



Landscape and cultural heritage: Object and information

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ABSTRACT

Culture and Museology use information and communication technologies as mediating communication tools, enhancing the conservation and "socialisation" of museum collections, promoting access to cultural information, through the interdisciplinarity required between the museologist and other professionals who, together, organize and disseminate the collections. In the age of digital transformation, we live in, this reality is even more evident. The museum transforms objects into perceptible information as it is a repository of information. The common link between Museology and Information Science involves valuing the human action of creating, interpreting, using, selecting and distributing knowledge products and records, thus creating a connection with the concept of information.

Information is central to the process of cultural development. This communication clarifies the relationship between Information Science, Heritage and Museology, presenting the information professional as a partner of Museology, working the object as a document with communicative properties, as a message intended for a specific audience and as information that impacts that audience.

1. Introduction

This article aims to present the close relationship between Information Science, Heritage and Museology and to explore the informational object (regardless of its materiality) as an informational item capable of transmitting a message, from a sender to a receiver, and therefore it can also be worked on by Information Science professionals. It also intends to present projects in which this proximity and this area of action is explored by future information professionals in the context of the digital transformation.

The literature review allowed us to identify important perspectives and conclusions drawn from the studies of several authors and researchers in Information Science such as the fact that digitisation and preservation initiatives are increasingly important as ways to highlight cultural heritage and landscape, leading to the creation of new services and resources, that is, a true digital transformation, promoting the very preservation of communities' identity heritage, in line with information curation, enhancing strategic planning and implementation of measures to leverage unique cultural assets for the economic and cultural benefit of the community.

[1]Silva and Ribeiro define information as

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(...) structured set of codified mental representations (meaningful symbols) socially contextualized and able to be recorded in any material support (paper, film, magnetic tape, compact disc, etc.) and, therefore, communicated asynchronously and multidirectionally (...) (p. 37).

The same authors [1] also refer that the definition of information should be complemented with the different properties of information

(...) structuring by action (human and social) - the individual and/or collective act bases and structurally models the information; dynamic integration - the informational act is implied in or always results from both the internal and external conditions and circumstances of the subject of the action; pregnancy - enunciation (maximum or minimum) of the active meaning, that is, of the founding and modelling action of the information; quantification - the linguistic, numerical or graphic codification is quantitatively valuable or measurable; reproducibility - the information is reproducible without limits, enabling subsequent retention/memorisation; and transmissibility - the informational (re)production is potentially transmissible or communicable. (...) The information is distinguished, without being separated, either from knowledge or from communication, constituting not an undefined and ethereal substance, but a phenomenon (human and social) susceptible of being scientifically known (...) (p. 42).

Still, for Ribeiro [2].

These elements that characterise Information, namely human and social phenomenon and dynamic process through which communication is consumed, allied to the definition presented above, constitute therefore, in synthesis, the minimum and fundamental bases for the scientific discourse on what we consider to be the object of study of a theoretical-practical area in consolidation, which determines professional competencies in conformity with the respective theoretical basis and with the demands of professional performance in the "field". (...) (p. 7).

In this sense, according to Silva [3], through its properties, information is wedged as a phenomenon and as a process, which meets the notion of behaviour and how it relates to each of the "stages" of its cycle - creation, dissemination, organisation, storage, search and use. The author starts, then, from this definition of information to justify the reason for this transdisciplinary approach, being that it does not make sense that the format overlaps the content, when involving the Archive, the Library, the Scientific Documentation Centre/Service, the Memory Centre, and the Information Technological System, in which they deal with this same object of study.

Buckland [4] states that objects are not "classic" documents, but information resources, assuming the concept of information as a thing. Effectively objects are collected, stored, retrieved, and examined as information, and, as a basis for information. It does not make sense, therefore, to exclude them from the vision of information, information science or information systems that would not also include objects.

Wersig [5] states that the information is derived from 3 sources.

- 1) Internally generated by mental effort;
- 2) Acquired through perception of phenomena;
- 3) Acquired by communication.

Buckland's "information as a thing" thus links up with Wersig's [5] sources 2 and 3 since it arises either through the perception of infocommunicational phenomena, or the communication of something.

