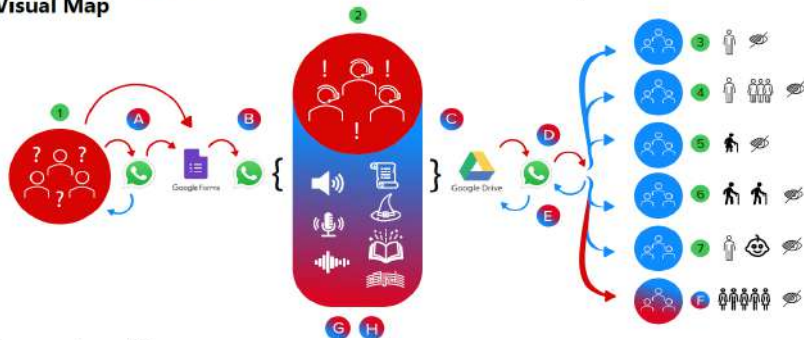The process takes place as follows:

Volunteer participants, whether management or readers, fill out the registration form and confirm that they agree with the Term of Assignment of Use of Audiovisual Resources. After the validation of each volunteer's registration, he is added to a group in which he must send the audios that will be saved in the cloud, cataloged in categories, verified and, later, directed to the listeners; we currently have ninety-three volunteer readers and eighteen volunteers in the organization.

Blind and low vision listeners are registered in WhatsApp groups and receive eight audios per week. Listeners are divided into categories: individuals, groups and institutions. Currently, we have 678 registered listeners, of which around 550 are assisted in institutions that support people with visual impairments, one of which is a long-stay institution for the elderly, located in the state of São Paulo and Minas Gerais. The other 128 listeners are distributed in groups with people of different ages, sighted, blind and with low vision, from different locations in the Brazilian regions.

The multidisciplinary team was made up of professionals from different areas, designers, illustrators, pedagogues, musicians, programmers and professionals of Letters, led by researchers Mônica Moura, MárcioGuimarães and Cristina Portugal, all designers and PhDs in Design. There are still eighteen people in the organization/mediation. So far, 567 audios have been collected, including tales, poetry, songs, memory reports, among others.

Figure 1: Reading Guide for the Visual Map of the I remembered of you Project

Source: prepared by the authors (2020).

For Volunteers

The volunteer will receive a link for each record. Accessing the link, it will fill with the personal data and must agree with the Term of Assignment to Use Audiovisual Resources and, them, click in SEND.

After validating the record of each volunteer, this one will be added in a group for sending messages using WhatsApp.

In this new group, volunteers must send the audios that will be stored on the Cloud, cataloged, verified and later, directed for the listeners;

The volunteer will receive a PDF file with a suggestion abouthow the recording must be made, the presentation, Project name, type of message, text, poem, tale, and ... the farewell, in order to standardize the approach of audio for this project;

Audios must have a minimum time of two minutes and, at most, 15 minutes. Content may be constituted by histories, tales, stories, music, poems, legends, memories and personal reports of memory (from their Family, their friends or fictional);

The proposal is to have one audio per week for each volunteer, but volunteers are free to send as much as they want;

If some external interference happens, such as noise covering the voice of volunteers, we will indicate (privately), the need of redoing the audio after verification;

The initial group of volunteers will remain active to answer questions and exchange experiences. If there is feedback from any listener or group of listeners, we will also post it in the volunteers group.

For listeners

Listeners will receive an invitation to receive audios. They will have access to one audio per week.

For institutions

The volunteer who assumed the role of public relations (PR)

in the project "I Remembered You" will have to collect the indications of institutions from the other volunteers and, also, make a survey to organize a database of institutions to be served;

The contact with institutions will occur by email from the project (projetolembreidevoce@gmail.com) or WhatsApp to collect the contact data in order to send the form to be filled out;

If the institution agrees to participate, the person responsible for the institution receives a link to access a Google form, which must be filled and, after this stage, the institution's mobile number will be added to start receiving a message once a week during three months. After this period, we will carry out an evaluation of the project. We will adjust according to the needs of each institution. At first we will be able to increase the number of times of sending messages, for example, two days, then three, until reaching a daily message;

The RP monitors the answers of institutions' messages and informs the organizing group in order to send the messages and, subsequently, if institutions ask for message themes or types (poetry, short story, story, music, legend, personal or collective memory report).

Team of Project *I remembered you*

The multidisciplinary team was made up of professionals from different areas, designers, illustrators, pedagogues, musicians, programmers and professionals of Letters, led by Researchers Monica Moura, MárcioGuimarães and Cristina Portugal, all of them designers and doctors in Design. It also has ten people in the organization / mediation; 69 volunteers so far and 300 audios, among tales, poetry, music, etc. recorded and stored for distribution. The audios will be made available weekly to listeners in individual groups, agents of small groups and institutions, the latter being divided into institutions for adults and for children

The innovation involved in the project will take place based on the expected results and occurs especially because there is little bibliographic production with cases and Brazilian reality for people with visual impairments.

And, finally, it is expected to create a digital platform, from the

studies, analyzes, evaluations and surveys carried out, the planning and execution of the beta version of the digital platform for managing communication, collection and distribution of content for the visually impaired ones, including and also targeting visionary people, since accessible and inclusive projects must meet and provide comfort to everyone. Also, it is expected that the results obtained will contribute to the creation of autonomy and, consequently, the well-being and improvement of the quality of life of the individuals participating in the research.

5 CONCLUSION

From the pilot project "I remembered you" and for its deepening, the need was perceived in terms of the search for solutions to create information and communication management systems that are currently inserted in an environment of permanent challenge and that requires updating and development of new forms of presentation, in addition to the traditional ones, in order to make them understandable and usable by people with visual impairments. In this sense, this project searchesfor new models, new methods and new approaches for developing virtual spaces via digital platforms to reduce the state of loneliness in which these people find themselves, which can provide meaningful information and create pleasant experiences, moreover, as mentioned earlier, to expand the repertoire of information, as well as the aesthetic and the sensitiveness to stimulate mental images, memories and memories, aiming to strengthen self-esteem and to promote motivation for the construction of autonomy and, consequently the inclusion of blind people in society, with low vision and the elderly, but including sighted elderly people.

The digital curation of this project started from the definition of activities involved in data management, from the planning of their creation to the development of the audio storage system and its distribution.

Starting from an online meeting with the main stakeholders, the volunteers were selected and registered for producing the audios. Then, the group of listeners and institutions was selected, in order to have a database of those involved in the project.

The digital curation also included the management of data sets -audios, volunteers, listeners–so that they data can be accessed and searched in order to be ready and continuously interpreted. Digital curation extends beyond the control of the repository that files the data. Attention is needed in managing the entire life cycle of digital material.

As for the development of the digital platform, the aim is to create a space that facilitates the reception and distribution of content. The strategic, methodological resources and technologies involved in digital curation practices can facilitate access to data (audio), as well as their archiving and distribution, by improving the quality of these data, their research context and checking the received audio quality. In this way, the curator can ensure that this data is valid as records, so that the data can be used immediately as it is being distributed as shown in the project's Visual Map Reading Guide and in the future, through the digital platform. In addition, it is worth noting that using patterns across different datasets can create more opportunities for cross-sectional searches and collaboration.

REFERENCES

Acosta, Alberto. (2016). *O Bem Viver: uma oportunidade para imaginar outros mundos*. São Paulo: Elefante.

Amiralian, Maria Lúcia T. (1997). *Compreendendo o cego: uma visão psicanalítica da cegueira por meio de desenhos-estórias*. São Paulo: Casa do Psicólogo.

Amiralian, Maria Lúcia T. (2004). Sou cego ou enxergo? As questões da baixa visão. *Revista Educar*, (23), 15-20.

Amiralian, Maria Lúcia T. (Org.). (2009). *Deficiência Visual: perspectivas na contemporaneidade*. São Paulo: Vetor.

Bomfim, Gustavo Amarante. (2003). As possibilidades do design: entre utopias e realidades. In *Anais do Simpósio Laboratório de Representação Sensível* (LaRS). Rio de Janeiro: PUC-Rio.

Bonsiepe, Gui. (1993). *Las siete columnas del diseño*. Havana: ONDI/ISDI.

Bonsiepe, Gui. (2011). *Design, Cultura e Sociedade.* São Paulo: Blucher.

Brayner, Aquiles Alencar. (2017). *A curadoria digital de Aquiles Alencar Brayner e a criação de um acervo BNDigital Afro-Brasileiro.* Rio de

Janeiro: Biblioteca Nacional. https://www.bn.gov.br/acontece/noticias/2017/03/curadoria-digital-aquiles-alencar-brayner-criacao-um.

Conselho Brasileiro de Oftalmologia (CBO). (2019). *As condições de saúde ocular no Brasil.* São Paulo: CBO.

European Institute for Design and Disability (EIDD). (2004). *Declaração de Estocolmo.* Assembleia Geral Ordinária do Instituto Europeu para o Design Inclusivo. http://dfaeurope.eu/wp-content/uploads/2014/05/Stockholm-Declaration_portuguese.pdf.

Frascara, Jorge. (2011). O papel social do Design Gráfico. Revista Design de Interiores. En M. Braga. *O papel Social do Design Gráfico: história, conceitos e atuação profissional*. São Paulo: Editora Senac.

Gibson, James. (1962). Observations on active touch. *Psychological Review*, *69*(6), 477-491.

Gibson, James. (1966). *The senses considered as perceptual systems.* Boston: Houghton Mifflin.

Gibson, James. (1979). *The ecological approach to visual perception.* Hillsdale: Lawrence Erlbaum Associates Publishers.

Guimarães, Márcio J. S. (2020). *Design inclusivo na contemporaneidade: diretrizes ao desenvolvimento de materiais didáticos acessíveis para crianças cegas e com baixa visão.* (Tesis doctoral). Faculdade de Arquitetura, Artes e Comunicação, Universidade Estadual Paulista "Júlio de Mesquita Filho", Bauru, SP, Brasil.

Heller, Steven, & Vienne, Veronique. (Org.). (2003). *Citizen Designer: perspectives on Design Responsibility*. New York: Allworth Press.

Instituto Brasileiro de Geografia e Estatística (IBGE). (2010). *Dados censitários: 2010*. http://www.ibge.gov.br/estadosat/temas.php?sigla=ma&tema=censodemog2010.

Instituto Brasileiro de Geografia e Estatística (IBGE). (2019). *Resultado da busca sobre idosos.* https://www.ibge.gov.br/busca.html?searchword=idosos&searchphrase=all.

Maldonado, Tomás. (2012). *Cultura, sociedade e técnica*. São Paulo: Blucher.

Manzini, Ezio. (2015). *Design when everybody designs: an introduction to Design for Social Innovation*. London: MIT Press.

Margolin, Victor. (2006). O designer cidadão. *Revista Design em Foco*, *3*(2), 150-154.

Margolin, Victor, & Margolin, Sylvia. (2004). Um Modelo Social de Design: questões de prática e pesquisa. *Revista Design em Foco*, *1*(1), 43-48.

MCcoy, K. (2003). Good Citizenship: design as a social and political force. In S. Heller, & V. Vienne (Org.). *Citizen Designer: perspectives on design responsibility* (pp. 2-8). Nova York: Allworth Press.

Moura, Mônica. (2018). Design para o sensível: políticas e ação social na contemporaneidade. *Revista de Ensino em Artes, Moda e Design*, *1*, 44-67.

Moura, Mônica, Portugal, Cristina, & Guimaraes, Marcio. (2021). Design in times of pandemics: accessible literature to people with visual impairment. Proceedings of EVA London. DOI: 10.14236/ewic/ EVA2021.28.

Ottaiano, José Augusto Alves, Ávila, Marcos Pereira de, Umbelino, Cristiano Caixeta, & Taleb, Alexandre Chater. (2019). *As condições de saúde ocular no Brasil 2019*. São Paulo: Conselho Brasileiro de Oftalmologia.

Papanek, Victor. (1971). *Design for the real world.* Londres: Thames & Hudson.

Papanek, Victor. (1995). *Arquitetura e design: ecologia e ética*. Lisboa: Edições 70.

Portugal, Cristina. (2013). *Design, Educação e Tecnologia.* Rio de Janeiro: Rio Books.

Portugal, Cristina. (2021). *Design * Tecnologia.* http://dxtdigital.com. br/dxt/index.html.

Rancière, Jacques. (2009). *A partilha do sensível: estética e política*. São Paulo: Editora 34.

Redig, Joaquim. (1978). *Sentido do Design.* Rio de Janeiro: UERJ.

Sacks, Oliver. (1995). *Um antropólogo em Marte*. São Paulo: Companhia das Letras.

Sacks, Oliver. (1997). *A ilha dos daltônicos.* São Paulo: Companhia das Letras.

Vygotsky, Lev. (1991). *Pensamento e linguagem.* São Paulo: Martins Fontes.

Vygotsky, Lev. (2009). *A construção do pensamento e da linguagem.*
São Paulo: Martins Fontes.

C H A P T E R   7

THE ROLE OF DIGITAL PRESERVATION IN DIGITAL CURATION

JOSÉ CARLOS ABBUD GRÁCIO
Universidade Estadual Paulista

TELMA CAMPANHA DE CARVALHO MADIO
Universidade Estadual Paulista

ABSTRACT

Currently, information has been increasingly produced in digital format, thus new ways of preserving and providing access on its features are required. Preserving digital information against constant changes and advances as well as ensures its veracity is the current challenge. The digital preservation field is multidisciplinary and involves some aspects, such as: technical – related to the selection of what is necessary to be preserved, the use of models and standards, setting up technological infrastructure for preservation and access, application of the appropriate strategies, proper support usage, and metadata representation; organizational – related to management activities; legal – dealing with copyright issues, laws, rules and recommendations; cultural – related to the ability to assimilate changes that digital preservation generates in the entire informational process. This chapter presents the concepts that substantiate digital preservation, detail their aspects and show how they are related to Digital Curatorship life cycle.

Keywords: Digital preservation, digital object, organizational culture, Digital Curation.

RESUMEN

La información ha sido producida cada vez más en forma digital y sus características demandan nuevas formas de preservar y proporcionar su acceso. El desafío actual es cómo preservar la información digital ante los cambios y avances constantes, garantizando su autenticidad. El campo de la preservación digital es multidisciplinar e involucra aspectos: técnicos, relacionados con la selección de lo que preservar, la utilización de modelos y estándares, el montaje de la infraestructura tecnológica de preservación y acceso, la aplicación de las estrategias adecuadas, al uso del soporte adecuado y la representación por metadatos; organizacionales, relativos a las actividades de gestión; legales, que tratan de cuestiones como derechos de autor, leyes, normas y recomendaciones; culturales, relacionados con la capacidad de asimilación de los cambios que la preservación digital genera en todo el proceso informacional. Este capítulo presenta los conceptos que fundamentan la preservación digital, detalla sus aspectos y cómo estos están relacionados con el ciclo de vida de la Curación Digital.

Palabras clave: Preservación digital, objeto digital, cultura organizacional, curación digital.

1 INTRODUCTION

Information, especially since the emergence of the Internet, has been increasingly produced digitally. Digital information presents features that demand new ways of preserving and providing access to it in the face of new challenges, such as changes in formats, supports, software and hardware, produced volume and access mechanisms. One of the current challenges is how to preserve and maintain access to digital information in the face of constant changes and advances, ensuring its authenticity and integrity.

Digital information is part of the historical and cultural heritage, and providing its continuous access is deemed necessary as it means maintaining the memory of people and institutions, in addition to meeting legal requirements. Digital information is recorded in digital objects, which have their own specificities and must be preserved in the face of innovations and advances in information and communication technologies. The digital preservation of these digital objects must consider their entire lifecycle, that is, from production, storage, processing, use and destination.

This chapter aims at presenting the concepts underlying digital preservation, its elements and the processes involved in its implementation, and how they are inserted in Digital Curation.

2 DIGITAL PRESERVATION

The concept of Preservation had its international diffusion around 1930, when an attempt to standardize global practices and actions for the preservation, especially, of the most significant monuments and buildings for the collective interest. "Thus, in the 1930s, "preservation" was equivalent to protecting monumental architecture for the future" (Sant'anna, 2015, p. 3, our translation).

In 1972, UNESCO launched a normative instrument resulting from the Convention Concerning the Protection of World Cultural and Natural Heritage, held in Paris in November 1972. With this expanded concept, Preservation is now proposed for various areas, from natural and urban landscapes to human tangible and intangible actions and products (Sant'anna, 2015).

Thus, the concept of preservation expands to "a set of measures and strategies of an administrative, political and operational nature that directly or indirectly contribute to the preservation of the integrity of the materials" (Cassares, 2000, p. 12, our translation).

Conway (2001) corroborates this understanding by claiming that "The essence of preservation management lies in resource allocation. People, resources and materials must be required, organized and put into practice to ensure adequate protection of information sources" (Conway, 2001, p. 14, our translation)

As one of the preservation strategies, it was initiated, from the development of digital technologies, mainly in the last decade of the 20th century, actions that allowed the digitization and availability of collections with the most varied supports, from various institutions worldwide. Even in the simple digitization process, it must be recognized that "Preservation management digital images in archives includes the generation, organization and indexing, storage, transmission and ongoing maintenance of intellectual integrity" (Conway, 2001, p. 23, our translation).

A big step towards greater concern and discussions about Preservation on digital environment was given by UNESCO, in 2003, when it published the Charter on the Preservation of Digital Heritage, highlighting the need to maintain the digital object with strategies throughout its life cycle.

> Continuity of the digital heritage is fundamental. To preserve digital heritage, measures will need to be taken throughout the information lifecycle, from creation to access. Long-term preservation of digital heritage begins with the design of reliable systems and procedures which will produce authentic and stable digital objects. (Unesco, 2003, Article 5).

Therefore, Digital Preservation is beyond making backup copies of digital objects. Despite being an important element for digital preservation, storage and restoration solutions are not sufficient technical actions to ensure preservation, search, retrieval and access to digital objects with authenticity warrant.

Unesco defines Digital Preservation as

processes aimed at ensuring the continued accessibility of digital materials. To do this involves finding ways to re-present what was originally presented to users by a combination of software and hardware tools acting on the data. (Unesco, 2019, n. p.).