The question about whether the museum object is information or an object that raises information, is a theme that has also promoted wide debate among museologists, namely between Zbynek Stransky [6] and Ivo Maroevic [7]. Stransky [6] recognises the importance of documentation and its relationship with the technical procedures of description, classification, indexing, etc., however, he believes that the museographic object, the one which was given the status of museality, cannot be considered a document, in the strict sense, because it is a source of consciously created information or information fixed in a *medium*. He also admits that the appropriation of reality through museum collecting has in itself a documental character. In turn, Maroevic [7] has a position that seeks to frame museology within the theoretical framework of Information Science. Thus, Maroevic [7], starting from the object as an information carrier (data carrier) created the category of INDOC (information-documentation object) since the different types of knowledge (historical, social, artistic, geographical, etc.) that we can obtain through the study of objects, come from two sources of information: the first one relates to information about the object (documentation) and the second one, is related to the information generated by the object. Both authors agree that museology pivots around cultural and heritage information and musealisation is a basic function of the museum, but Maroevic [7] considers museality as information and Stransky [6] as value.

Maroevic [7] develops and presents the informational structure of the object as document based on three levels.

- First level: object as document containing the following communicative properties: form, function, context and meaning;
- Second level: object as message resulting from the interaction between object as document and subject as transmitter;
- Third level: object as information resulting from the impact and the meaning of the message.

Today's integrative society promotes openness and interdisciplinarity. Currently, one way to transmit information is using digital platforms, if not the main way of transmitting information, since we are living in a context of digital transformation. Effectively, cultural digital repositories emerge as mediating tools and can employ techniques like those of generic systems to solve standard issues for search and retrieval of objects. Cultural heritage objects are rich in content, describing events, monuments, places, people, etc. and

many are distributed across different locations. Users of such platforms can formulate queries using different modalities such as free text, similarity matching or metadata to access this information.

Tomislav Sola [8] states that the way forward is interdisciplinary coordination between Archival, Librarianship, Museology, Communication Sciences and Information Science. The author highlights the holistic and synoptic nature of our post-industrial society which encourages the most diverse manifestations of integration, interdisciplinarity, creativity and openness, arguing that a new museum theory should possess these same characteristics. For Sola, the museum of the future is an evolving organization that constantly presents relation challenges between Man and Heritage. The obligatory path to follow is one of interdisciplinary coordination between archival, librarianship, museology, communication sciences and information science and so the author states "The presence of the museum in such an array is justified by the informative nature of the museum piece and the museum's powers of communication" [8]. As stated by Martins, Carvalho & Pinto [9] Sola [8] proposes an integrating theoretical conception, which he calls Heritology (patrimology), presenting it as the study of the future of the collective experience, a science focused on the concept of total heritage. This holistic conception presents the vision of a "total museum".

Johanna Smit [10] tells us that document and information contain the two sides of the same coin: some pay more attention to one side, others to the other, but it is not possible to detach the sides of the coin. She refers to the necessary change between the emphasis on the *acquis* (the remaining paradigm) to an approach on the user (new paradigm), that is, from the *acquis* to the function and use of information. The author [10] mentions

*We continue formalising the question from the *acquis* paradigm (...), without realising that these distinctions are no longer justified or anchored in the current discourse (...) The emphasis on the user does not ignore the document, but subordinates its importance to the function or use of the information (...) if the emphasis on the document loses space to the emphasis on the user, the distinction of institutions based on documents is no longer relevant (p. 30).*

In fact, information has become dematerialised and is mainly accessed, used and assimilated by the user if it is conveyed and made available through the digital platforms that the user actually uses, and those that are more intuitive and simpler to navigate or consult are effectively the most used. The information that is difficult to access and in non-digital media, such as paper, common in collections until the twentieth century, is no longer requested by users, opting to search for information on their digital devices or more sophisticated and user-friendly devices with rich cultural and scientific content. Therefore, the document is not as interesting as it once was, but instead the concern of those who produce the information is how the user will access it and how they will understand it.

1.1. The triad information Science, heritage and the information professionals

Regarding the connection between IS and Museology, Silva [11] (cit. by Ref. [9], p. 346) "considers important to understand the binomial mind-fact-artifact. Mindfact is the mental and emotional idea/representation, it is information ready to be materialized; Artifact is the idealized material and functional product or derived from the mental and emotional representation" and presents limitations of the separatist vision between Information Science and Museology.

- the confusion between "content" and "institution", i.e., one confuses Archive (institution) with Archive (fund); Library (institution) with document collection; Museum (institution) with physical space with two/three dimensional objects;
- the lack of uniformity of parameters, some having been conceived considering the Archive, the Library and the Museum as organisms/services, while others refer to the cultural heritage they store, and still others directly or indirectly call upon the respective disciplines (Archival, Librarianship and Museology), such as the objective and technical processing.
- the emergence of several paradoxes: the notion that the producer of the Archive/fonds is the administrative machine and that of the Library and Documentation Centre is human activity, as if administration existed outside human will; fixing the objective of the Archive in proving and witnessing while that of the Library, Museum and Documentation Centre in informing, which ends up excluding the capacity of bibliographic and museum collections to serve as evidence and witness, as well as excluding the informative component of archival documentation.

The emerging post-custodial, informational and scientific paradigm is filling part of the crisis felt in the old paradigm, and emerges [11]

associated with the evolutionary perspective that announces as inevitable the emergence of a transdisciplinary Information Science (IS), that is, that aggregates within itself and results from the fusion of the practical disciplines of Archiving, Librarianship and Documentation" (p. 25).

Buckland [4] presents the concept of information from a framework, understanding it as a cyclical dynamic.

- Information as a process: the act of informing;
- Information as knowledge: perceived from the process, intangible, personal, subjective and conceptual;
- Information as an object: objects can be informative; tangible; they house the expression, description or representation of something, in physical form.

In view of the performance of the information professional, we cannot dissociate ourselves from the term information curation. Kim, Warga & Moen [12] refer the following



Fig. 1. The Upper douro valley.

Source of information: <https://www.viajarentreviagens.pt/portugal/regiao-alto-douro-vinhateiro/>

Curation, which involves various activities that help facilitate discovery, access, dissemination and archiving of information, is what librarians or archivists have done for hundreds of years. This implies that the similar skill sets used in traditional library work may be beneficial to curation work involving digital data and information (p. 68).

For Ochoa [13] there are several professionals in the Information-Documentation area who have

their mission is to find information for professional use (after having learned how to search for it), process it to increase its usability, manage it, make it easily accessible and transmit it to those who need it, whether users or customers. This is what librarians, documentalists, archivists, conservators and others do (p. 62).

p. 62

Indeed, for Cragin et al. [14].

Data curation is the active and on-going management of data through its lifecycle of interest and usefulness to scholarship, science, and education; curation activities enable data discovery and retrieval, maintain quality, add value, and provide for re-use over time (p. 10).

The information professional works the object as a document with communicative properties, as a message intended for a certain audience and as information that impacts on that audience. Let us remember the definition of Information Science presented by Silva [15] since it guides the performance of the current information professional (authors' translation):

Information Science is a social science that investigates the problems, issues and cases related to the infocommunicational phenomenon perceptible and cognizable through the confirmation or not of the properties inherent to the genesis of informational flow, organisation and behaviour [...]. It is trans and interdisciplinary, as it is endowed with its own theoretical-methodological body built within the post-custodial, informational, and scientific paradigm, by the contribution and symbiosis of Archival, Librarianship/Documentation, Information Systems and Organisation and Methods (...) (p. 140).

For Estrela [16], the information professionals have an essential role in the management of information as a resource, assuming a central role in the identification and safeguarding of heritage because information is in the core of the articulation between Information Science and Heritage, since both act in the safeguard and dissemination of infocultural heritage [17], as well as natural and environmental, imbued with information, communication, science and "situated knowledge" [18] in a broad sense.

The inventorying, preservation, construction and physical and online dissemination of information resources, the conceptualisation of itineraries, routes, and routes of (in)tangible cultural heritage, popular and erudite literary-artistic, oral and written, are special ways of acting for information and communication professionals in their work as indispensable social mediators in the current digital transformation, information and networking society in which we live.

Interdisciplinary studies by Lage [19–22] refer that memory and identity are constructs of reality, maintaining a very close relationship and even multimodal manifestations; work has even been developed that identifies a Luso-Galician sociolect anchored in oral and literary memories as well as studies of information mediation in the light of Latour's actor-network theory [23] that underline the relevance of actors, procedures and devices involved in a symbolic and practical dimension of culture.