Ferreira (2006) adds that Digital Preservation

consists of the ability to ensure that digital information remains accessible and with sufficient authenticity qualities so that it can be interpreted in the future using a different technological platform from the one used at the time of its creation. (p. 20, our translation).

Grácio (2012) defines Digital Preservation as

management processes involved in the administration of necessary activities to ensure that a digital object can be accessed and used in the future, based on the ICTs existing at the time, and with guarantees of its authenticity and integrity. (p. 61, our translation).

In this context, a digital object is "any and every information object that can be represented through a sequence of binary digits", accommodating both born-digital objects and those generated from analog supports (digitization). As examples, we can mention text documents, digital photographs, audiovisuals, audio, databases, Web pages, e-mail messages, research data, among others (Ferreira, 2006, p. 21, our translation).

In this way, Digital Preservation must be inserted in the entire life cycle of the digital object and in the management processes. Consequently, it involves several areas and several professionals of an institution, who must be included in the management processes to ensure the digital objects' preservation and access (Grácio, Troitiño, Madio, Brega, & Moraes, 2020, p. 568).

Faced with changes and advances in Information and Communication Technologies (ICTs) and the obsolescence of file formats, hardware and software, which have accelerated with the Internet, digital object preservation depends on defining when and what

actions must be taken on these objects to maintain them preserved, accessible and authentic.

These changes in ICTs affect institutions, which we highlight, are not only formed by pre-defined hierarchical structures and shaped by legislation and norms, which determine their dynamics and functioning, but are also constituted by their employees, who weave a daily network of bonds, practices and knowledge, permeated by their personal and collective aspects and experiences, determinant in the formation of mental models and paradigms, which result in a specific social and historical construct. All these dimensions, ultimately, form the organizational culture, which will always be unique, as it adjusts to the intrinsic characteristics of this universe, specific to each of its members, and at the same time, to this collectivity.

We have observed that any incorporation, change or reduction in this specific community will cause a great impact and resistance in the adoption of new proposals is often seen. Grácio (2012) highlights that

> In the same way that the organizational culture needed time to be built, sedimented and assimilated by the institution's members, the changes arising from digital preservation also need time. It takes time for people to adapt to the new structure and to inserted it into the organizational culture, as digital preservation belongs to a context of constant advances, changes in the case of digital preservation will occur frequently. However, as soon as digital preservation is inserted in the organizational culture, advances can be assimilated by the institution with greater speed and acceptance. (p. 45, our translation).

As it is a multidisciplinary field, digital preservation involves, in addition to issues related to ICTs and the change in organizational culture, organizational, legal and technical elements, as shown in Figure 1:

Figure 1: Digital Preservation Elements
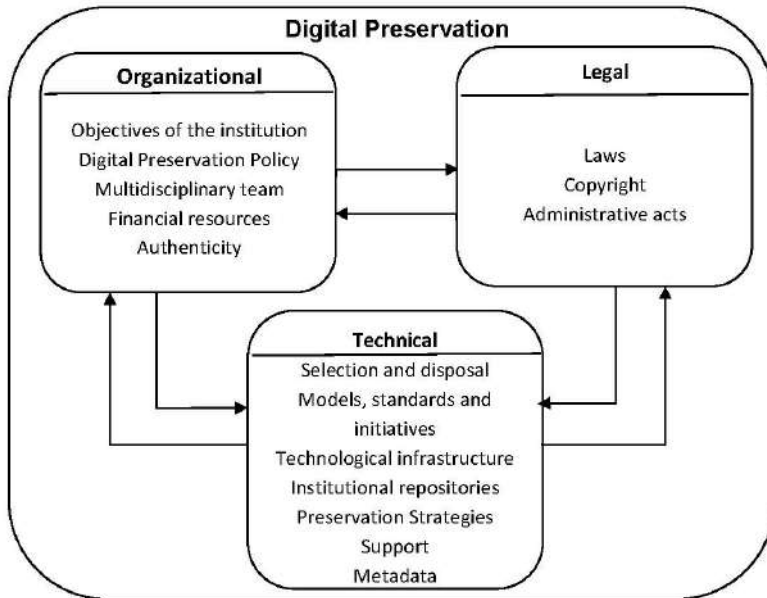
Source: Grácio, Troitiño, Madio, Brega, & Moraes (2020, p. 570, our translation).

The organizational elements are those related to the institution's management activities and "seek to provide organizational support to continue Digital Preservation activities, regardless of changes that may occur in the institution's management, available financial resources or policies" (Grácio, 2012, p. 83, our translation).

They are related to: 1. the duty to include digital preservation in the institution's objectives so that all the involved processes have institutional support; 2. the definition of a Digital Preservation Policy (DPP), to continue digital preservation activities, which must be aligned with the institution's objectives and with other institutional policies; 3. the formation of a multidisciplinary team to manage the processes, activities and people involved in digital preservation; 4. the indication of responsibilities, both sectoral and individual; 5. the permanent obligation to invest in technology, infrastructure and qualified personnel; 6. the need for actions to ensure digital object

authenticity.

The legal elements are related to legal issues such as copyright and the need to define the processes following norms, laws and recommendations that govern digital objects, whether these are international or national norms, which must be complemented by internal acts when necessary. Thus, legitimate digital preservation processes are ensured for the institution and for the creator of the digital object.

The technical elements, in turn, are related to issues involved in computer science, library science, archival science and other related activities. They involve questions such as:

> the selection of what to preserve and what to dispose; the use of models and standards; participation in national and international initiatives that allow exchanging experience and knowledge between institutions; the assembly of the technological infrastructure for the preservation and access to preserved digital objects; the application of appropriate digital preservation strategies; the use of adequate support; and metadata representation. (Grácio, Troitiño, Madio, Brega, & Moraes, 2020, p. 570-571, our translation).

The use of models is essential to standardize the processes involved in digital preservation. The Open Archival Information System (OAIS) is the most cited reference model in the literature and the most adopted for digital preservation solutions. The model is detailed in ISO 14721:2012, which is currently in its 2nd version. In Brazil, it was published in 2007 as ABNT NBR 15472:2007. Its objective is to define and model what is needed to "to develop a system for storage, preservation and access to digital information, and is widely used to develop digital preservation systems" (Grácio, Troitiño, Madio, Brega, & Moraes, 2020, p. 571, our translation). Digital objects and their metadata travel through the model through information packages.

We recommend establishing partnerships and participation in digital preservation initiatives that enable exchanging information and experiences between institutions and professionals responsible for digital preservation processes, whether in technical, legal,

organizational or cultural aspects, helping and optimizing the processes for implementing digital preservation.

Metadata are elements that describe a digital object for its search, retrieval and preservation. They can be descriptive, administrative, technical, structural or preservation. They are essential to assist in proving digital object authenticity, in addition to enabling its search and retrieval. Preservation metadata records all strategies applied to the digital object during its life cycle. An example of preservation metadata is the PREMIS Data Dictionary for Preservation Metadata (Caplan, 2017).

Digital Preservation must cover the entire life cycle of digital objects, from their creation[1], treatment, storage, access and maintenance, involving different actors such as the digital object creator, the institution that maintains them, the technical personnel and their users, going beyond the simple use of tools and software for its preservation.

The implementation of Digital Preservation by an institution depends on the definition of a Digital Preservation Policy (DPP), an action plan and the processes involved to its implementation, which must include ICTs, organizational culture and organizational, legal and technical elements.

A DPP can be defined as:

> a document that defines the objectives and guidelines for the implementation of a preservation program of an institution's records and digital objects. This policy must be aligned with the objectives and other institutional policies in force and be revised over time, covering all elements related to digital preservation, including those related to organizational culture and changes in ICTs. (Grácio, Troitiño, Madio, Brega, & Moraes, 2020, p. 569, our translation).

In this sense, the DPP does not define the specific activities, as this role belongs to the Digital Preservation action plan, which define the procedures, operations and those responsible for the execution of the DPP part or whole.

---

1   Creation is understood for both scanned and born-digital documents.

According to ICA/InterPares (2017) a Digital Preservation plan

> are the actions established to allow the theory to be put into practice. Because they are context-specific, they change more often than the policy, so it is easier to modify them as needed. Procedures can be developed within an organization to support the policy and reflect the organization's specific needs and requirements. (p. 18-19).

Process management requires a multidisciplinary team, which will be the body responsible for planning, drafting standards, defining responsibilities and structuring the institution's areas for activities related to Digital Preservation. This team should be composed of professionals in the areas of digital preservation, institution management, information technology (IT), law, archival science, librarianship, museology, information science, among others.

The use of procedural information management models helps in the process implementation. The model aims to ensure that all processes involved in Digital Preservation are identified, detailed and possible to be implemented.

For Santos (2016):

> the search for a model of information representation that includes creation, appraisal, transformation and access points out that the interest of preserving information in digital media goes beyond the creation and use of systems that meet specific preservation aspects. (p. 455, our translation).

A model with the processes involved in Digital Preservation activities named Procedural Model of Digital Preservation, proposed by Grácio (2012) is presented below. The model is cyclical and defines a set of related processes that enable the long-term preservation of digital objects. As it is a generic model, it can be adapted to any type of digital object and in any institution.

The model is composed of processes, entities and flows. The Processes deal with the actions and elements involved in digital preservation and are represented by rectangles with rounded corners;

Entities are users (internal or external), institutions (Organizations, Educational Institutions, etc.) or situations (ICTs, external environment, culture, etc.) that may, for some reason, interfere with the processes, and are represented by ellipses.

Figure 2: Digital Preservation Procedural Model
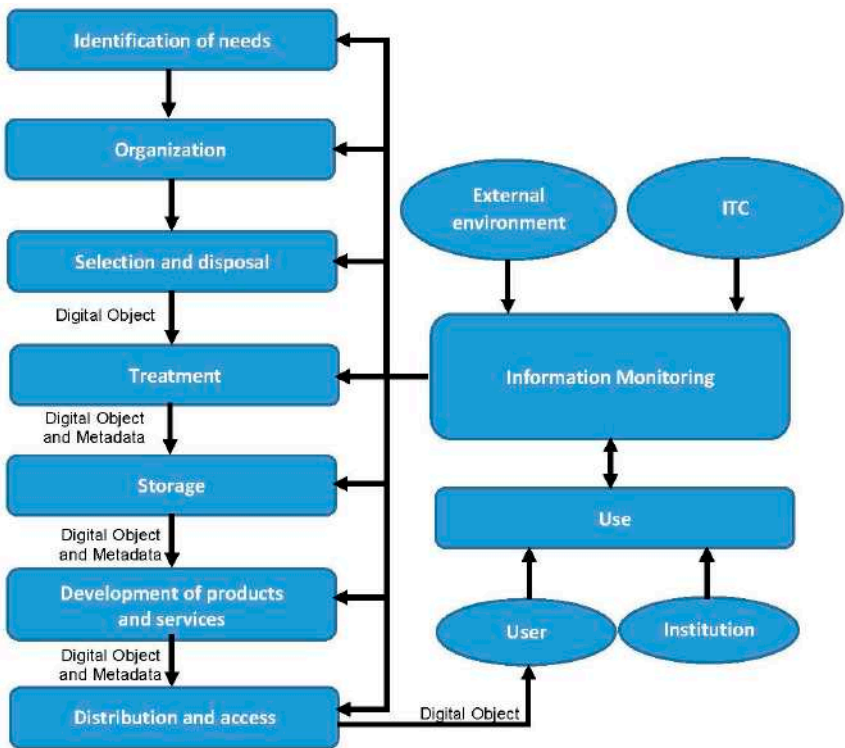
Source: adapted from Grácio (2012).

The institution must be aware of the changes and innovations that occur in ICTs, anticipating the problems affecting digital preservation, applying the necessary preservation strategies and training and motivating the multidisciplinary teams involved in the

processes.

The organizational culture permeates all processes, including the decision, valuation and acceptance ones of the model as it involves existing people and groups in the institutions.

In that regard:

> the model must be structured and assembled with a vision and a way of acting agreed between individuals and their groups, based on elements of the organizational culture and on the defined objectives for the processes involved in digital preservation. (Grácio, 2012, p. 164, our translation).

Process management requires the definition of a normative multidisciplinary team (NMT) and executive multidisciplinary teams (EMT).

The NMT will be responsible for managing the processes and ordering activities within the institution. Its main competencies are

> [...] to set up the necessary management structure within the institution for activities related to digital preservation; define the norms, policies and standards to be adopted and revise them when necessary; define personal and institutional responsibilities; carry out budget planning; identify and define the digital objects to be preserved; define selection, disposal and maintenance criteria; manage and monitor the processes; point out guidelines and criteria to be used in the processes; establish partnerships with other institutions; prepare proposals to be presented to the institution's management bodies; create the EMTs. (Grácio, 2012, p. 165, our translation).

The EMTs are working groups responsible for carrying out the activities established in the processes, with specific functions and technical knowledge. They may as main competences

> [...] define the temporality tables; apply defined metadata templates and standards; define the way institutional repositories work; define the appropriate

supports for each type of digital object; define appropriate strategies for preservation activities; define the necessary technological infrastructure; develop the products and services; adapt distribution and access to existing infrastructure. (Grácio, 2012, p. 165-166, our translation).

Each of the processes is detailed, according to Grácio (2012).

• *Identification of needs*

The identification-of-needs process aims at recognizing which digital objects are the responsibility of the institution, which must be preserved, according to the historical, cultural and legal needs of this organization and its users. It has a direct relationship with the DPP, the institution's objectives and with the organizational culture, as the digital objects to be preserved and, consequently, made available, depend on the information that the institution produces.

• *Organization*

The organization process must deal with the technical infrastructure and personnel, which will meet the technical needs aiming at creating an adequate technological environment for digital object preservation and access. It includes technical training, investment in the necessary infrastructure for storage and access, hardware and software upgrades, computer network upgrades and their services, infrastructure and information security, among others.

• *Selection and disposal*

From the identification-of-needs process, the selection and disposal process aims at defining the priorities of the digital objects to be preserved, their storage time and which ones should be disposed, based on the institution's objectives, the needs' appraisal and the legal criteria pointed out by the multidisciplinary team. Selection and disposal should reflect the institution and users' information needs.

• *Treatment*

The process of treating digital objects is related to metadata description and must be carried out by trained professionals such as librarians and archivists, following standards defined by the multidisciplinary team, which also defines, for each type of digital object, which metadata must be used. The use of standards enables and facilitates interoperability between systems. Metadata can be descriptive, administrative, technical, structural, or preservation.

• *Storage*

The storage process aims at inserting the digital object and its metadata into the technological infrastructure to meet the demand of institutions and users, in the object preservation, search, retrieval and access. Storage must meet two infrastructures: preservation, aiming at storing the digital objects to be preserved and their metadata; and access, to store the digital objects that meet the users' research needs.

• *Development of products and services*

Once the digital objects to be preserved are correctly organized, stored and described, the product and service development process creates and provides an environment for searching and retrieving digital objects in the access infrastructure.

• *Distribution and access*

The access process aims to verify users' access privileges to preserved digital objects, define access formats and generate the information package to be forwarded to the user. Distribution defines how the object will be forwarded to the user using efficient communication channels. The activities involved in the distribution and access process must be in line with products and services as both deal with the main focus of digital preservation, which is the user.

• *Use*

The use process is the stage of process and model appraisal, verifying if the digital objects, products and services are adequately serving the institution and users (internal and external). The appraisal of preserved digital object use within an institution can be carried out in several ways, among them, automatically seeking quantitative information from the systems and services available or through surveys with product and service users.

Access to preserved digital objects by users is the main objective of digital preservation and in this sense the use process is treated as a separate process due to its importance and its strong relationship with the information monitoring process.

• *Information monitoring*

The monitoring process is responsible for monitoring and constantly adapting the processes that comprise the model, in view of the needs of the entities involved in the model (User, institution, ICTs and External Environment), a continuous and dynamic process, which allows pointing out the best solutions for digital preservation within the institution. This process must be managed by a multidisciplinary team that decides on the necessary adjustments to the processes.

3 DIGITAL PRESERVATION IN DIGITAL CURATION

To ensure digital object preservation and access, their management throughout their life cycle is necessary. In this sense, the concept of digital curation emerges, which according to Silva and Siebra (2017, p. 2, our translation) "intends to support digital object reproducibility and reuse as well as their preservation, authenticity and integrity".

Abbott (2008) defines digital curation as:

> the long-term management and preservation of digital data. All activities involved in managing data from planning its creation, best practices in digitization and documentation, and ensuring its availability and suitability for discovery and reuse in the future are part of digital curation. (n.p.).

Digital curation has the following objectives (Abbott, 2008) in relation to digital data: to ensure long-term sustainability; to improve the quality of data and its context by adding value to it; to use common standards in different data sets; to improve reliability; to facilitate persistent access to trusted digital data; to ensure that they can be used in the future as legal evidence and that they are available for use and reuse; to preserve and protect them against loss and obsolescence; to provide information on context and provenance; to use tools and services to migrate data, metadata and other representational information to new formats.

Several initiatives have emerged to study solutions for digital curation and one of them is the Digital Curation Center (DCC), launched in the UK in 2004, "to help solve digital curation and long-term preservation challenges that could not be tackled effectively by any single institution or discipline" (DCC, 2021, n.p.), focusing on managing research data.

The DCC defines digital curation as:

> the long-term management and preservation of digital data/information. It involves maintaining, preserving and adding value to digital research data throughout its lifecycle, increasing the value of existing data by making it available for future high-quality research. (DCC, 2021, n.p.).

DCC has published the Digital Curation Lifecycle Model, a model aimed at curating research data, but which can be suitable for any type of digital object. For DCC a digital object is one composed of a bit string.

The model graphically provides a high-level overview of the life cycle stages required for successful curation. In that regard, "it can be used to: define roles and responsibilities; build frameworks of standards and technologies; and ensure that processes and policies are adequately documented" (Higgins, 2008, p. 135). Figure 3 presents this model.