Many of these multimodal manifestations are hosted by museums. Lage [24] assumes that a museum represents multiple temporalities and that the relational issues between information, communication, education, and the use of digital resources are



Fig. 2. Douro museum.

Source of information: <https://www.alamy.es/foto-fachada-del-museo-del-douro-museu-do-douro-en-peso-da-regua-portugal-48938330.html>

preponderant elements in interactive learning, essential in contemporaneity.

As already stated by Martins, Carvalho & Pinto [9], this approach is close to Freland [25] and Rodriguez Becerra [26,27] because it considers societal traditions, inherited from our ancestors and passed to our descendants, comprising language and customs, folklore and musical and artistic traditions, dances, homemade products and culinary specialities, crafts, trades and ancient know-how.

In society there is a cultural choice underlying the will to bequeath this heritage, which, according to Ballart [28] and reinforced by Martins, Carvalho & Pinto [9], promotes the sense of belonging to future generations. For Silva [11], the fact that heritage allows the creation of an identity of socio-cultural values as well as the sense of belonging to “imagined communities”, is of the greatest importance [29].

The UNESCO Convention for the Safeguarding of the Intangible Cultural Heritage [30] identifies criteria that ensures the viability of intangible cultural heritage: identification, documentation, research, preservation, protection, promotion and enhancement. This enables the revival of the different facets of this heritage and considers that different measures are indicated to different types of heritage.

As said by Martins, Carvalho & Pinto [9] “the identification, collection and safeguarding of community infocultural heritage, promoting its development and sustainability is an area of activity of the information professional and is strategically aligned with UNESCO’s definition of cultural heritage [30], which includes, among others, oral traditions, social practices, festive events, knowledge and practices about nature” (p. 345).

The cultural landscape of the Alto Douro Wine Region, illustrated by Fig. 1, is itself

[31] *directly related to the attributes (tangible and intangible) that give it exceptional universal value, at the level of the interconnections they establish, applicable to authenticity, as well as the criteria of integrity that allow an appreciation of the state of the physical fabric of the property, the maintenance of the relationships and the dynamic functions present* (p. 2).

It is assumed as a set of

[31] *peoples and cultures, of adapting specific techniques and knowledge of vine cultivation to produce world-renowned wines, corresponding to the “Porto” and “Douro” appellations of origin, but also of other Mediterranean cultures, such as the olive tree and the almond tree* (p. 1).

Considered as a unique heritage, it will always depend on the people and the activities they develop that give it distinction, based on the matrix of the vineyard and wine culture, besides other endogenous products, materialized in a territory with a strong economic and social dimension.

Informational heritage is perceived as an agent generating value and promoting differentiated identities, it is an essential element to start, distinguish and enrich socio-economic activities based on local environment and local culture, linked to practices related to the economy of the sea. Heritage is here understood as environmental culture, complex ways in which culture and environment intersect, learned behaviours, attitudes, practices and knowledge of a community and its natural resources, the ecosystem and all other external conditions that affect human life, the human economy and vice versa.

In this context, we highlight the Douro Museum, located in the city of Peso da Régua, understood, since its creation, to be a museum of the territory associated with the Demarcated Douro Wine Region, World Heritage.

[32] Fauvrelle considers this cultural equipment fundamental for the knowledge of the different heritage sites

its mission to gather, preserve, identify, and disseminate the museological and documentary heritage scattered throughout this territory, constituting an instrument at the service of the socio-cultural development of this region. From a perspective of community museology, the Douro Museum is seen as a process whose development should involve active collaboration with local, regional, and international institutions (p. 147).

Based on the action in the community of the Demarcated Douro Region, considering not only the collections but also the values of the regional tangible and intangible heritage, anchor elements for the community, the author [32] promotes a museological concept that moves away from the centrality of the building, its content, and its audience. In this sense, the permanent exhibition "Douro: matter and spirit" allows visitors to obtain clues for exploring the region and, for the inhabitants of the Douro, to feel the appreciation of their heritage, labour and history. Distinct activities such as the itinerant exhibitions and the diversified programming of the educational service, encompassing not only the museum's collections but also the Douro heritage, are examples of a more comprehensive and holistic action.

The Douro Museum, presented in Fig. 2, is part of three networks: the Douro Museum Network (MuD), the Network of Portuguese Wine Museums (RMPV) and the Portuguese Network of Museums (RPM). The first includes public and private museum initiatives, working together to promote the development of the Douro axis, from a cultural perspective, encompassing tangible and intangible collections relevant to the project and its objectives are

[33] (...) among others, to create the adequate conditions to give voice to the Region's cultural diversity and cultural experiences, bringing the cultural offer closer to the populations, inside and outside the Region, namely with a systematic dissemination of its members' activities through a digital information network (p. 81).

We now return to Nora's understanding [34] who tells us that from the perspective of the place of memory, the term geoculture (of the sea or the mountains) makes sense because the economy of the maritime or mountain communities cannot take place without the culture of the sea or the mountains, the sea and mountain territories and the inhabitants who use them, being mobilised and motivated to participate in this movement, as they are an integral part of it.

Several tourism activities are indeed holistic innovative initiatives, based on cultural tradition, nature and human activity and are able to enhance local heritage and promote local development [35–38]. But, as stated by Martins, Carvalho & Pinto [9], the local residents' perceptions are crucial for designing these initiatives and their sustainability as they are intended to be integrative and accessible to all.

One of the challenges is the uneven capacity to identify and properly activate this community information heritage for the benefit of these same communities. Also, in order to promote the success of these initiatives other actors should be considered such as local government bodies and researchers. This allows the heritage to be valorised and to preserve it, highlighting the mediation of information between these actors and by information professionals [39].

In addition to the training of professionals and the increase of their skills in information and communication technologies, it is also found that to achieve a full appreciation of information as a human and social phenomenon, it is necessary to intervene in education, collaboration, and forms of interaction with users, thus providing the promotion of literacies and means for access to information [9]. As Carvalho [39] refers "(...) the knowledge of the specific needs of users and information professionals, lies in the heritage of the informational heritage" (p. 358) (authors' translation). It is possible and desirable, in the framework of a current mediation, that information professionals develop around principles that allow to articulate the progressive domain of information and communication technologies in the custody, conservation, organisation, selection and evaluation of increasingly considerable volumes of information, with the rigorous knowledge of the needs and profiles of information use by users.

In the Information Age, of the democratisation of access to information, integration, and survival of institutions in a more globalised world, it is necessary to reflect on their new roles, functions and needs, a new field where infomediation takes on a focal position in defining objectives, strategies and directions.

Examples like the ones we have described also serve to attest to the idea that to reach knowledge, physical access to technologies is not enough, but, above all, it is necessary to stimulate multiple cognitive processes, mediation and contextualisation which are prerequisites to apprehend and understand formative and informative contents.

As stated by Martins, Carvalho & Pinto [9] "thus, the information professional will also dedicate himself to the development of other instruments and mechanisms of mediation, since access to information in conditions of equity is one of the main factors for overcoming social inequalities." (p. 346).

The role of the professional trained in Information Science in the construction of the information society should understand the complexity of the infocommunicational phenomenon and face diverse mediation scenarios, as they are a new type of mediators, experts in information evaluation (related to the selection and supply of only useful and relevant information to the end user who seeks it), and, simultaneously, a guarantee of the past and future, as the nowadays challenges demand answers that are holistic, systematic, meta-empirical, searching for new limits and corresponding to the trans/interdisciplinary Information Science.

1.2. Examples of projects of action of the information professional

As already mentioned, information is considered a generator agent of value and differentiating identity and is an essential resource for the creation of distinctive activities that enhance local realities and heritage. Future information professionals in the Degree in Documentation and Information Sciences and Technologies (DDIST)) acquire skills in retrieving, collecting, recording, and processing information in any support for future memory and recreation.

2. Methodology

In Portugal, there have been a few studies published on the relationship between Information Science and Museology and how professionals from these two fields can work together. In this article, we used a literature review methodology.

The bibliographical search that served as the foundation for the literature review involved the use of various digital sources of previously identified concepts: B-on, which is an aggregator of various professional and academic repositories and databases; the Open Repository of the University of Porto; the Open Repository of the Polytechnic Institute of Porto and the Open Repository of the University of Aveiro.