Figure 3 - DCC's digital curation lifecycle
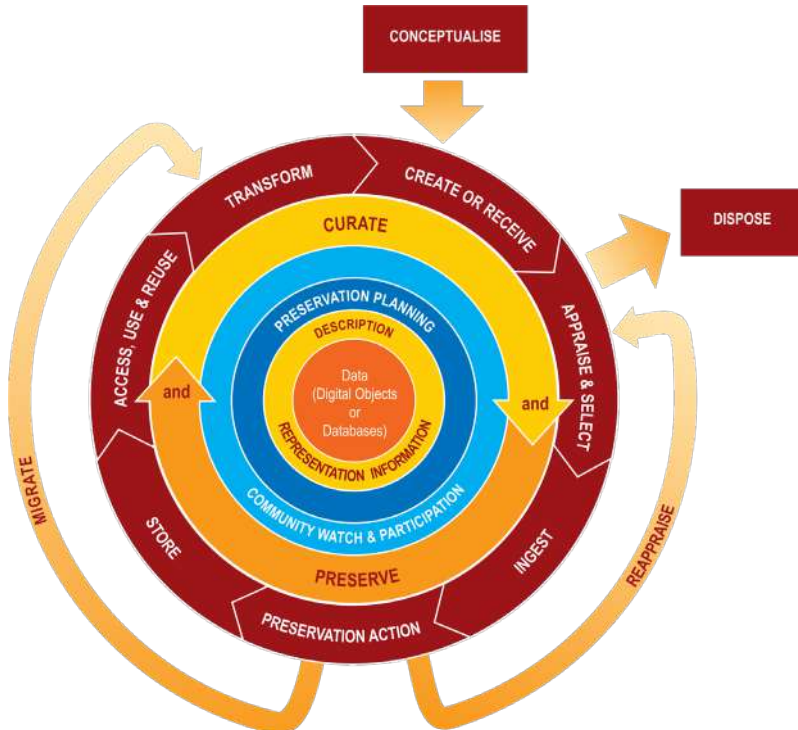
Source: DCC (2021, n.p.).

At the center of the model are the data, defined as any information in binary code, and include the digital objects and database. Around the data are the actions classified into: for the entire life cycle, present during the entire life cycle of the digital object; sequential, which need to be fulfilled, repeatedly, in a cyclical way, forming the bases of the curation chain; occasional, eventually applied due to some decision taken (Sayão & Sales, 2012). Table 1 presents each of the actions.

Table 1: Actions of the DCC's Digital Curation Lifecycle

Actions for the entire lifecycle	
Information description and representation	It involves the attribution of administrative, technical, structural and preservation metadata.
Preservation planning	Related to preservation planning throughout the digital object life cycle.
Community watch and participation	It emphasizes the need for community monitoring and participation involved in digital curation.
Curate and preserve	Be continually alert and undertake planned administrative and management actions for curation and preservation throughout the curation lifecycle.
Sequential Actions	
Conceptualize	Design and plan data creation, including capture methods and storage options;
Create or receive	Create data, including metadata, and receive it according to pre-defined policies.
Appraise and select	Appraise the data and select what will be the object of curation and long-term preservation processes according to policies and legal requirements.
Ingest	Transfer the data to an archive, or repository, or data center or other appropriate custodian.
Preservation action	Undertake actions to ensure long-term preservation and retention of official data, ensuring that data remains authentic, reliable and usable, while maintaining its integrity.

Store	Store data securely while maintaining adherence to relevant standards.
Access, use and reuse	Ensure that data can be accessed both by your target community and by other users interested in reusing the data.
Transform	Create new data from the original.
Occasional Actions	
Dispose	Delete data that were not selected for curation according to documented policies, guidelines and/or legal requirements. They can be destroyed or transferred to another location.
Reappraise	Return data that fail validation procedures for further appraisal and re-selection.
Migrate	Migrate data to a different format.

Source: adapted from Higgns (2008).

From the DCC Digital Curation Lifecycle Model and the elements and processes involved in digital preservation, we can observe that digital preservation is embedded in the entire digital curation process, as shown in Table 2.

Table 2: Relationship between digital preservation and digital curation

DCC Digital Curation	Digital Preservation	
	Elements	Processes
Information description and representation	Metadata, standards eauthenticity.	Treatment
Preservation planning	Institution's objectives, DPP, responsibilities, financial resources, technological infrastructure, laws and multidisciplinary team.	Identification of needs Organization Information monitoring
Community watch and participation	Organizational culture and responsibilities.	Use Information monitoring
Curate and preserve	Organizational culture, institution objectives, DPP, models, initiatives, copyright, administrative acts.	Information monitoring
Conceptualize	Models.	Identification of needs Storage
Create or receive	DPP, administrative acts, metadata, standards and support.	Identification of needs Treatment

DCC Digital Curation	Digital Preservation	
	Elements	**Processes**
Appraise and select	PPD, laws, copyright, selection and disposal.	Identification of needs Select and dispose
Ingest	Metadata, technological infrastructure, institutional repositories, support and standards.	Treatment Store
Preservation action	ICTs, standards and support.	Information monitoring
Store	Technological infrastructure, institutional repositories and support.	Store Development of products and services
Access, use and reuse	Technological infrastructure, institutional repositories and support.	Development of products and services Distribution and access Use
Transform	Digital preservation is not about data reuse. However, this action is related if this new data has to be treated and stored.	

DCC Digital Curation	Digital Preservation	
	Elements	Processes
Dispose	DPP, laws, copyright, select and dispose.	Identification of needs Select and dispose
Reappraise	Select and dispose	Select and dispose
Migrate	Metadata, authenticity, standards, preservation strategies and Support.	Storage Treatment Development of products and services.

Source: by the authors.

Table 2 shows that elements and processes related to digital preservation are included in digital curation actions, except for data reuse.

4 CONSIDERATIONS

Digital Curation similarly to Digital Preservation involves ensuring long-term access to digital objects, adding value to them. One of the characteristics of Digital Curation, which is discussed in Digital Preservation, is the concern with digital object reuse, especially digital data.

An area associated with Digital Curation to add value to digital objects is data analysis. A data analyst can contribute to the production of structured data and also to the appraisal of offered services and products.

In the same way as digital preservation, Digital Curation involves several areas and, in this sense, there is currently no specific training for a curator who understands all these areas. Thus, both Digital Curation and Digital Preservation must work on digital object management, constituting multidisciplinary teams and in constant exchange with other institutions, favoring contributions and expertise exchange.

In view of the above, it is evident that Digital Preservation is not only the application of preservation strategies on digital environments, as it is inserted in the entire life cycle of the digital object, encompassing technological changes and advances, organizational culture and organizational, legal elements and technicians. According to this conception, we have that Digital Preservation takes care of most of the actions recommended by Digital Curation.

REFERENCES

Abbott, D. (2008). What is Digital Curation?. En *DCC Briefing Papers: Introduction to Curation*. Edinburgh: Digital Curation Centre.

Associação Brasileira de Normas Técnicas (ABNT). (2007). *NBR 15472:2007: sistemas espaciais de dados e informações: modelo de referência para um sistema aberto de arquivamento de informação (SAAI)*. Rio de Janeiro: Autor.

Caplan, P. (2017). *Understanding PREMIS.* Washington, DC: Library of Congress Network Development and MARC Standards Office.

Cassares, N. C. (2000). *Como Fazer Conservação Preventiva em Arquivos e Bibliotecas*. São Paulo: Arquivo do Estado e Imprensa Oficial.

Conway, P. (2001). *Preservação no universo digital*. Rio de Janeiro: Projeto Conservação preventiva em Bibliotecas e Arquivos: Arquivo Nacional.

Digital Curation Centre (DCC). (2021). History of the DCC. https://www.dcc.ac.uk/about/history-dccr

Ferreira, M. (2006). *Introdução à preservação digital: conceitos, estratégias e atuais consensos* [Internet]. Guimarães (Portugal): Escola de Engenharia da Universidade do Minho. https://repositorium.sdum.uminho.pt/bitstream/1822/5820/ 1/livro.pdf

Grácio, J. C. A. (2012). *Preservação digital na gestão da informação: um modelo processual para as instituições de ensino superior*. São Paulo: Cultura Acadêmica.

Grácio, J. A., Troitiño, S., Madio, T. C. C.; Brega, J. R. F., & Moraes, M. B. (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 & Inovação em Saúde. https://doi.org/10.29397/reciis. v14i3.2111

Higgins, S. (2008). The DCC curation lifecycle model. *International Journal of Digital Curation, 3*(1). https://doi.org/10.2218/ijdc. v3i1.48

ICA/InterPARES. (2017). *Desarrollo de políticas y procedimientos para la preservación digital.* (Barnard, A., Delgado, A. & Voutssás, J., Trad.). Archivo General de la Nación. http://iibi.unam.mx/archivistica/ InterPARES_2_020617.pdf

ISO 14721. (2003). *Space data and information transfer systems – Open archival information system – Reference model.* Autor.

Sant'anna, M. (2015). Preservação como prática: sujeitos, objetos, concepções e instrumentos. En Rezende, M. B., Grieco, B., Teixeira, L., & Thompson, A. (Eds.). *Dicionário IPHAN de Patrimônio Cultural.* Rio de Janeiro, Brasília: IPHAN/DAF/Copedoc.

Santos, T. N. C. (2016). Curadoria digital e preservação digital: cruzamentos conceituais. *RDBCI: Revista Digital de Biblioteconomia e Ciência da Informação*, *14*(3), 450–464. Doi: https://doi. org/10.20396/rdbci.v14i3.8646336

Silva, F. M. O., & SIEBRA, S. A. (2017). Análise de Modelos de Ciclos de Vida para Curadoria de Objetos Digitais. En *Encontro Nacional de Pesquisa em Ciência da Informação (anais)*, 18. Marília: UNESP. http://enancib.marilia.unesp.br/index.php/xviiienancib/ENANCIB/ paper/view/615/875

Sayão, L. F., & Sales, L. F. (2012). Curadoria digital: um novo patamar para preservação de dados digitais de pesquisa. *Inf. & Soc.: Estudos, 22*(3), 179-191.

UNESCO. (2003). *Charter for the Preservation of the Digital Heritage.* Autor. https://www.iccu.sbn.it/export/sites/iccu/documenti/ carta_UNESCO_eng.pdf

UNESCO. (2019). *Concept of digital preservation.* Autor. https:// en.unesco.org/themes/information-preservation/digital-heritage/ concept-digital-preservation

UNESCO. (1972). Convenção sobre a proteção do Patrimônio Mundial Cultural e Natural. Autor. https://whc.unesco.org/archive/ convention-pt.pdf

C H A P T E R   8

INFORMATION RETRIEVAL:
REPRESENTATION OF THE SUBJECTIVE

EDBERTO FERNEDA
Universidade Estadual Paulista

ABSTRACT

Information retrieval designates the operation by which documents are selected from a collection based on a specific informational demand. A document is retrieved if its representation totally or partially coincides with the representation of the user's need. The correct interpretation of such representations is fundamental for an information system efficiency, which involves processes whose formalization and automation are only possible through simplifications of typically subjective concepts. These simplifications directly or indirectly affect the information system efficiency. This work presents and assesses the forms of computational representation of concepts and operations part of the information retrieval process. The automation of the information retrieval process allows to operate large amounts of data in a fast and agile way, but it does not necessarily provide consistent or satisfactory results. Judging the relevance of information implies procedures based on human capacities and abilities of abstraction, apprehension and representation of its meaning.

Keywords: information retrieval, information representation, meaning of information, relevance, subjectivity.

RESUMEN

La recuperación de información designa la operación mediante la cual se seleccionan los documentos de una colección en función de una demanda determinada de información. Se recupera un documento si su representación coincide total o parcialmente con la representación de la necesidad del usuario. La correcta interpretación de tales representaciones es fundamental para la eficiencia de un sistema de información, que involucra procesos cuya formalización y automatización solo son posibles por medio de simplificaciones de conceptos típicamente subjetivos. Estas simplificaciones afectan directamente en la eficiencia de los sistemas de información. Este trabajo presenta y evalúa las formas de representación computacional de los conceptos y operaciones que hacen parte del proceso de recuperación de información. La automatización del proceso de recuperación de información viabiliza la operación de grandes cantidades de datos de forma rápida y ágil, pero no necesariamente proporciona resultados consistentes o satisfactorios. El juicio de relevancia de la información implica procedimientos basados en las capacidades y habilidades humanas de abstracción, aprehensión y representación de su significación.

Palabras clave: recuperación de información, representación de la información, significación de la información, relevancia, subjetividad.

1 INTRODUCTION

The search for information using some type of technological resource has become a common activity in contemporary society. When we search on the Web, we are looking for information to satisfy a certain need. Information is considered relevant if it brings the knowledge we need at a given time, in a given situation.

The idea of using electronic devices in the search for information had its genesis with the works by Paul Otlet (1934) and later with the article entitled "As We May Think", by Vannevar Bush (1945). The ideas conveyed in these works paved the way for several studies in the following decades. In the early 1950s, mathematician, physicist and computer scientist Calvin Northrup Mooers (1951) created the term "Information Retrieval", inaugurating an area of research that has consolidated and strengthened over the years. The popularization of the Internet and the emergence of the Web have brought new challenges and great interest in research and development of techniques to assist in information search and retrieval in this worldwide collection.

From the first investigations to the present day, the role of information retrieval systems has gone from simple experimental tools to systems for everyday use, useful to everyone who needs information for their activities. During this period, the accelerated technological advance and countless ideas, concepts and techniques were proposed and developed. However, the search for relevant and useful information is still an arduous task. This difficulty leads to reflection on the main elements involved in the information retrieval process, which are apparently alien to technological advances, or at least to the technologies currently available (Ferneda, 2013).

Information retrieval is the operation through which documents from a collection are selected according to a certain information demand. In essence, retrieval occurs through the comparison between document representation and the user's information need representation. A document is retrieved if its representation fully or partially matches the representation of the user's need. Retrieving information therefore implies operating selectively on a set of information items, which involves processes whose formalization and automation are only possible through simplifications of typically subjective concepts (Ferneda, 2003).

The objective of this text is to assess the forms of computational representation of the inherently subjective concepts and operations that are part of the information retrieval process.

2 THE RELEVANCE OF RELEVANCE

The concept of relevance is crucial in Information Retrieval, often used in the statement of the objectives of this area. It is a fundamental issue and a central concern for the functioning and assessment of information retrieval systems (Saracevic, 2017; Mizzaro, 1997; Cooper, 1971).

The term "relevance" is generally used to identify an element that stands out in a given set. It is also used to discriminate an object "of great value or interest", or even to refer to "what matters or is necessary"[1].

The concept of relevance can be expressed by different terms. Vannevar Bush (1945) used the expression "item of momentary importance"; Mooers (1951) referred to "useful information". Terms such as "relevant", "valuable", "useful", "significant" are used in different connotations, but usually with meaning underlying relevance.

> As most fundamental notions, relevance is intuitively well understood – nobody has to explain it to anybody in the world. That is its strength. That is why the systems aiming at retrieval of relevant information to users, including search engines and a variety of search apps in social media, are so well accepted globally – differences in cultures, societies, and mores do not matter. However, relevance is a human, not a technical, notion. That is its weakness. As all human notions, relevance is messy. Relevance encompasses many variables that are hard to control and even fathom formally. Relevance always, repeat always, involves a context as well. All the search algorithms in all the systems in the world are trying to approximate, with various degrees of success, the human notion of relevance. That is what they are all about, that is why they exist. (Saracevic, 2015, p. 27).

---

1   FERREIRA, Aurélio Buarque de Holanda. Novo Dicionário da Língua Portuguesa.

Relevance always involves a relationship. There is always a "to" associated with relevance that refers to a context, an issue in question. Something is relevant to someone or to a certain context. The concept of relevance is not necessarily binary, there are degrees that change as intentions and cognitive horizons change, or when the subject in question changes (Saracevic, 2017, p. 17). According to Sperber and Wilson (2005, p. 224, our translation), "intuitively, relevance is not a matter of all or nothing, but a matter of degrees". Assigning these degrees of relevance is an inherently subjective process.

Saracevic (1975), Swanson (1986) and Harter (1992) distinguish two types of relevance: "objective relevance" and "subjective relevance". Objective relevance is related to the systems, while subjective relevance is related to the operation and use of such systems by their users. According to Swanson (1986), in an information retrieval system it is up to the user to judge the relevance of the information resulting from a search. This arbitration carries an individual character, a "mental experience" based on each user's characteristics. Saracevic (2017, p. 24) argues that systems are created by different designers who use different approaches and different development methods. So, in a way, systems are also subjective. Therefore, according to the author, there is no "objective" relevance. Every relevance is subjective, even when formalized in an algorithm.

Similar to the objective-subjective dichotomous classification, several authors use the terminology "system relevance" and "user relevance" (Mizzaro, 1997). The system relevance is a potential relevance that is assumed, defined and formalized from hypotheses or conjectures related to the representation structure of information items, the way these items are organized and the degree of similarity of each item in relation to the search expression. On the Web environment, for example, considering its structure formed by a set of pages connected by links, Google's basic algorithm (PageRank) starts from the idea that the number of links a web page receives from other pages can serve as a measure of its relevance (Brin & Page, 2012). Library systems use relevance criteria adapted to the representation structure of the items in their collection. The Primo[2] system ranks the results of a search

2   Ex-Libris Primo is a set of tools developed and marketed by the company Ex-Libris that implement search and retrieval resources for digital object collections.

based on the following relevance criteria (Ex Libris, 2015):

1. How well an item matches the query. An item is considered more relevant if the query terms occur in specific metadata fields of the item record (author, title, subject) and if the record's terms appear in the same order as the query;

2. The academic importance of an item. The academic significance of the item is calculated from factors unrelated to the query. To calculate the academic importance of an item, it considers whether it was published in a peer-reviewed journal, the number of citations, among other characteristics;

3. The relevance of an item to the search type. The system infers the type of search the user is conducting. In a search for a broad or generic subject, the system adds reference articles to its results. In searches for more specific items, the system considers authors, titles or other characteristics to place some items at the top of the results list.

4. How current an item is. It is assumed that users generally prefer recent materials.

A retrieval system assigns relevance following criteria formalized by its algorithms. These algorithms have the main function of comparing the representation of each document in the collection with the search expression expressed by the user. The result of this comparison is a numerical value that represents the degree of relevance of each document in relation to the search. This degree of relevance is generally used to order (rank) the set of documents resulting from a search.