These four sources were chosen because B-on not only has access to multiple scientific articles, dissertations and books, but also redirects us to other databases that will present another set of results. The open repositories of the University of Porto, the Polytechnic Institute of Porto and the University of Aveiro were chosen due to the fact that they are universities and therefore, they tend to have greater access to academic work, allowing us to check whether the topic had already been or was being explored in academia.

The search terms used were "Information Management", "Information Science", "Museum" AND "Museology" and "Cultural Heritage". The choice of these queries was based on the following criteria: "Museum" and "Museology" are essential concepts and part of the central element, since this is the theme around which the work is centred. In the case of B-on, the choice to use the Boolean operator "AND" for the two terms together was due to the fact that several articles and dissertations chose not to use the keyword "Museum", but rather "Museology", so that the inclusion of all works that chose to consider the concepts "Museum" and "Museology" would be guaranteed. In the Open Repository of the University of Porto, it was decided to search only for "Museology", since the articles/dissertations related to museums fell under the heading of "Museology". In the case of the repositories of the Polytechnic Institute of Porto and the University of Aveiro, we opted for two concept searches, one for "Museum" and the other for "Museology", due to the small number of results and the fact that some papers with the concept "Museum" under the "subject" filter were already under the "Museology" topic. The reason for choosing to research "Cultural Heritage" was the presence of the concept of "Cultural Heritage" in several Museology dissertations. The concepts "Information Management" and "Information Science" were also considered, given their relationship and the specific nature of the work being carried out, covering aspects linked to the way information is stored and communicated to the public.

Regarding the search results, the various concepts were filtered at certain points, in the case of B-on, the concept "Information Management" was filtered as follows: SU Subject terms; Language "Portuguese"; 1980–2022; Full text; Academic journals; Subject - "information management"; Publication - "information science", resulting in a set of 44 accessible results. The concept "Information Science" had the same filters, except for the changes in the Subject fields, which now include "information science", resulting in 29 results. The "Cultural Heritage" concept also saw a change in the subject, to "museums and museology", and in the type of content, adding dissertations to academic journals, resulting in 23 results. The concept "Museum" AND "Museology" focussed on "academic journals" and "dissertations", and the subject was filtered by "museums" and "cultural heritage".

The results obtained from the various repositories were filtered only by the concept "Subject". More specifically, the Open Repository of the University of Porto presented 36 results (27 for "Museology" and 9 for "Museum"), the Open Repository of the Polytechnic Institute of Porto presented 5 results, The Open Repository of the University of Aveiro presented a set of 11 results, with 6 in "Museology", 4 in "Museum" and 1 in "Museum". As this is not a systematic literature review, the choice of documents to be used was based on the authors' personal judgement.

Other free searches, using natural language, were carried out on search engines in order to broaden the potential results obtained.

It should also be noted that the languages searched were Portuguese and English and that the formal sources used allow the records to be imported into the bibliographic reference manager used, Zotero, and that in the case of B-on, it is possible to access the subscribed full texts using the Polytechnic Institute of Porto's VPN (Virtual Private Network).

The selected *corpus* of documents contributed to the development of the literature review that underpins this work.

3. The Fisherman's trail

The case of the project "The Fisherman's Route" consists in local sustainable development, creating tourism services and resources, based on the fishing tradition and identity of Caxinas and Poça da Barca - Vila do Conde, District of Porto, Portugal. The project promotes: sustainability associated to development; use of new technologies; different working methods in multiple domains. Implementing sustainable tourism means applying new concepts of development, adopting new technologies and different working methods in multiple domains. This implementation enables the creation of new activities and new quality tourism products, favouring the contact of Man with Nature and valuing local heritage, history and culture.

In 2015 the Vila do Conde Parish Council contacted the School of Industrial and Management Studies (ESEIG) to develop the project with Degree in Documentation and Information Sciences and Technologies (DDIST). The project begins with a fixed team composed of DDIST teachers and with the collaboration of elements of the Design course and the Hotel Management and Administration course of the mentioned institution. In 2016, due to the extinction of the Institute named ESEIG, DDIST migrates to the «Instituto Superior de Contabilidade e Administração do Porto», and the project continues with the same team of teachers. This project has been carried out under the DDIST curricular internship, which includes 192 h of work. These internships result in reports that are presented and defended before a jury.