From the set of documents resulting from his search, the user judges the relevance of the items retrieved data (user relevance) using their knowledge on the researched subject. Borlund (2003) argues that relevance is a multidimensional cognitive concept whose meaning is largely dependent on users' perceptions and their needs. The user's judgment of relevance is initially based on their need for information. However, the importance given to certain dimensions of relevance can change dynamically, as the user advances in the result analysis.

The concept of relevance has played an important role in information retrieval system development. If the efficiency of a system

lies in its ability to retrieve relevant documents, this efficiency can be measured by the proximity between the system relevance and the relevance for the user. The system relevance can be formalized using characteristics related to the item organization and representation in a collection. However, the relevance for the user escapes any kind of formalization or representation.

3 THE REPRESENTATION INCOMPLETENESS

> ...In that Empire, the Art of Cartography reached such Perfection that the Map of a single Province occupied an entire City, and the map of the Empire, an entire Province. Over time, these Huge Maps were not satisfactory and the Colleges of Cartographers put up a Map of the Empire that had the size of the Empire and punctually coincided with it. Less accustomed to the study of cartography, the following generations understood that this dilated Map was useless and not without impiety, they delivered it to the inclemencies of the Sun and Winters. In the Western deserts, the shattered ruins of the map remain, inhabited by animals and beggars; in the whole country there is no other relic of the Geographical Disciplines. (Suárez Miranda, Viajes de varones prudentes, book four, chapter. XLV, Lérida, 1658, our translation).
>
> Jorge Luis Borges – from rigor in science

Every representation is incomplete. If it weren't incomplete, it wouldn't be a representation. A representation is usually shorter or briefer than the represented object, restricted to the considered most relevant characteristics. Therefore, creating a representation involves choices about what will be included in it and what will be discarded. Something of the original is always lost. A representation will always be a distorted version of the real, even if only for its incompleteness (Saracevic, 1991).

The information retrieval process involves two representation instances: the representation of each information item from a given

collection and the representation of the user's information need through a search expression (query). According to Belkin, Oddy and Brooks (1982a), these two representations are distinct in nature. An information item (document) is the representation of a "coherent state of knowledge", while a query is the representation of an "anomalous state of knowledge". There are situations where the user is able to specify exactly what information is needed to solve a given problem. However, the most common situation is when the user does not have prior knowledge of the information he/she needs, nor is he/she able to formalize it in a search expression.

The representation of a document and includes the descriptive elements that identify and characterize it in a collection, as well as the elements indicative of its informative content. Figure 1 illustrates the elements of the document representation process defined by Mizzaro (1998).

Figure 1: Representation of the document representation process
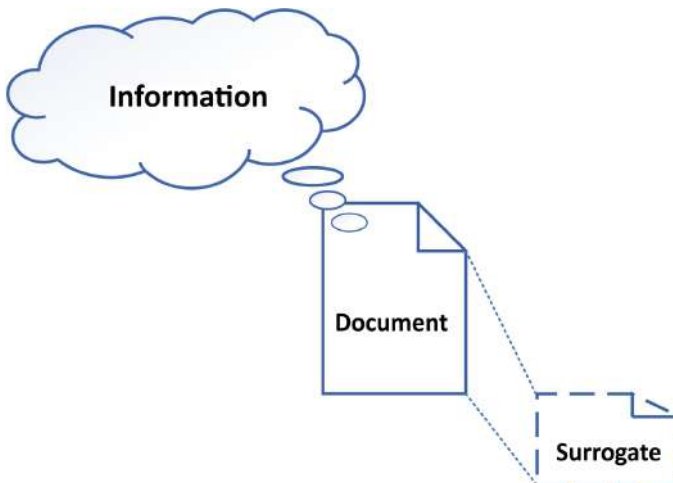
Source: by the author

A document is the physical representation of knowledge, the materialization of information. It is the entity the user of an information retrieval system obtains in response to his/her search. The "surrogate" is the representation of the document, consisting of elements that

distinguish it from other items in the collection. It is the element that will be compared with the search expression, responsible for retrieving the document. Mizzaro (1998) orders these three elements as follows:

surrogate < document < information

In an information retrieval system, the documentary collection is constituted a priori, and can be processed by automated techniques such as automatic indexing, text mining, among others. On the other hand, the user's need for information is only perceived after its enunciation through a search expression and its interpretation is hampered by the reduced number of terms that are normally used. However, from its definition, the search expression can be used in interactive processes that aim to resolve possible ambiguities or that allow its semantic enrichment (Pansani Junior, 2021).

Figure 2 illustrates the process of representing a search defined by Mizzaro (1998). It has four entities

Figure 2: Representation of the search for information process
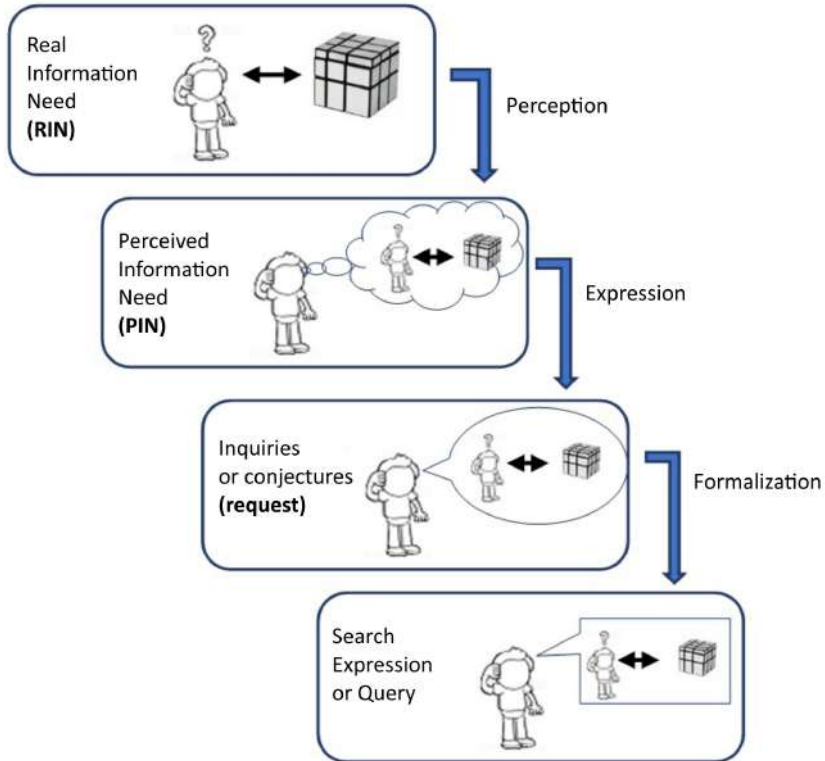
Source: adapted from Mizzaro (1998).

According to Belkin, Oddy and Brooks (1982a; 1982b), an information need arises from a recognized anomaly in the user's state of knowledge about some issue or problematic situation he/she cannot precisely specify what is necessary to solve it. Mizzaro (1998) calls this initial need the Real Information Need (RIN). The user realizes his/her need and builds a mental representation, possibly incomplete or incorrect in relation to the RIN: the Perceived Information Need (PIN). Through conjectures or inquiries (request), the user expresses his/her need in a human language, a natural language. Finally, the user formalizes his/her inquiries in a query using the language provided by the information retrieval system. At each representation level there is a loss or distortion in relation to the previous level. The constituent

elements of this process can be ordered as follows (Mizzaro, 1998):

query < request < PIN < RIN

Therefore, the query is the possibly incomplete linguistic materialization of an information need, after a sequence of mental representations.

In essence, the information retrieval process is carried out by comparing representations: the user's information need representation and each document representation in a collection. The result of this comparison will usually be a number that represents the document relevance degree in relation to the search and will position it in the list of results.

4 MATHEMATICAL INACCURACY

> [...]
> - "All right," said Deep thought. - The Answer to the Great Question...
> - "Yes...!"
> - "Of Life, the Universe and Everything ..." said Deep Thought.
> - "Yes!"
> - "Yes..." said Deep Thought, and paused.
> - "Yes...!"
> - "Is..."
> - "Yes...!!!...?"
> - "Forty two," said Deep Thought, with infinite majesty and tranquility.
>
> Douglas Adams – The Hitchhiker's Guide to Galaxies

The first computers weighed several tons and their programming was done by directly connecting their circuits. In the 1950s, programming was done by transmitting instructions in binary code through cards or punched tapes. With the emergence of

programming languages, binary code was restricted to the core of the computer and communication with the outside world was done by a new program layer. "What was once an interface becomes an internal organ" (Lévy, 1993, p. 101, our translation). Currently, computers are made up of a set of devices and program layers that communicate with each other, allowing a great distance from their binary core.

> Binary, informatics? Undoubtedly, at a certain level of its functioning, but it has been a while since most users have no relationship with this interface. How is a hypertext or a drawing program "binary"? (Lévy, 1993, p. 102, our translation).

In response to the question posed by Pierre Lévy, we can confirm that we currently use a computer without knowledge on how its circuits work, in the same way as we use any other electronic device. However, a computer's binary soul cuts through all its program layers and limits its ability to perform tasks that most humans do with relative ease.

In the information retrieval process, computational resources enable the operation of large document collections, such as the Web. However, the nature of computers requires the mathematization of typically subjective concepts and processes. Relevance, now stripped of its subjectivity, becomes a number. The primary strategy for automating the document representation process (indexing) is simple word count. The words with the highest number of occurrences on the surface of the textual content of a document are elected as representatives of its intellectual content. The need for information is represented by a set of words devoid of their meanings.

The automation of the information retrieval process imposes a logic in which the information must be numerically defined within a closed system, which disregards some human factors involved in this process.

5 CONSIDERATIONS

The term "subjective" is defined as "what belongs to the thinking subject and to his/her innermost being"; "pertaining to or characteristic of an individual; individual, personal, particular"[3]. Subjective is everything that is proper to the subject or relative to it. It is something that is based on an individual interpretation.

The concepts involved in the information retrieval process are typically subjective. The development of computer systems requires simplifications of such concepts so that it is possible to formalize and represent them through algorithms and programs. These simplifications directly or indirectly affect the efficiency of information systems. We have observed that most of the research in Information Retrieval is focused on the search for more efficient ways to represent the subjectivity involved in this process.

The automation of the information retrieval process enables the operation of large amounts of data in a fast and agile way. However, it does not necessarily provide consistent or satisfactory results. Information, considered in its common- sense connotation, is directly related to its meaning, which implies procedures based on human capacities and abilities of abstraction, apprehension and representation of its meaning.

REFERENCES

Belkin, N. J., Oddy, R. N., & Brooks, H. M. (1982a). ASK for Information Retrieval: Part I. Background and Theory. *Journal of Documentation*, *38*(2), 61-71.

Belkin, N. J., Oddy, R. N., & Brooks, H. M. (1982b). ASK for information retrieval: Part II. Results of a design study. *Journal of Documentation*, *38*(3), 145-164.

Borlund, P. (2003). The concept of relevance in IR. *Journal of the American Society for Information Science and Technology*, *54*(10), 913–925.

---

3   FERREIRA, Aurélio Buarque de Holanda. Novo Dicionário da Língua Portuguesa.

Brin, S. & Page, L. (2012). Reprint of: The anatomy of large-scale hypertextual Web search engine. *Computer Networks*, *56*(18), 3825–3833.

Bush. V. (1945). As We May Think. *Atlantic Monthly*, 176, 101–108.

Cooper, W.S. (1971). A Definition of Relevance for Information Retrieval. *Information Storage and Retrieval*, 7, 19-37.

Ferneda, E. (2003). *Recuperação da Informação: análise sobre a contribuição da Ciência da Computação para a Ciência da Informação* (Tesis doctoral). Escola de Comunicação e Artes, Universidade de São Paulo, São Paulo, SP, Brasil.

Ferneda, E. (2013). *Ontologia como recurso de padronização terminológica em um Sistema de Recuperação de Informação* (Relatório de Pós-Doutorado). Programa de Pós-Graduação em Ciência da Informação, Universidade Federal da Paraíba. João Pessoa, PB, Brasil.

Ex Libris. (2015). Primo Discovery: Search, Ranking, and Beyond.

Harter, S. P. (1992). Psychological relevance and information science. *Journal of the American Society for Information Science*, *53*(4), 257–270.

Mizzaro, S. (1997). Relevance: The Whole History. *Journal of the American Society for Information Science*, *48*(9), 810-832.

Mizzaro, S. (1998). How many relevances in Information Retrieval? *Interacting with Computers*, *10*(3), 303–320.

Mooers, C. N. (1951). Zatocoding applied to mechanical Organization of Knowledge. *American Documentation*, *2*(1), 20-32.

Otlet, P. (1934). *Traité de documentation: le livre sur le livre - théorie et pratique*. Bruxelles: Mundaneum.

Pansani, E. A., Jr. (2021). *Contextualização e Expansão de Consultas em Sistemas de Recuperação de Informação: um método baseado em ontologias de domínio* (Tesis doctoral). Faculdade de Filosofia e Ciências, Universidade Estadual Paulista-UNESP, Marília, SP, Brasil.

Lévy, P. (1993) *As tecnologias da Inteligência: o futuro do pensamento na era da informática*. São Paulo: Editora 34.

Saracevic, T. (1975). Relevance: A review of and framework for the thinking on the notion in information science. *Journal of the American Society for Information Science*, *26*(6), 321-343.

Saracevic, T. (2017). *The notion of relevance in Information Science: everybody knows what relevance is. But, what is it really?* Williston: Morgan & Claypool.

Saracevic, T. (1991). Information science: origin, evolution and relations. En International Conference on Conceptions of Library and Information Science: historical, empirical and theoretical perspectives, 1991, Finland. Proceedings... Helsink.

Sperber, D., & Wilson, D. (2005). Teoria da relevância. *Linguagem em (Dis)curso* 5, 221-268.

Swanson, D. R. (1986). Subjective versus objective relevance in bibliographic retrieval systems. *Library Quarterly*, *56*(4), 389-398.

C H A P T E R   9

DIGITAL CURATION IN INFORMATION SCIENCE: INFORMATION DESIGN STRATEGIES

NATALIA NAKANO
Universidade Estadual Paulista

MARIANA CANTISANI PADUA
Universidade Estadual Paulista

LAÍS ALPI LANDIM
Universidade Estadual Paulista

MARIA JOSÉ VICENTINI JORENTE
Universidade Estadual Paulista

ABSTRACT

The aim of this study is to present Information Design and User Experience Design as digital curation strategies for information preservation, access and sharing. The applied methodology is theoretical-exploratory, based on an excerpt from the Digital Curation cycle proposed by Higgins. The study highlights Information Design and User Experience Design strategies to improve information access and sharing available on digital information environments, which, in turn, favor its preservation. Information Design, once incorporated into the curation planning of digital environments, leads to the effectiveness of communication processes on digital environments by orchestrating material, informational, sensory, cognitive and humanistic aspects of the subjects who interact with the environment.

Keywords: Information and technology, Digital curation, Information Design.

RESUMEN

El objetivo de este estudio es presentar el Design de la Información y el Design de Experiencias como estrategias de curación digital para la preservación, el acceso y el intercambio de la información. La metodología empleada es teórico exploratoria, basada en un trecho del ciclo de Curación Digital propuesto por Higgins. El estudio resalta estrategias del Design de la Información y del Design de Experiencias para el perfeccionamiento del acceso y del intercambio de la información proporcionada en entornos informacionales digitales, que, por su vez, favorecen su preservación. El Design de la Información, una vez incorporado a la planificación de curación de entornos digitales, lleva a la eficacia de los procesos comunicacionales en entornos digitales al organizar aspectos materiales, informacionales, sensoriales, cognitivos y humanísticos de los sujetos que interactúan con el entorno.

Palabras clave: Información y tecnología, Curación digital, Design de la Información.

1 INTRODUCTION

Knowledge construction after the Technological Revolution has been shaped by a series of new factors that profoundly impacted information access, production, organization and sharing. The emergence and ubiquity of social media, mobile technologies and low-cost Internet access impose new challenges for different areas of knowledge, especially Information Science (IS).

IS, an area concerned with the processes through which information passes throughout its life cycle, was understood in the past as exclusive to studies in documentation, librarianship and archival science. With the increase in digital information volume observed from the post-World War II Technological Revolution, IS comes to incorporate inter and transdisciplinary studies as the object of information is not an exclusive concern of the area.

For Saracevic (1996, p. 42), IS addresses the human problems of effective knowledge communication in social context, fundamentally characterized as: interdisciplinary by nature and in constant aggregating movement; inexorably linked to information technology; and an active participant in the evolution of the information society, converging with other fields of research and application. Therefore, IS must also encompass as a social discipline associations related to information, as well as permeate physical, cognitive, contextual and social aspects of information.

One of IS's goals is to provide resources to improve information access and sharing to adequately satisfy information needs. In the same sense, according to Orna and Stevens (1991, p. 197), Information Design (ID) can be broadly understood as "[...] all the activities which go to making ideas visible, to showing their structure and the relations between them - so that others can use them and make their own". Such a way of thinking about information both in IS and ID means reflecting and finding solutions to the problems that emerge throughout information life cycle, to favor communication processes efficiency and effectiveness.

Capurro (1992) suggests in the article *What is Information Science for*? *A philosophical reflection* that the focus of IS studies, based on information technology studies, is closely related to the

possibilities that these technologies have in relation to the subjects' bodily capabilities, which does not imply evaluating only the ease of use (usability) and ergonomic design (structural issues) of information systems. Thus, Capurro (1992) highlights the observation by Orna and Stevens (1991), in which the authors describe a relationship/ alliance between IS and ID when considering all dimensions of human existence that, in addition to aesthetic and bodily issues, also include the individual's perception and behavior as a whole. ID emerges as a discipline that addresses design issues prior to structural problems by highlighting information organization in physical and digital spaces, by dealing with representation in a three-dimensional way, by producing meaning and understanding through language, signs, words and shapes; ID therefore seeks to address large volumes of information, especially on digital environments.

In the same scope of interdisciplinarity with IS, Digital Curation (DC) is a convergent discipline to the area that provides a holistic and systematized approach to the processes that permeate the digital information life cycle. For the Digital Curation Center (DCC) (2020), DC is a complex process that involves maintenance, preservation, appraisal, re-appraisal, use and reuse of digital information throughout its life cycle, as this process reduces threats to its long-term preservation and reduces the risks caused by technological obsolescence.

Although the DCC adopts the terms use and reuse as the model focuses on data stored on digital repositories, in this study we have adopted the terms access and sharing to refer to the same phase of the Digital Curation life cycle. This is because the focus is on digital informational environments, from a post-custodial perspective of Information Science.

The post-custodial paradigm represents a transition from the previous paradigm, the custodial, characterized by a technicist, historicist and patrimonial behavior, focusing on the custody of documents rather than facilitating their access and sharing. On the other hand, the post-custodial paradigm presupposes the search for mediations between institutions and societies that strive for the active participation of subjects who, in a network, also play the role of mediators, from the creation and sharing of information resources and the content construction (Lemos, Jorente, & Nakano, 2014). In this

post-custodial context, individuals and communities that interact with information environments go beyond the role of mere information users when they produce and share content. Thus, using a more adequate nomenclature to their active role in the processes of information interaction is demanded.

In this sense, ID and Experience Design present themselves as contributing elements to the DC life cycle. The DC systematization is applicable to the management of digital information on Web environments, while ID knowledge supports, especially, the DC access and sharing phases.

The life cycle model proposed by the DCC presents digital curation actions applicable to different contexts. Illustrated by Higgins (2008) and adopted by the DCC (Figure 1), this model involves continuous and iterative processes that range from digital object conceptualization to metadata designation, digital object appraisal for decision on preservation or disposal, the transformation (migration to avoid obsolescence) access, sharing and re-appraisal.

Figure 1 presents the processes and agents that make up the Digital Curatorship life cycle.

Figure 1: Digital curation life cycle proposed by Higgins (2008)
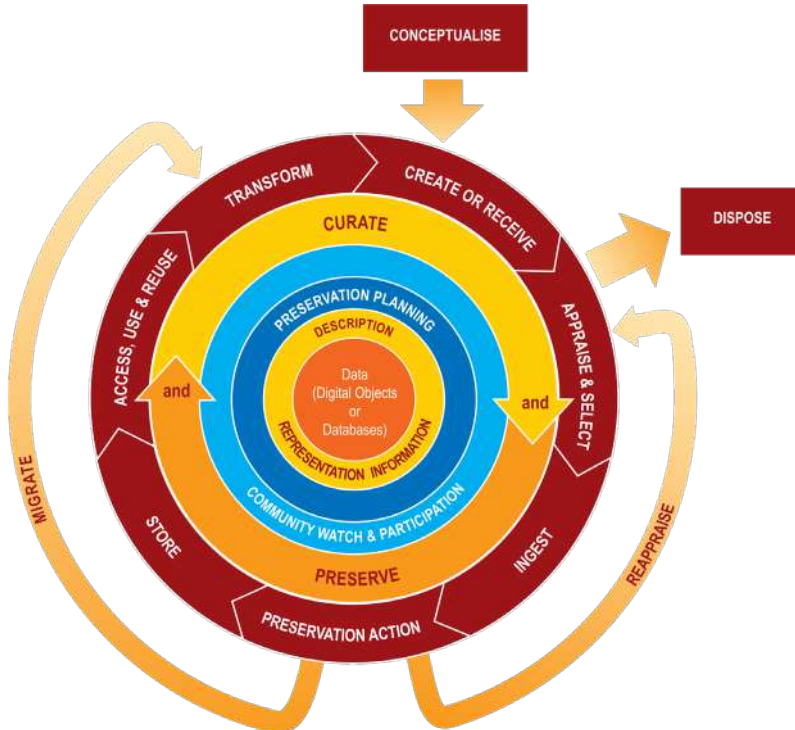
Source: Higgins (2008).

      The presented model systematizes the curation actions that may or may not be applied in their entirety in digital object curation on information systems. The application of the actions in the model, however, involves the work of a multidisciplinary team as different expertise is required in the different stages that constitute it.

      In the analysis of the model proposed by the DCC, there is a need for two interdisciplinary teams involved in the process. A team focused on the core of curation, highlighted in orange and blue, that is, information description and representation, in addition to the data and metadata definition in the organization, preservation and planning systems. At this stage, the contribution of knowledge produced within the scope of archival science and library science is relevant.

The second team is directed to the preservation steps (ingest, preserve and store) and curation (access, use, reuse, transform, create and receive, appraise and select). Although the literature on Digital Curation in Brazil is focused on preservation issues (Sayão, 2010; Sayão & Sales, 2012, 2013; Grácio, 2012, 2013; Grácio & Arellano, 2020), this study proposes a greater emphasis on the stages of information access and sharing as the frequency of occurrence of these phenomena consequently implies a demand for improving their preservation.

In this context, the purpose of this study is to demonstrate the relevance of the resources offered by Information Design and Experience Design for optimizing the access and sharing phases (named use and reuse by the DCC) of the Digital Curation lifecycle model represented in red in Figure 1.

2 INFORMATION DESIGN AND EXPERIENCE DESIGN: Strategies for information access and sharing for digital environment curation

Design and especially Information Design (ID) play a relevant role for developing projects and actions addressing the challenges related to the availability, knowledge and information access and sharing objectified in physical, digital and hybrid environments.

According to the Brazilian Society for Information Design (SBDI, 2020), ID - area that brings together researchers, teachers and professionals working in analog and digital Information and Communication Systems - copes with information management and production focusing on optimizing management processes, interaction and appropriation of visual information.

In general terms, the theoretical foundations of ID are simultaneously based on the various disciplines from which information systems technology practices are derived - Information Science, Computer Science, Design, Cognitive Science, ICTs and intelligent systems. The concept of ID, used to describe this new idea, reflects its multiple origins, diverse motivations and novelty.

For Frascara (2016), ID enables and optimizes information access in a simplified and appropriate way to the content the netizen

is looking for, which makes interaction with information reliable, complete, concise, relevant and quickly understandable. For the author, proper ID planning minimizes problems and solves issues to reduce fatigue (cognitive overload), minimize errors in information processing, accelerate the achievement of goals in carrying out a task and make the information suitable for the context in which it is presented.

When dealing with issues of content, human and technical factors, the focus is in the potential of languages on the environments designed through ICTs and also in issues of information system interoperability and convergence. Interoperability allows multiple systems, identical or radically different, to communicate seamlessly. To take advantage of interoperability between properly connected systems, skills are needed to interpret the complexity of the information derived from each system, a matter for specialists who, in multidisciplinary teams, deal directly with: Design structures; metadata; computer-specific programming languages, among other convergences.

This implies the need to equate cognitive capacities in the communication process as a whole. In ID, the priority is to find the most appropriate structure for the type of presented information. Therefore, one must have a broader focus, which encompasses not only graphics, texts and illustrations, or merely aesthetic issues, but also the goals of the subjects that interact with the system, with the content of the communicated message and with all the actors (human or not) of the communication process; and the objectives of performing the task, to make the interaction with the digital object and with the interface satisfactory.

ID also addresses the design of clear and understandable communications, by supporting the treatment of the structure, context and presentation of data and information (Portugal, 2020). For Carliner (2000), ID is the preparation of communication products so that they achieve performance objectives previously established in the project requirements. According to the author (Carliner, 2000, p. 4) the ID process involves:

> 1. Analyzing communication problems; 2. Establishing performance objectives that, when achieved, address and those problems; 3. Developing a blueprint for a communication effort to achieve those objectives;

4. Developing the components of the planned communication effort solution; 5. Evaluating the ultimate effectiveness of the effort.

In this definition, the performance objectives (item 2) are observable and measurable tasks that individuals must be able to perform, the conditions to perform these tasks and the acceptable level of work in their accomplishment (Mager, 1997); the plan (item 3), in turn, deals with the organization of the environment project, which indicates the content to be presented, the extension and format of its presentation (Kostur, 1999).

Design, understood as a large area encompasses several specialized disciplines, such as Interface Design, Infographics, Visual Communication, Information Visualization, Information Design and Experience Design. The focus of Design, convergent to all its disciplines and methodologies, is the human being; moreover, the disciplines are not just human-centered, they are human, that is, they are based on our ability to be intuitive, to recognize patterns, to construct ideas with emotional meaning, to express ourselves. In this sense, it is important to consider aspects beyond the purely rational and analytical of the problems, from the incorporation of emotional perspectives (Brown, 2009).

The emotions felt by the netizen while interacting with digital environments can be positive or negative, as the experiences these environments provide provoke emotions in the same proportion and intensity as the physical environments. They are pleasant, cozy and/or inviting, with feelings of well-being and positive as a result; or they are unpleasant, cold and repulsive, with feelings of discomfort and, consequently, reduced time spent in the environment, that is, a negative experience. This assessment process, these feelings and emotions, are prior to consciousness and rationalization.

Thus, emotions bring an inherent assessment: positive or negative, essential to determine future actions. For example, if the emotions or experiences felt in a digital environment were positive, the individual will probably stay longer in the environment and will return to that site when he/she needs information there; however, if the emotions or experiences were negative, he/she is unlikely to return

to that environment. According to Hassenzahl (2010), experiences are closely linked to actions:

> An experience is an episode, a chunk of time that I went through and I am going to remember. It was sights and sounds, feelings and thoughts, motives and actions, all closely knitted together and stored in memory, labeled, relived and communicated to others. Experiencing is the stream of feelings and thoughts we have while being conscious – a continuous commentary on the current state of affairs. (p. 8).

Also according to Hassenzahl (2013), in the West, our actions have been transformed due to our experiences. We experience a shift from the material to the experimental. The author mentions studies that conclude greater satisfaction with valuing situations that provide experiences; therefore, people prefer to invest their money in concerts, plays and trips than in acquiring material objects of similar value, such as clothes or jewelry. On the other hand, artifacts, things, are not opposed to experiences: for example, traveling presupposes means of transport; a musical show presupposes instruments and a place – these technological artifacts, in turn, shape, mediate and guarantee a good experience. From this new behavior recognized by the designers, the User Experience (UX) discipline stands out, whose central objective is the creation of interactive (digital or physical) products or services that function as creators, facilitators or mediators of the experience. Currently, the User Experience (UX) discipline is based on the literature in the area, however, in this study, we use the term Experience Design as a synonym for UX as a way of maintaining consistency in the choice of terms. In the same line, we prefer access and sharing over use and reuse; netizen instead of user; create rather than develop. These products (or digital environments, in the case of our study) shape the way people feel, think, act and, inevitably, influence the experience positively or negatively (Hassenzahl, 2010). A good experience on a digital environment cannot be guaranteed, but the application of Information Design and Experience Design strategies and principles offer the support for creating a positive experience.

Hassenzahl (2010) developed a three-level conceptual model with the objective of guiding Experience Design through an interaction

object: the levels of *Why*?, *What*?, and *How*? When the designer wonders why? of a product or service, the answer will guide the following levels (What? and How?). The answer must include people's real motives, needs and emotions. The designer must try to discover the needs and emotions involved in the activity, the meaning, the experience. The What? level understands the features of the product, for example, making a call or listening to music. And the How? understands how these functions will be performed through the object and its context of use, for example, navigated menus, clicked buttons, etc., that is, the way appropriate way of putting the functionality to work.

The How? is the environment where the designer is especially involved. He must ensure that the functionality (What?) will occur in an aesthetically pleasing way. The action of making a call (What?), for example, requires the following actions: choosing the person to call, making and ending the call. How this call will be made includes the cell phone and the specific interaction mode previously defined by the designer. These two levels are the ones typically considered by product designers.

However, according to Hassenzahl (2010), the most important level that should guide the way the interaction will take place is the level of *why*? We must imagine the real reason for the call: finding out about the health of a loved one, a way to pass the time, ordering a pizza, a good night wish for separated lovers, etc. So, Experience Design should start with *why*? to clarify the needs and emotions surrounding an activity, the experience. Only then will the functionality be able to provide the experience (what?) and the appropriate way to put the functionality into action (how?). The harmony between the three levels will result in products that are sensitive to the peculiarities of the human experience. This design model proposed by Hassenzahl (2010) aims to create products, in this case digital environments, that consider the peculiarities of human experience.

Therefore, to design experiences that involve interactions in digital informational environments, one must consider the occurrence of complex events. Figure 2 illustrates the elements of Experience Design in their complexity.

Figure 2: Elements of Experience Design
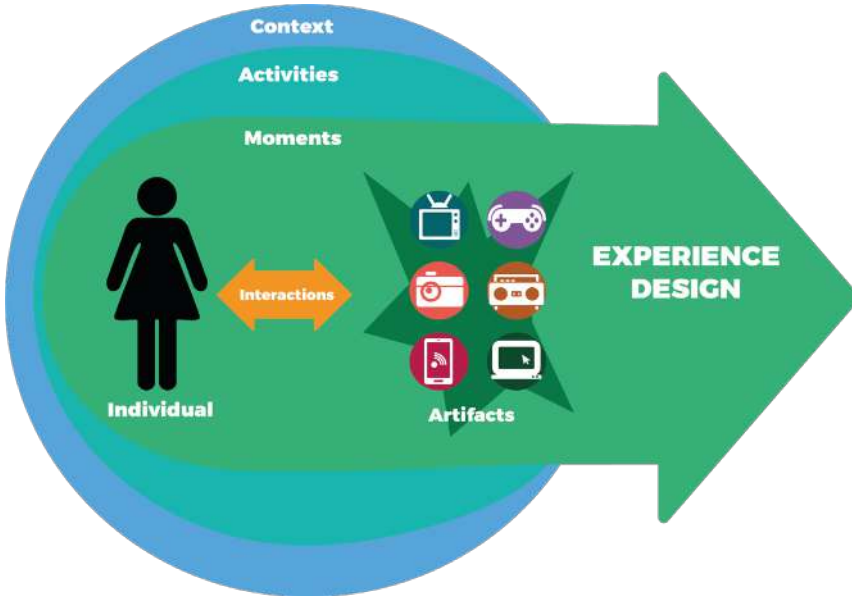
Source: Padua (2014).

Figure 2 illustrates the elements that should be considered when creating an experience. The first element to be considered is the context in which the interaction takes place (How?). The activities, in turn, should be thought of as the tasks that the netizen will perform in the interaction (What?). The moment configures the instant in which the interaction takes place (When?). At the center of these elements, we have the netizen (Why?), and the interactions (Why? What? When? and How?) that mediate the experience with the artifacts.

In this context, Experience Design corresponds to the consideration of an individual's satisfaction at the time of interaction with a particular product, service or system. Therefore, understanding each of the elements and the context that make up the netizen's experiences, making it possible to produce the desired results is fundamental.

3 CONSIDERATIONS

Considering the Digital Curation life cycle, Information Design and the principles and strategies of Experience Design applied to the access and sharing phase of an information system, stakeholders must be the center of the creation processes of a digital environment. Furthermore, improving access and sharing based on such principles and strategies favor information preservation on digital environments.

This study considers that information preservation initiatives are significant, shape the stakeholders and are shaped by it when information retrieval is a reality on digital environments, that is, when netizens/visitors who interact with environments have a positive experience at the time of interaction, and therefore knowledge construction is facilitated by the environment.

In the access and sharing stages (or use and reuse), netizens recognize a gap in their knowledge, that is, an informational need is identified. The subject then decides on an artifact to mediate the information search, and, at the time of the information search, interaction takes place on the digital environment. The environment must comprehend the principles of ID and Experience Design so that information retrieval occurs without causing unnecessary cognitive load and the netizen/visitor is positively impacted by the environment design and remains on it, and also decides to return in the future. In the experience created by information professionals in a satisfactory and positive way, knowledge construction can be facilitated.

To make communication on digital environment interfaces transparent, that is, in such a way it does not cause cognitive overload on the visitor, ID resources (planned in the Digital Curation) must orchestrate the material, informational aspects of the digital environment, as well as the sensorial, cognitive and humanistic aspects of the subjects that interact with the environment, considering that the improvement of digital environment effectiveness is not merely technical, resolved solely by one area. Professionals in the field of IS and ID should work together so that the environments are meaningful to stakeholders for which they were intended.

Once ID and Experience Design are incorporated into the digital environment curation planning, the system is expected to

favor convergences to reach spheres of culture and the daily lives of individuals, becoming transparent and universal to society.

REFERENCES

Brown, T. (2009). *Change by design: how design thinking transforms organizations and inspires innovation*. New York: Harper Collins.

Capurro, R. (1992). What is information science for? In Vakkari P., & Cronin, B. (Ed.), *Conceptions of Library and Information Science: Historical, empirical and theoretical perspectives* (pp. 82-98). London: Taylor Graham.

Carliner, S. (2000). Physical, cognitive, and affective: A three-part framework for information design. *Technical communication*, *47*(4), 561-576.

Digital Curation Center (DCC). (2020). *What is digital curation?.* (Artículo). http://www.dcc.ac.uk/digital-curation/what-digital-curation.

Frascara, J. (2016). Data, information, design, and traffic injuries. En Oven, P. Č., & Požar, C. (Ed.)*, On Information Design* (pp. 53-72). Ljubljana: The Museum of Architecture and Design.

Gracio, J. C. A. (2012). *Preservação digital na gestão da informação: um modelo processual para as instituições de ensino superior*. São Paulo, SP: Cultura Acadêmica.

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 (Online), 18*, 111-129.

Grácio, C. A., & Arellano, M. Á. M. (2020). A gestão da preservação digital de dados de pesquisa: proposta de um modelo processual. *Revista Brasileira de Preservação Digital*, 1.

Hassenzahl, M. (2010). Experience design: technology for all the right reasons. En Carroll, J. M. (Ed.), *Synthesis lectures on human-centered informatics*. San Rafael, CA: Morgan and Claypool Publishers.

Hassenzahl, M. (2013). User Experience and Experience Design. En *The Encyclopedia of Human-Computer Interaction* (2 ed.). Denmark: Interaction Design Foundation.

Higgins, S. (2008). The DDC curation lifecycle model. *The International Journal of Digital Curation, 3*(1).

Kostur, P. (1999). Developing single source documentation. In *IPCC 99: Communication Jazz: Improvising the New International Communication Culture. Proceedings 1999 IEEE International Professional Communication Conference* (pp. 383-389). New Orleans, LA: IEEE.

Lemos, J. G., Nakano, N., & Jorente, M. J. V. (2014). O paradigma pós custodial e sua representação no design da informação no sítio do arquivo nacional do Reino Unido. *Liinc em Revista*, 10(2).

Mager, R. F. (1997). *Preparing instructional objectives: a critical tool in the development of effective instruction*. Atlanta, GA: The Center for effective performance.

Orna, E., & Stevens, G. (1991). Information design and information science: a new alliance? *Journal of Information Science*, 17(4).

Padua, M. C. (2014). *Arquitetura da informação pervasiva e experiência do usuário: avaliando os ambientes informacionais do PROINE.* (Disertación de Máster). https://repositorio.ufpb.br/jspui/handle/tede/3968?locale=pt_BR.

Portugal, C. (2020). Linguagem contemporânea: teorias e práticas. *DAT Journal*, *5*(2).

Saracevic, T. (1996). Ciência da Informação: origem, evolução e relações. *Perspectivas em Ciência da Informação*, *1*(1).

Sayão, L. F. (2010). Uma outra face dos metadados: informações para a gestão da preservação digital. *Encontros Bibli, 15*(30).

Sayão, L. F., & Sales, L. F. (2012). Curadoria Digital: um novo patamar para preservação de dados digitais de pesquisa. *Informação & Sociedade*, *22*(3), 179-191.

Sayão, L. F., & Sales, L. F. Dados de pesquisa: contribuição para o estabelecimento de um modelo de curadoria de dados para o país. *Tendências da Pesquisa Brasileira em Ciência da Informação*, *6*(1).

C H A P T E R   1 0

FACETS OF DIGITAL CURATION IN THE POST-CUSTODIAL PARADIGM: COLLECTIVE AND SOCIAL CURATION

LUCINÉIA DA SILVA BATISTA
Universidade Estadual Paulista

MARIA JOSÉ VICENTINI JORENTE
Universidade Estadual Paulista

ABSTRACT

Post-custodial paradigm proposes, to libraries, archives, and museums, a Digital Curation of heterogeneous social narratives, of polysemic voices in the contemporary society. However, the existing curation process is not clear in relation to the participation of stakeholders in curation actions. In this sense, we question whether the Digital Curation Model presented by Higgins (2008) meets the post-custodial need of postmodern society and whether other facets are possible in Digital Curation to favor the opening of museum institutions to stakeholders, turning them into producers of cultural content to be cured. For that, the actions and processes present in the Digital Curation Model by Higgins (2008) are presented, and other possibilities of curation that include the stakeholders in the curatorial processes are explored, in a participative way, in the construction of a collective and crosscultural narrative.

Keywords: Digital Curation, post-custodial paradigm, collective and social curation,cross-cultural narrative, museum.

RESUMEN

En la sociedad contemporánea la poscustodialidad propone a las bibliotecas, archivos y museos una Curación Digital de narrativas sociales heterogéneas y de voces polisémicas. Sin embargo, el proceso curatorial existente no es claro en lo que respecta a la participación de los sujetos y de las comunidades de interés en las acciones de curación. En ese sentido, reflexionamos sobre si el Modelo de Curación Digital presentado por Higgins (2008) satisface la necesidad poscustodial de la sociedad postmoderna y proponemos que existan otras facetas de la Curación Digital que propicien la apertura de las instituciones museológicas a los sujetos y a las comunidades de interés y los conviertan en productores de contenidos culturales que puedan ser curados. Para ello, se presentan las acciones y procesos del Modelo de Curación Digital de Higgins (2008) y se exploran las posibilidades de Curaciones Colectiva y Social que incluyen a las comunidades de interés en los procesos curatoriales, de forma participativa, en la construcción de una narrativa transcultural.

Palabras clave: Curacíon Digital, poscustodialidad, Curaciones Coletiva y Social, narrativa transcultural, museo.

1 INTRODUCTION

Libraries, archives and museums, responsible for preserving humanity's cultural heritage, become complex environments as they reflect contemporary society. In this context, Museology has sought to overcome, in its theoretical field, the limits of the custodial, technicist and Cartesian paradigm, by developing post-custodial theories and practices that consider such complexity in their institutions. Thus, they propose/design new models of services, products and actions that feed both the dynamism of the theoretical field and the practices of the area.

Museums guard collections composed of goods, tangible and intangible, considered to be the humanity's cultural heritage. They are two-dimensional or three-dimensional objects that represent "[...] a period, a know-how, a creative process of the human being in a given context" (SISEM, 2010, p. 31). They become primary informational sources for evidencing or witnessing the environment in which a social group inhabits.

As research sources, objects carry information that allows knowing the meanings of cultural manifestations, scientific, technological and historical practices and the motivational principles of their creation, as well as justifying their preservation for society and for posterity (SISEM, 2010). This information is systematized through museum documentation, which involves activities of searching, gathering, organizing, preserving and making information available on museum objects, the fundamentals for cataloging and the documental processes of legal-administrative control.

Museum Documentation helps to guide conservation and preservation practices, management and monitoring of collections, curating exhibitions and carrying out educational activities (SISEM, 2010). In that regard, museums show a very strong systemic relationship with their collections' documentation, which is essential for almost all museum actions.

Hernández Hernández (2016, p. 86) considers documentation "[...] one of the museum's most important functions, to the point where the museum is viewed as a true documentation centre where information on cultural heritage is gathered, managed and

disseminated". For the author, museum documentation is "[...] a set of very diverse documents in terms of supports, contents, origins and cultural value" (Hernández Hernández, 2016, p. 86).

In contemporary times, the concept of museum goes beyond the idea of keeping museum objects; it consists of "[...] a complex, living and dynamic system, open to society for culture dissemination and for heritage investigation, protection, conservation and defense" (Ceballos, 2006, p. 102, our translation). Museology turns to the community to represent it in its different contexts and in its numerous cultural manifestations.

The opening of the museum to society is also evidenced by Hernández Hernández (2016). The author, while understanding the museum as a curator of collective memory (tangible and intangible assets) – to be considered as a source of information for the community –, presents it as "[...] the place where society participates the recreation of that memory" (Hernández Hernández, 2016, p. 86). Cultural heritage, in this conception, becomes an informational input for new memory creations – different points of view, perspectives and narratives of the same story. They are official memories built by a minority or by a dominant class, that is, a hegemonic narrative preserved in libraries, archives and museums.

In addition to the museum documentation, the actions of the museums contemplate the exhibition preservation and curation. The preservation of collections is part of the principles of museums (ICOM, 2009), which means "[...] to protect, defend, safeguard the cultural assets from any damage or future danger to ensure its availability continuous availability" (SISEM, 2010, p. 85, our translation).

Object deterioration may occur due to numerous factors, such as environmental ones (light, temperature, humidity and atmospheric gases), ongoing ones (inappropriate handling, storage or exposure), and biological ones (micro-organisms and insects). Interventions for object conservation are divided into preventive or corrective. Preventive intervention focuses on indirect interventions on the object, that is, adequate and favorable actions to slow down the museum object decay (control of environmental conditions, adequate cleaning and storage, correct handling, lending and exhibition procedures, among others). Corrective interventions focus on the recovery of the deteriorated

object, which, as direct interventions, follow guidelines established by the International Council of Museums (ICOM) (SISEM, 2010).

For exhibition curation, planning needs to include research, objective, target audience, date, financial resources, collection, narrative, visual identity, among other elements that must consider and include activities carried out before, during and after the exhibition (IBRAM, 2017). The concerns traditional on-site museums are based on three fundamental actions: museum documentation, preservation and exhibition. They are part of the curation in museums, guided by policies, guidelines and plans developed by these institutions. In these institutional actions, the community has only acted as information consumer.

However, Information and Communication Technologies (ICTs) have led to a new reality in museum contexts. Digital virtuality breaks the boundaries of museums through the use of digital environments, including repositories and social media, which expand and enhance information access and sharing and cultural heritage held in museum institutions.

In addition to objects on physical supports, digital objects that need curation emerge in digital-virtuality, which turns museums into hybrid environments, composed of collections of both types. On the other hand, despite the expansion of information access and its sharing provided by ICTs, digital objects have become vulnerable due to technological obsolescence. In this sense, museums turned their concerns to their collections' management and digital preservation. By highlighting the plurality of voices in society and their transformation into transcultural museum institutions, post-custodial paradigm proposed the deconstruction of homogeneous narratives and an opening for the curation of heterogeneous social narratives to these institutions. Information scalability in these environments made Collective and Social Curation mandatory, in addition to Digital Curation, as it comprises the curation of unofficial narratives of marginalized communities present in contemporary society.

In view of the post-custodial reality, the following question is presented: does the Digital Curation Model proposed by Sarah Higgins (2008), and adopted by the DCC, meet the post-custodial need of contemporary social reality? Are there other facets of Digital

Curation that allow museums to open up to stakeholders and make them producers of cultural content to be curated?

To answer to these questions, we present the DC process proposed in the Higgins model (2008) and explore other curatorial possibilities that include the participation of stakeholders in the curation process (planning and implementation of curation actions), in the construction and reconstruction of narratives, through information, knowledge and culture access and sharing on social platforms and on information representation and digital preservation systems.

2 DIGITAL CURATION

ICTs have introduced new digital formats, new devices and information production methods, which have modified curation processes and required new management and preservation methodologies in the digital environment from museum institutions. In this context, Digital Curation (DC) manifests itself as an interdisciplinary concept and inter-institutional practices that require "[...] knowledge of applicable technologies that were not included in predigital curation practices and involves a lifecycle" (Sabharwal, 2015, p. 14).

In 2004, a distributed collaborative service center named the Digital Curation Center (DCC) was created, aimed at discussing political, technological and practical problems of digital curation and preservation processes and the need to understand the curation process (Higgins, 2011). DCC succinctly defines DC as "[...] the long-term management and preservation of digital data/information". In addition to the DCC, Beagrie (2004) presented implicit elements and presupposed an opening of the curation to new value adding, which can be configured in productions of polysemic narratives of the cultural heritage existing in society: particularities still neglected in postmodernity and in principles of collective and social curation of data and memories representing stakeholders.

The curation actions comprise curation, preservation and management activities, which Lord and Mcdonald differentiates as curation, archiving and preservation:

> Curation: The activity of, managing and promoting the

use of data from its point of creation, to ensure it is fit for a contemporary purpose, and available for discovery and re-use. For dynamic datasets this may mean continuous enrichment or updating to keep it fit for purpose. High levels of curation will also involve maintaining links with annotation and with other published materials.

Archiving: A curation activity which ensures that data is properly selected, stored, can be accessed and that its logical and physical integrity is maintained overtime, including security and authenticity.

Preservation: An activity within archiving in which specific items of data are maintained over time so that they can still be accessed and understood through changes in technology. (Lord & Mcdonald, 2003, p. 12).

The authors highlight that, despite the difference, the three activities – curation, archiving and preservation – are related, "[...] preservation is an aspect of archiving, and archiving is an activity needed for curation" (Lord & Mcdonald, 2003, p. 12), thus curation is dependent on archiving and preservation.

The DCC adhered to the DC Life Cycle model presented by Higgins in 2008. For the author, actions can "[...] ensure the maintenance of authenticity, reliability, integrity and usability of digital material" (Higgins, 2008, p. 135). The model (Figure 1) provides an overview of the steps for proper curation, as it identifies curation actions within the digital object lifecycle sequentially (Higgins, 2008).

Figure 1: Digital Curation Lifecycle Model
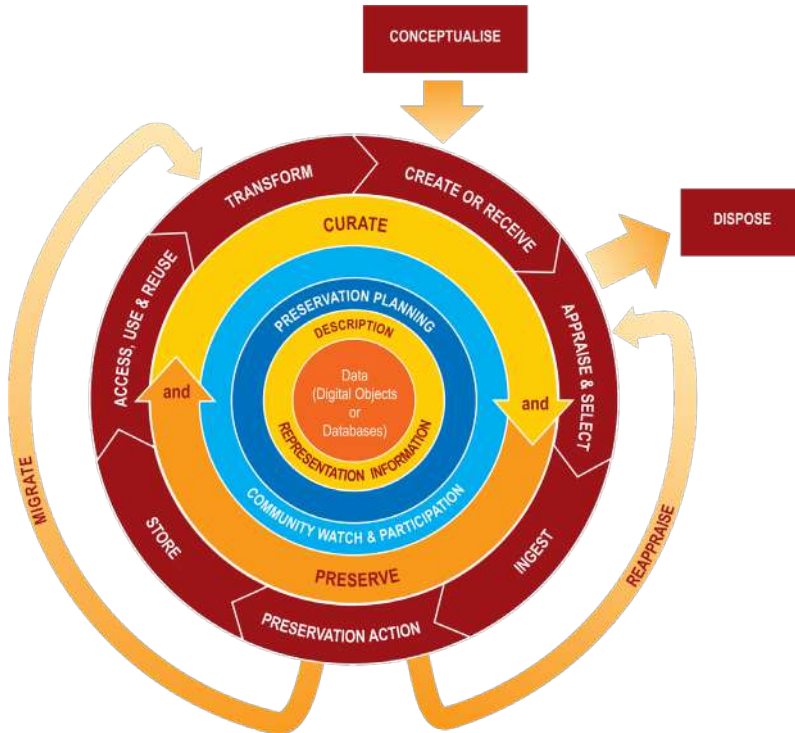
Source: Higgins (2008).

The model is divided into two actions thought and worked on in the conceptualization: macro actions - aimed at curation planning and structuring - divided into information description and representation, preservation planning, community watch and participation, and curation and preservation, represented in the gradient of colors between yellow and orange; and micro actions – aimed at the implementation and practices involved in the process – composed of creating and receiving, appraising and selecting, ingesting, preserving, storing, accessing, using and re-using, and transforming, represented in the model in red. Occasional actions are also present – reappraising and migrating, represented in the model by the external vectors in orange.

Conceptualization is a phase before the production of the

digital object and it is when the conception and planning of the digital object creation, and the capture methods and storage options are decided (Higgins, 2008).

Sabharwal (2015) mentioned the possibility of the participation of community representatives together with the institution's specialized staff in planning and curation. However, by making this participation optional and limited, the collective contribution in the curation processes is devalued. In conceptualization, issues related to copyright (which imply the restriction of access to collections) are also considered to the development of collections (established according to the museum's profile and its collection, exerting an influence on the collection appraisal), the capture methods, metadata and collection classification schemes (different according to the museum's profile), and the use of social tags (open classification on social networks that do not comprise standard classifications) (Sabharwal, 2015). These points should be discussed and considered in planning for the implementation of the DC process and that vary according to the institution.

According to Sabharwal (2015), metadata development and management are established by curators and catalogers before recording the items – structured in a spreadsheet that will be used to record the items. The preservation plan must be "[...] throughout the curation lifecycle of digital material. This would include plans for management and administration of all curation lifecycle actions" (Higgins, 2008, p. 137).

For Higgins (2008, p. 137), the **community watch and participation** should "[...] maintain appropriate community activities, and participate in the development of shared standards, tools and suitable software".

For curation and management, "[...] the curator has to be aware and carry out the management and administration of the actions planned for the promotion of curation" (Higgins, 2008, p. 137), which are sequential, starting with the creation and reception of data.

The **create and receive** action refers to the creation of data and metadata – administrative, descriptive, structural, technical and, optionally, preservation (Higgins, 2008). Data creation can be the record of historical or cultural events – considered intangible heritage

in museums – such as oral histories (eyewitnesses with a critical account of events in the first person)[1] or institutional events. According to Sabharwal (2015, p. 104), "Curators will create administrative descriptive, structural, technical, and preservation metadata that documents the creation, provenance, and other important data pertaining to its lifecycle."

In the digital environment, new dimensions have expanded the use of metadata, making them essential in information representation, in facilitating access, in the exchange between systems, in technical and semantic interoperability. Metadata is presented as a solution to the problem of preservation from the "[...] identification of a set of data and information, expressed in the form of metadata that anchor the digital preservation management processes" (Sayão, 2010, p. 3, our translation).

It is noteworthy that the DC can be performed according to the use of software designed from schemes, norms and standards of metadata established by international entities and councils. Some free software, such as Archivematica, Dspace, AtoM and RODA, which include administrative, descriptive, structural, technical and preservation metadata. Such systems facilitate the work of curators, who must turn their attention to choosing the right software to meet the institution's needs.

As for the action **receive** from donor collections, it is the history of ownership and transfers of the collection throughout its lifecycle, and this information is recorded in the field provenance of the technical metadata – the reliability of the collection and the repository depends on the integrity of these data (SABHARWAL, 2015). The data receipt must follow collection policies and the allocation of appropriate metadata (Higgins, 2008).

The action **appraise** helps to define the collection values among which, in the museum context, are confirmative, informative, historical and cultural. The action **select** must reflect the institution's policies and legal regulations in choosing the content to be curated and preserved.

---

1   Example: Museu da Pessoa is a virtual museum responsible for recording life stories. Available at: https://museudapessoa.org/about-the-museum/. Access on: 24 Sep. 2020.

The action **ingest** is the data transfer to a file, repository, data center or other custody (Higgins, 2008, p. 138). This phase involves legal, intellectual and technical aspects. "Laws govern the transfer of intellectual property and the protection of privacy, and no popular demand or other interests may supersede these laws" (Sabharwal, 2015, p. 105), which affect collections' open information availability.

The technical aspects require professionals to understand the system, its design and operation, which implies facilitating the data ingestion, whether through its sets, digital objects or descriptive metadata (Sabharwal, 2015) – the ingestion form differs from one software to another. In addition to skills in the area of information and curation, the information professional needs technological knowledge to understand the design, processes, workflow and functioning of repositories so that they are used properly and efficiently.

The **preservation action** undertakes "[...] actions to ensure long-term preservation and retention of the authoritative nature of data. Preservation actions should ensure that data remains authentic, reliable and usable while maintaining its integrity" (Higgins, 2008, p. 138). Systems based on the OAIS model and other international standards aimed at managing and preserving information should ensure these elements to digital objects.

In the archival context, these are trusted digital repositories for digital archive records. According to Conarq (2015, p. 9, our translation), "A trusted digital repository is a digital repository capable of maintaining digital materials authentic, preserving them and providing access to them for as long as necessary".

In this sense, Lampert (2016) recommends Archivematica for the digital object preservation: "[...] Archivematica's main feature is digital preservation, based on strategies of emulation, migration and standardization, and stands out for the generation of information packages for admission, access and archiving according to the OAIS model. (Lampert, 2016, p. 152, our translation).

Higgins (2008, p. 135) mentions that the OAIS Model is for system building:

> Workflow design, management issues, identification of processes and use of best practices can all be

enhanced through application of standards such as OAIS (International Organization for Standardization [ISO], 2003) and ISO 15489 (ISO, 2001, n.p.).

Using the model facilitates data exchange and interoperability between systems. For information access, Archivematica needs to converge with other interoperable systems, such as AtoM (both free and developed by Artefactual System), free and open-source software (meaning that they are constantly updated and that can guarantee the preservation in the long term).

The action **store** converges formats to keep the digital object secure and this depends on the institution's technology and financial resources. Short-term storage methods generally include a computer's hard drive, other devices (flash drives), and network drives on the intranet. However, in the long term, the use of specific hard drives, network drives and cloud storage will be common, but they are not equivalent to preservation despite periodic security backups (Sabharwal, 2015).

Repositories for curation can be commercial or open source – with their storage capacity –, "In both cases, the storage may be physical, virtual, or cloud based, which raises questions about the quality of the storage media, integrity of files and directories, and the frequency of backups" (Sabharwal, 2015, p. 107).

The actions **access, use and reuse** are the "Ensure that data is accessible to both designated users and reusers on a day-to-day basis." (Higgins, 2008, p. 138). For the author, robust access control and authentication procedure in access systems are also possible. Despite the curated information, there is no guarantee for their access to all stakeholders.

The action **transform** refers to the creation of new data from the original object, "[...] for example: by migrating into a different format; by creating a subset, by selecting or query to create newly derived results, perhaps for publication" (Higgins, 2008, p. 138). Transformations of data, databases, files and directory structures are performed by the curator when the technology used to create the content is no longer accessible. This change also happens with metadata, as "[...] metadata interoperability standards, Open Archives Initiative Protocol for Metadata

Harvesting, and best practices change with time" (Sabharwal, 2015, p. 107).

The action **re-appraise**, according to Higgins (2008, p. 138) comprises the "Return data which fails validation procedures for further appraisal and reselection". Disposal, although a rare action in cultural heritage, may occur, and consists of the permanent removal of the collection for destruction or transfer to other custodian institutions (Sabharwal, 2015).

The action **migrate** implies transferring collections to a new repository, and migrating the data to different formats, transforming the metadata record and reorganizing the collection to suit the system design (Sabharwal, 2015). This is due to the fact that each system has its own structure and design. It is noteworthy that in free and open-source software, even though the system is the same, when migrating to a more updated version changes and information losses may occur in the data export process.

When describing the process of DC actions, it is observed that DC Lifecycle is a broad model aimed at data management and digital preservation. As for the community watch and participation, it is an alternative and must be decided by the institution, however, details are not clear in the proposed model.

In **community watch and participation**, information professionals watch is reduced to the needs of the community, which can result in the creation of services and products that meet the identified needs. However, postmodernity understands that stakeholders are producers of information and culture. Therefore, library, archive and museum institutions must disrupt the hegemonic discourse present in their collections and, for that, start from polyvocal narratives. Such narratives construct and reconstruct the cultural values of digital objects and evidence the multiple collective voices.

On digital environments, other facets are necessary for effective information communication in a time when stakeholders and individuals need to feel represented by institutions and cultural facilities. Converged with the DC, they bring about Collective and Social Curation, which includes social and community participation in the curation processes.

3 COLLECTIVE AND SOCIAL CURATION

The Digital Curation Lifecycle model considers stakeholders and informational subjects as users, reducing them to information consumers, devoid of memories, ideas and new knowledge that can be shared and preserved.

The concept of user is a term used in the custodial and technicist paradigm, which, despite widely used in contemporary society, does not fit the post-custodial paradigm nor the post-modern condition. According to Terry Cook:

> [...] postmodernism seeks to emphasize the diversity of human experience by recovering marginalized voices in the face of such hegemony and, hence its emphasis across a whole range of academic disciplines on issues of gender, race, class, sexuality and locality. (Cook, 2001, p. 17).

The advent of Information and Communication Technologies (ICTs) enabled museums to negotiate

> [...] different meanings and interpretations of the same knowledge, understanding that they can acquire new signifiers through non-specialized, but representative voices. (Cagigal, 2017, p. 28, our translation).

The emergence of Web 2.0 and social platforms transformed users into content producers, which allowed information production and sharing on these media. Such means enhance socialization of interpretations of cultural heritage and their narratives by stakeholders, activating other voices, generally not or well-articulated by established cultural institutions. (Meehan, 2020).

The neglected voices of the marginalized communities in modernity mentioned by Cook translate cultural heritage that represents and defines the very identity of these communities and that must be healed for current and future generations. Cultural heritage brings together facets of the creations of human beings at a given time and place in history that differ from one community to another and create heterogeneity in society.

Hernández Hernández (2019, p. 13, our translation) understands

cultural heritage as the set of assets "[...] tangible and intangible, ethnological, historical, artistic, archaeological, paleontological, scientific, songs, festivals, real estate, natural heritage and cultural landscapes", which have polysemic value as they cover different cultures and peoples. Added to this concept are beliefs, customs and intangible traditions (Welch & Ipinch Project, 2014).

These cultural heritages require collective and social curation in which communities collaborate and participate in the process. The first facet of Curation, Collective, is part of a curation in which stakeholders participate in decision-making processes, that is, in curation planning. The second, Social, the community participates in the implementation processes of cultural heritage curation actions, whether in the creation of content, in helping to describe and attribute value to cultural objects and in the transcription of manuscripts, for which they use the Crowdsourcing[2] method.

Sabharwal introduces Social Curation for museum environments, understanding community feedback through social media platforms with the aim of "[...] adding meaning to the collections and enriching public discourse on collections or exhibition themes" (Sabharwal, 2015, p. 10).

Collective Curation has three types of approaches, which define the intensity of stakeholder involvement in the curatorial process, which are: collaborative, participatory and empowering (Fetterman *et al.*, 2018). The collaborative approach consists of a consultation with the community – the institution seeks to obtain information from other stakeholders about their interests and knowledge before making decisions (Ingles, Musch, & Qwist-Hoffmann, 1999, p. 4) – although there is some kind of community participation, planning is top-down.

The participatory approach, in turn, enables institution members to share decision-making with the community (Ingles, Musch, & Qwist-Hoffmann, 1999). A horizontal plan of curation actions is observed, in which the decisions of the active individuals have the same weight as the decisions of the institutional members. It is a joint effort from start to finish.

In the empowerment approach, decision-making is controlled

2   Available at: https://themuseumofthefuture.com/2011/01/27/about-crowdsourcing-and-us/. Access on: 11 Sep. 2021.

by stakeholders as in community museums and ecomuseums, with the help of external professionals to maintain institutional characteristics and their responsibilities (Fetterman *et al.*, 2018).

According to Hernández Hernández (2019), museums need to strengthen shared leadership and make room for innovation and review projects and ideas from time to time, as all the people are part of museums and can contribute with their ideas and their creative capacity (Hernández Hernández, 2019, p. 40). In this way, museum institutions build a collective memory, bearer of social belonging.

From this perspective, it is necessary that "[...] the museum is willing to compromise in the construction of its narrative and is able to answer complex questions of who represents the community, what voice is maintained and how" (Cagigal, 2017, p. 28, our translation). For the author, museum versatility can provide a collective narrative, endowed with authenticity, legitimacy and value, focused on the needs of participating communities and on the processes of social cohesion between various sectors.

Uniting all these approximations and narratives that make up the plurality and vivacity of digital memory is a challenge for museums, and the protection of "[...] politically guided or interpretations that seek to appropriate symbols and objects distorting the facts" (Cagigal, 2017, p. 28, our translation), because every narrative has a political dimension.

Collective and Social Curation based on the access and sharing of memories, experiences, information and community knowledge, provides a diversity of narratives in museums that represent them and respect cultural diversity. This opening of museums and information professionals to the collective allows to reconcile with the past, sometimes correcting injustices by deconstructing existing narratives; sometimes building and recording new narratives for future generations.

It is noteworthy that community participation should take place at the time of construction of the software and systems that supports the Digital Curation. This is because these systems need to be developed respecting communities' cultural and social systems, establishing protocols and guidelines that define what can or cannot be accessed and shared.

Collective and Social Curation contribute to the construction of collective memory, which contextualizes and recontextualizes the values attributed to objects from the socialization of access and multivocal interpretations (Meehan, 2020), and highlight the intangible assets existing in contemporary society that must be preserved and shared for current and future generations. An opening for a collective resignification of its collections and a more fluid relationship with the community proposes a continuous process of critical interpretation (Cagigal, 2017, p. 26), in which libraries, archives and museums become mediators of the history, arbiter of narratives.

It is understood that ICTs provide libraries, archives and museums with a space for dialogue between stakeholders and digital museum objects and the opening to activate new voices by making existing narratives in the cultural heritage heterogeneous and representative.

4 CONSIDERATIONS

ICTs have brought about significant changes for museum collection curation; ICTs have provided the expansion of museum borders. DC is important for long-term access and preservation and, on the other hand, is a present and future reality in these institutions.

In this study, two facets necessary for the complexity of contemporaneity with regard to cultural facilities and information institutions were identified: the DC, in which community participation is limited, and the Collective and Social Curation.

Regarding the DC Life cycle model, it was found that its focus is on digital management and preservation and it restricts community participation in the curation process, limiting the community to mere information consumers. This gap is reflected in digital access and preservation systems that have interfaces with little or no interaction with informational subjects, such as Web 1.0 interfaces, which lack of interaction, production and informational sharing resources.

In postmodern society, when cultures and social structures are characterized by diversity and instability, everything is flexible, volatile and diverse, DC must involve stakeholders from planning to

the implementation of curation actions and also in strategically use of social platforms.

Postmodernity allows a critical view at the curation process used in contemporary society, and the existence of multiple facets that can emerge with the opening of museums and community participation and collaboration as in these processes, the construction of a transcultural collection is evidenced, provided with values and multiple representations and voices, which disrupts the previous custodial and hegemonic paradigms, the organizational and the technicist scientific paradigm.

REFERENCES

Beagrie, N. (2004). The Digital Curation Centre. *Learned Publishing*, *17*(1), 7-9. https://onlinelibrary.wiley.com/doi/epdf/10.1087/095 315104322710197

Cagigal, P. (2017). Los museos como mediadores de la memoria en la era digital: museums as mediators of memory in the digital age. *Revista de arte contemporáneo*, (3), 22-30. https://dialnet.unirioja. es/servlet/articulo?codigo=6038975

Ceballos, I. L. (2012). El museo. *Revista Instituto Andaluz del Patrimonio Histórico*, (81), 102-108. http://www.iaph.es/revistaph/index.php/ revistaph/article/view/3290#.WtVzSojwbcc

Conarq (2015). *Diretrizes para a implementação de resitórios arquivísticos digitais confiáveis-RdC-Arq*. Rio de Janeiro. http:// www.conarq.gov.br/images/publicacoes_textos/diretrizes_rdc_ arq.pdf

Cook, T. (2001). Fashionable Nonsense or Professional Rebirth: Postmodernism and the Practice of Archives. *Archivaria*, *51*(1), 14-35. https://archivaria.ca/index.php/archivaria/article/view/12792

DCC. (2004). *What is Curator*. Edinburgh. https://www.dcc.ac.uk/ about/digital-curation.

Fetterman, D. M. et al. (2018). *Collaborative, participatory and empowerment evaluation*: stakeholder involvement approaches. Nova York: The Guilford Press.

Hernández Hernández, F. (2016). Documentary sources of museology: reflections and perspectives. En Davis, A., Soares, B. B., Smeds,

K., & Mairesse, F (Eds.). *Museology exploring the concept of MLA* (Museums-Libraries-Archives). V. 44. Paris: ICOFOM. http://network.icom.museum/fileadmin/user_upload/minisites/icofom/pdf/ISS_44.pdf

Hernández Hernández, F. Los museos y el patrimonio en una sociedad líquida. En Magalhães, F.; Costa, L. F. da, Hernández Hernández, F., & Curcino, A. (Coord.). *Museologia e Património*. Leiria, Portugal: Instituto Politécnico de Leiria. https://www.ipleiria.pt/esecs/museologia-e-patrimonio-volume-1/

Higgins, S. (2011). Digital Curation: the emergence of a new discipline. *The International Journal of Digital Curation*, *6*(2), 78-88. http://www.ijdc.net/article/view/184/251

Higgins, S. The DCC Curation Lifecycle Model. *The International Journal of Digital Curation*, *3*(1), 134-140, 2008. http://www.ijdc.net/article/download/69/48/0

IBRAM. (2017). *Caminhos da memória*: para fazer uma exposição. Brasília, DF: IBRAM. https://www.museus.gov.br/wp-content/uploads/2017/06/Caminhos-da-Mem%C3%B3ria-Para-fazer-uma-exposi%C3%A7%C3%A3o1.pdf

ICOM. (2009). *Código de ética do ICOM para museus*. Paris. https://icom-portugal.org/multimedia/File/Cdigo%20tica%20-%202007%20-%20verso%20final%20pt.pdf

Ingles, A. W., Musch, A., & Qwist-Hoffmann, H. (1999). *The participatory process for supporting collaborative management of natural resources*: an overview. Roma: Food and Agriculture Organization of the United. http://www.mekonginfo.org/assets/midocs/0003065-environment-the-participatory-process-for-supporting-collaborative-management-of-natural-resources-an-overview.pdf

Lampert, S. R. (2016). Os repositórios DSpace e archivematica para documentos arquivísticos digi-tais. *Acervo*, *29*(2), 143-154. http://www.arquivistica.fci.unb.br/acervo-revista-do-arquivo-nacional/os-repositorios-dspace-e-archivematica-para-documentos-arquivisticos-digitais/

Lord, P., & Macdonald, A. (2017). E-*Science curation report*: data curation for e-Science in the UK: an audit to establish requirements

for future curation and provision. Reino Unido: The JISC Committee for the Support of Research.

Meehan, N. (2020). Digital museum objects and memory: postdigital materiality, aura and value. *Curator*: The Museum Journal, *23*(1). https://onlinelibrary.wiley.com/toc/21516952/0/0

Sabharwal, A. (2015). *Digital curation in the digital humanities*: preserving and promoting archival and special collections. Waltham: Elsevier.

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, *5*(30), 1-31. https://periodicos.ufsc.br/index.php/eb/article/view/1518-2924.2010v15n30p1

SISEM. (2010). *Documentação e conservação de acervos museológicos*: diretrizes. São Paulo. https://www.sisemsp.org.br/wp-content/uploads/2013/12/Documentacao_Conservacao_Acervos_Museologicos.pdf

Welch, J., & Ipinch Project. (2014). *Cultural Heritage*: What is it? Why is it important? Fact Sheet. Intellectual Property Issues in Cultural Heritage Project, British Columbia. https://www.sfu.ca/ipinch/sites/default/files/resources/fact_sheets/ipinch_chfactsheet_final.pdf

ABOUT THE AUTHORS

Andrea Vasconcelos Carvalho

Doctor in Information and Documentation Systems at the Universidad de Zaragoza (Spain), Master in Information Science and Bachelor in Librarianship at the Federal University of Paraíba. She is an Associate Professor at the Department of Information Science at the Federal University of Rio Grande do Norte. She is interested in Information Science with an emphasis on Information and Knowledge Management, especially in information asset audit, information management, competitive intelligence, content curation and personal information management.

ORCID: 0000-0001-6763-3716

Cristina Portugal

PhD in Design at PUC-Rio, with an internship abroad at the University of Seville, Spain. Master in Design and Bachelor in Visual Communication at PUC-Rio. She specialized in Graphic Design at the U.C. Berkeley Extension California, USA. She completed her Post-Doctorate in Design at the School of Communication at the Royal College of Art, London. She is currently a Research Fellow at CNPq-PQ2. She has been a researcher at the Interdisciplinary Laboratory of Design and Education (PUC-Rio). She has been Editor of *Revista Estudos em Design*. She has worked mainly in the areas of Design, Technology, Communication, Information Design, Interaction Design, User Experience, Education and Interdisciplinary.

ORCID: 0000-0001-5515-9594

Daniel Martínez-Ávila

Permanent Professor of the Graduate Program in Information Science (PPGCI) at São Paulo State University (UNESP). Graduated in Library Science and Documentation at Universidad Carlos III de Madrid (2005), Graduated in Documentation at Universidad Carlos III de Madrid (2007), Master in Documentation Research at Universidad Carlos III de Madrid (2009), and International Doctorate at the Official Program

of Doctorado en Documentación at Universidad Carlos III de Madrid (2012). He was Researcher and Adjunct Instructor at the University of Wisconsin-Milwauke until September 2014 and Assistant Professor at the Universidad Carlos III de Madrid until September 2013 and since September 2019. He has experience in the area of Information Science, with an emphasis on Information Organization. He is a member of the International Society for Knowlege Organization (ISKO) Scientific Advisory Board.

ResearcherID: H-8349-2016;

ORCID: 0000-0003-2236-553X;

Scopus ID: 55164743300.

Denise Fukumi Tsunoda

Graduated in Computer Science at the Federal University of Paraná (1992), she holds a Master's degree in Electrical Engineering and Industrial Informatics at the Federal University of Technology - Paraná (1996) and a PhD in Electrical Engineering and Industrial Informatics - Biomedical Engineering at the Federal University of Technology - Paraná (2004). She is currently a professor at the Federal University of Paraná for the Information Management course, Department of Science and Information Management. She belongs to the permanent group of reviewers of *Revista Produção Online* and *Revista GEPROS* and editorial committee of *Revista AtoZ*. She works mainly on the following topics: pattern discovery in databases, data mining, evolutionary computation, genetic algorithms, genetic programming, and protein information and structure.

ORCID: 0000-0002-5663-4534

Edberto Ferneda

Data Processing Technologist (1985) at the former Bauru Educational Foundation, Master's in Informatics (1997) at the Federal University of Paraíba – UFPB Campus II, Doctor in Communication Sciences (Information Science) (2003) at the São Paulo University – USP, Postdoctoral fellow (2013) at the Federal University of Paraíba – UFPB, and Associate Professor in Information Retrieval. He is currently

Associate Professor at the Information Science School at São Paulo State University (UNESP/Marília). He works in Information Science, mainly in the areas of Automatic Indexing and Information Retrieval. CNPq Research Fellow Level 2.

ORCID: 0000-0002-8808-1217

Iana Uliana Perez

PhD student in Design (UNESP), Master's degree in Design (UFPR), specialist in Strategic Design Management (UEL) and Bachelor in Fashion Design (UEL). She is currently a researcher at the Laboratory and Research Group on Contemporary Design: systems, objects and culture (UNESP) and at the Research Group on Design, Sustainability and Innovation (UEL). She has ten-year experience in research in the area of Design for Sustainability, with an emphasis on Design for Transitions for Sustainability, *Bem Viver*, open design and zero-waste design. She also has recent teaching experience as a scholarship professor for the undergraduate Design course at UNESP and professor of the graduate course in Fashion, Communication and Market at Unopar.

ORCID: 0000-0001-9219-0363

Jordi Planella Ribera

Graduated in Philosophy and Sciences of Education (1993, University of Barcelona), Diploma of Advanced Studies in Education and Democracy (Universidad de Barcelona, 2002) and Doctor in Pedagogy at the same university (2004). Since 2004 he has been a professor at the Universitat Oberta de Catalunya (UOC) where since 2012 he has been Catedrático de Pedagogía Social. Among others, he is the author of the books: (2006) Subjectivity, dissidence and disability; (2017) Transgender Pedagogies; (2014) Organic Solidarity; (2007) The monsters; (2017) Body, culture and education.

ORCID: 0000-0003-0463-4177

José Carlos Abbud Gracio

Bachelor in Computer Science (1987) at the State University of Campinas- UNICAMP, Master and Doctor in Information Science

(2002, 2011) at the São Paulo State University - UNESP/Marília. He was Director of Informatics at UNESP/Marília (1995 to 2009), member of the Superior Committee for Information Technology at UNESP (2009 to 2016) and president of the Permanent Commission for Digital Preservation of UNESP since 2018. Guest lecturer at the Graduate Program in Information Science at UNESP/Marília. His research interest lies in the area of Information Science with emphasis on Digital Preservation.

ORCID: 0000-0001-7620-1309

José Carlos Magro Junior

Master's student at the Graduate Program in Design (PPG Design) at the Faculty of Architecture, Arts and Communication (FAAC/UNESP/Bauru). Specialist in Surface Design (2018) and graduated in Design (2016) at the University of Sagrado Coração (USC/Bauru). Researcher at the Research Group on Contemporary Design: systems, objects, culture (CNPq/UNESP). He is a member of the Laboratory for Research, Extension and Teaching Contemporary Design (LabDesign). His interests involve sociocultural, historical and political analysis through Design; Contemporary Design; Brazilian Design.

ORCID: 0000-0002-2568-2277

José Antonio Frías Montoya

Professor at the University, linked to the Department of Librarianship and Information Science at the University of Salamanca. Doctor in Documentation at the Complutense University of Madrid (1995), he carried out his doctoral dissertation on the structure of information in library catalog databases. Currently, his main lines of research are the application of research methodologies in Information and Documentation, scientific communication on the social web and studies of gender and sexual diversity. Member of the Advisory Board of several Spanish and foreign specialized magazines. Member of different specialized committees. Guest speaker at different Spanish and foreign universities. He is currently a member of the *Junta Gestora de la Plataforma de Centros Universitarios de Estudios Feministas y de Género* (EUFEM) and deputy president of the *Asociación de Educación e Investigación en Ciencia de la Información de Iberoamérica y el*

Caribe (EDICIC).

ORCID: 0000-0002-5425-8950

Laís Alpi Landim

Doctoral student and Master's degree in Information Science at the Graduate Program in Information Science (PPGCI) at UNESP/ Marilia. She holds a degree in Social Sciences at the same university and a Computer Technician degree at Centro Paula Souza. Member of the Research Group "New Information Technologies" (GPNTI). She has worked as Student Coordinator of the Research Laboratory in Design and Information Retrieval (LADRI), in the Description and Digitization project of paleontologist William Nava's collection and the Museum of Paleontology of Marília, and as an Alternate Member in the Student Representation of the PPGCI Council. She conducts research in the field of Information Science, Information and Technology with an emphasis on Information Design, e-Health, Health Literacy and Collaborative Web.

ORCID: 0000-0001-9879-6171

Lucinéia da Silva Batista

Doctoral student at São Paulo State University - UNESP/Marília at the Graduate Program in Information Science (PPGCI). Master's degree at the same program. Member of the Research Group "New Information Technologies" (GPNTI) and collaborator of the Research Laboratory in Design and Information Retrieval (LADRI). She is interested in research on the following topics: Information Science, Information Design, Digital Curation, Social Curation, Collective Approach, Information Representation, Representation Systems, Access to Memory (AtoM), Digital Museums.

ORCID: 0000-0002-8266-9538

Márcio Guimarães

Doctor in Design (2020) at São Paulo State University – UNESP/ Bauru, Master in Design (2014) and Bachelor in Industrial Design (2002), both at the Federal University of Maranhão (UFMA). He is an adjunct

professor at the Department of Design and Technology (DEDET) at the Federal University of Maranhão where he teaches History of Design and History of Art. He is a researcher at the Center for research in Innovation, Design and Anthropology (NIDA) of the UFMA and in the Research Group on Contemporary Design: systems, objects, culture (CNPq/UNESP), where he works in research with emphasis on Inclusive Design, Design for Education and Co-creation. He is currently a member of the Editorial Board of the UFMA (EDUFMA), he contributes as a reviewer to journals *Estudos em Design* (Online), *Design & Tecnologia UFRGS* (Online) and *Projética UEL* (Online) and is a member of the Brazilian Society for the Progress of Science (SBPC).

ORCID: 0000-0002-3964-006X

María-Antonia Ovalle-Perandones

PhD in Documentation at the Carlos III University of Madrid (Spain); hired as a PhD professor and, thus, part of the teaching and research team at Complutense University of Madrid (Spain); member of the research group Politecom (Complutense University of Madrid); of the SCImago group and associate researcher at the Salbis group (University of León); with the six-year research periods recognized by the CNEAI; worked as a documentary filmmaker at Instituto de Salud Carlos III (Spain) and was an archivist at the Oficina Española de Patentes y Marcas (Spain); fellow in Univerzav Ljubljani (Slovenia), Universität Wien (Austria) and University of Wolverhampton (United Kingdom).

ORCID 0000-0002-6149-4724;

ScopusID 25960289300;

ResearchIDs F-8714-2014, J-5909-2012, Q-5144-2019

Maria Cristina Vieira de Freitas

PhD in Librarianship and Documentation at the University of Salamanca (2010), Master in Information Science at the Federal University of Minas Gerais (2003), Specialist in Preservation of Works on Paper at the Federal University of Paraná (1999) and Bachelor in Documentation and Archival Science at the University of Aveiro (2007), and in History at the Faculty of Philosophy, Sciences and Language at

Cataguases (1992). She is an Assistant Professor at the University of Coimbra where she teaches undergraduate and graduate courses in Information Science. She has supervised several master's thesis, doctoral dissertations and extracurricular internships. She has a registered presence on nearly one hundred Masters, Qualification, Masters/ Doctoral consortiums and Doctoral defense boards. She is currently Director of the Master in Information Science (University of Coimbra, 2019 -), Director of the Archive of the University of Coimbra (2019 -) and member of the Research Center CEIS20 (University of Coimbra), of the ARBIDOC Group (University of León, Spain) and the Teresa Andrés Group (University of Salamanca). The main research interests are archival theories and methods, archival information organization, information and knowledge management and qualitative research (with emphasis on software used for data collection and analysis).

ORCID: 0000-0002-8849-8792

Maria José Vincentini Jorente

Visiting Professor at Carlos III in Madrid by CAPES Print. Adjunct Professor and Researcher at São Paulo State University – UNESP/ Marília, Department of Information Science. Lecturer in Digital Culture and Post-Custodial Information in Collaboration Networks. Doctor at the Graduate Program in Information Science at the UNESP/Marília. Product Design Specialist. Degree in Arts at Fundação Armando Álvares Penteado (FAAP) and in Literature at the of São Paulo University (USP). Researcher in the areas of Information and Technology, Digital Curation, Media, Intersemiotics, Information Design and Gender Issues related to ICTs. Member of the Librarianship and Archival Science council boards and Graduate Council in Information Science at UNESP/Marília. Member of the Research Group "New Information Technologies" (GPNTI). Member of the scientific committee of funding agencies and journals in the area of Information Science.

ORCID: 0000-0002-0492-0918

Marian Blanco-Ruiz

Doctorate in Investigación en Medios de Comunicación at the Universidad Carlos III de Madrid (UC3M, 2018, Cum Laude, International

Mention). Degree in Journalism and Audiovisual Communication (UC3M, 2012). She is currently a professor at the Facultad de Ciencias de la Comunicación de la Universidad Rey Juan Carlos de Madrid (URJC), teaching disciplines in the área of Publicity and Audiovisual Communication. Her research lines focus on Gender Studies, the analysis of gender representations in communication media and new technologies in young people. She coordinates and directs different R+D+i activities such as the International Annual Congress of Young Investigators with a Gender Perspective or the UC3M Permanent Seminar on Gender Violence (both since their creation in 2015/2016). Member of ECREA, Research Group on Gender and Feminism (URJC), PASEET (UC3M), the Instituto Universitario de Estudios de Género (UC3M) and UC3M4Safety, with the latter, she has obtained awards such as the Vodafone Innovation Award (2019), Mención Local Premios 8M (2019) and in 2018 she was a semifinalist in the international XPrize Women's Safety.

ORCID: 0000-0002-7920-5978

Mariana Cantisani Padua

Postdoctoral fellow (PNDP/CAPES) at the São Paulo State University – UNESP/Marília, Graduate Program in Information Science/ UNESP-PPGCI. Doctorate at the same program. Master in Information Science at the Federal University of Paraíba. Graduated in Design with specialization in Visual Communication at the Pontifícia Universidade Católica de Goiás /PUC-GO. Her research interest lies in the following areas: Information Design, Interaction Design, User Experience (User eXperience - UX), Museology, Information Science and Pervasive Information Architecture, researching the practices that enable access to information (accessibility) and its use (usability).

ORCID: 0000-0003-1245-3608

Mirelys Puerta-Díaz

Doctorate at the Graduate Program in Information Science (PPGCI) at the São Paulo State University – UNESP/Marília, in the research line "Information Production and Organization". Master in Library and Information Science (2016), Bachelor in Library and

Information Science (2011), both at the University of Havana. She has held the position of assistant professor at the University of Havana since 2017. PROEX / CAPES Fellow (2018-2022). Member of the international project "Understanding the dynamics of opinion and language using massive data (OpLaDyn) Process #2016/50256-0 by FAPESP, belonging to the Transatlantic Platform for Social and Human Sciences (T-AP) Digging into Data Challenge. 2nd "MARCELO DASCAL" Prize for Cognitive Science offered by the Brazilian Society of Cognitive Science 2019.

ResearcherID H-2208-2016

ORCID: 0000-0002-2312-2540

Scopus ID do autor: 57211278244

Mônica Moura

Postdoctoral Internship at the University of Minho/Research Center in Textile Technology, Guimarães, Portugal. Post-Doctorate at the Pontifícia Universidade Católica do Rio de Janeiro, Department of Arts & Design. PhD and Master at Pontifícia Universidade Católica de São Paulo, Graduate Program in Communication and Semiotics. Bachelor and Licentiate in Arts Education at Belas Artes de São Paulo. Interior Design Technician at ETE Carlos de Campos. Since 2010, she has been a Professor at the the São Paulo State University – UNESP, Faculty of Architecture, Arts and Communication and Design (FAAC), Department of Design (responsible for the Graphic Workshop and Project III disciplines and final paper supervisor in Graphic Design and Product Design). Currently, she is coordinator of the undergraduate course in Design. She participates in councils and commissions and works for the Graduate Program. Graduation in Design (as an accredited professor and doctoral and master's advisor - responsible for the discipline Contemporary Design). She is Coordinator of the Contemporary Design Research, Extension and Teaching Laboratory (LabDesign) and Leader of the Research Group on Contemporary Design: systems, objects, culture (CNPq/UNESP). Ad hoc referee for Brazilian research funding agencies. Founding member of SBDI (Brazilian Society of Information Design), 2002 and ABEPEM (Brazilian Association of Studies and Research in Fashion), 2009, where she worked in the management, organization of scientific events and publications. She works on the

following topics of interest and research: Contemporary Design; Design Theory and Criticism; Political and Social Actions in Design (Inclusion, Social Innovation, Sustainability), Memory and Stories, Authorship in Contemporaneity.

ORCID: 0000-0002-9994-6669

Natalia Nakano

Postdoctoral fellow by CNPq at the São Paulo State University – UNESP/Marília, in the Graduate Program in Information Science/ UNESP-PPGCI. Doctor and Master at the same program. Member of the Research Group "New Information Technologies" (GPNTI) and collaborator of the Research Laboratory in Design and Information Retrieval (LADRI). Her research interests include Information Science, Information Design and Universal Design to optimize access and accessibility on EaD platforms.

ORCID: 0000-0002-3217-2515

Rosa San Segundo

Professor at the Universidad Carlos III de Madrid in Information and Documentation and president of the *Plataforma Universitaria de Estudios Feministas y de Género*, and representative of the *Instituto de Estudios de Género*, she is a specialist in gender equality and violence. Specialized in Classification System, Knowledge Organization and Gender Studies, topics of concern to her research and teaching, with gender violence as one of her main areas of research. She is currently co-IP of the Project *"Protección integral de las víctimas de violencia de género mediante computación afectiva multimodal"*. She belongs to the board of directors of several NGOs working for equality and against gender violence. Speaker at more than 150 conferences, she has given specialized teaching on Gender Equality and Violence in different institutions, universities, municipal councils, national and international organizations.

ORCID: 0000-0002-1449-8175

Stephanie Cerqueira Silva

Doctoral student at the Graduate Program in Information Science (PPGCI), in the research line Information and Technology at the São Paulo State university -UNESP/Marília. Master's degree at the same program. She develops research related to the themes of Information Design and multimodal languages on digital environments of women's museums. Undergraduation in Librarianship at UNESP/ Marília. Bachelor in Social Communication - Publicity and Marketing at Universidade Paulista (Unip). Member of the Research Laboratory in Design and Information Retrieval (LADRI).

ORCID: 0000-0001-7533-496X

Telma Campanha de Carvalho Madio

Graduation in History at PUC/SP, specialization in Archives at IEB/USP, Master's in History at PUC/SP and PhD in Communication Sciences at ECA/USP. Lecturer in Photographic Document at the São Paulo State University – UNESP/Marília. She is associate professor at UNESP/Marília for Department of Information Science, teaching courses at undergraduate and graduate levels. She works in the lines of research: Information Production and Organization, Information Management and Professional Training with topics related to analog and digital documents: archival organization and identification, photography, audiovisual collections, preservation.

ORCID ID 0000-0002-7031-2371

William Barbosa Vianna

Associate Professor at the Federal University of Santa Catarina. Department of Information Science. He is currently Coordinator of the Bachelor's Degree in Information Science (2019-2021) and Coordinator of the Network and Extension Program of the GIC Network: Information and Knowledge Management Network (2019-2024). Field of Knowledge: Information Science. Area of expertise: Interdisciplinary in Information Management. PhD in Production Engineering (2011). Professional Master in Administration (USF, 2004). Master in Production Engineering (UFSC, 2008). Graduation in Human Sciences - Philosophy

(UCDB-1989). Areas of interest: (1) Strategic Information Management; (2) Digital Curation; (3) Data Science and Business Intelligence; (4) Assistive Technology and (5) Epistemology & Interdisciplinary Topics in Information Management. He is the leader of the research group on Strategic Information Management, Entrepreneurship and Innovation. Co-supervisor of master's and doctoral degrees and visiting professor at the 2nd and 3rd Cycle of Information Science at the University of Coimbra - Portugal.

ORCID: 0000-0002-5747-8748

Clara Sainz de Baranda Andújar

Visiting Professor at the Department of Journalism and Audiovisual Communication at the Carlos III University of Madrid (UC3M). PhD from the same institution, through the "Investigación en Medios de Comunicación" program. Graduated in Journalism (UC3M) and in Art History (Complutense University of Madrid). Specialist in production for audiovisual media, from development to distribution.

The world of presences is simulated, presented and represented on digital environments. In the context of digital-virtual communication, and from the recent transformations on their supports, information multimodal collections move to a state in which informational subjects' access to information can be facilitated and expanded.

In such a universe, represented information and data need conceptual and technical treatments that respect the nature and particularities of the media and languages that transit through them. In addition, as they are processed on a fragile medium such as the digital medium, information encoded on electronic media also needs procedures and curation aimed at its integral preservation.

In Information Science, the set of continuous and iterative procedures aimed at meeting the demands of curation to optimize access and preservation is named Digital Curation: a complex of processes that range from the initial design and conceptualization, to metadata designation, appraisal for preservation or disposal decisions, transformation, access, sharing and re-appraisal of digital objects.

When it comes to gender issues, conditions are more acute as the need for Digital Curation becomes more pressing when we are faced with the dramatic events concerning its multiple territories. In them, information must be processed with the socio-cultural purpose of creating strategies and instruments to overcome numerous challenges and current injustices.

The book *Digital Curation and Gender in Information Science: access and preservation* addresses, through the combined vision of authors from the national and international panorama, issues concerning some gender issues in the perspective of improvements provided by Digital Curation actions and the particularities of preservation and access that apply.

———————————

EDICIC

CULTURA ACADÊMICA Editora

CAPES

ppgci unesp

uc3m | Universidad Carlos III de Madrid
Instituto Universitario de Estudios de Género

ISBN 978-65-5954-327-4

9 786559 543274

CAE

DIGITAL CURATION AND GENDER IN INFORMATION SCIENCE