"The Fisherman's Route" is a joint project, of infocultural and touristic nature. It aims to preserve the identity and cultural connection of the city of Vila do Conde to fishing and its fishermen, which has in the place of Caxinas and Poça da Barca one of the largest fishing communities in the country and, simultaneously, the dissemination of the same, as it can be seen in the video about the

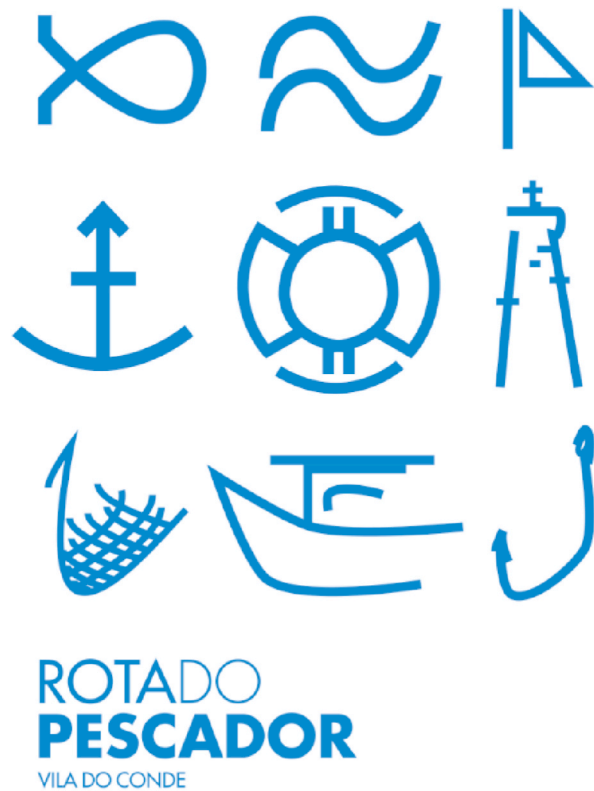


Fig. 3. Logo of the "Route of the Fisherman" project.

Source of information: https://www.facebook.com/rotadopescador/?locale=pt_PT



T-shirt Rota do Pescador

Cap, t-shirt, bag, and badge Rota do Pescador

Mug Rota do Pescador

Fig. 4. Merchandising proposal associated to the project.

Source of information: Project

project, available at the link: <https://www.facebook.com/rotadopescador/videos/600796260096007/?t=80>.

Within the scope of sustainability, the parish council adopts a policy of proximity between knowledge and fishing communities and also intends to promote a greater connection between higher education and the city. The project's objectives are.

- Collect, recover and recreate tangible and intangible elements associated with these communities;
- Develop an electronic platform (portal) to make this information available;
- Create a tourist trail by signposting buildings, places, people and assets;
- Create new elements by recording audiovisual testimonies of active and retired fishermen, many of them migrants, which will be available on social networks;

EXPRESSÕES CAXINEIRAS

"A ré" – Atrás
"Alar" – Levantar redes
"Anda no Filas" – Anda no mar da Gronelândia
"Avante" – Para a frente
"À cara podre" – Sem vergonha
"A professora aprendeu-me" – A professora ensinou-me.
"Agantar" – Aguentar com coisas pesadas

PROVÉRBIOS

A mulher e a pescada quer-se da mais alentada

PALAVRAS DO QUOTIDIANO

Aceijo - À noite
Adeceibo - Desfaço
Adoçar - Lavar com água doce
Agachar - Esconder
Aganta - Segura
Agoniado – Zangado
Aloquete – Cadeado
Amariar – Atirar

Fig. 5. Preliminary glossary of "Linguarejar caxineiro".

Source of information: Preliminary glossary "Linguarejar caxineiro"

- To consider the heritage of these communities, associated with fishing: fishing gear, photographs, news, images, stories and disseminate them;
- Develop a logo that will be the face of the project;
- Produce typical products that will serve as a visiting card and welcome tourists arriving in the region via Francisco Sá Carneiro Airport, in the baggage claim area;
- Combining fish gastronomy with the dynamisation of gastronomic weekends and the tourist route;
- Organize recreations and street animation, with the collaboration of the local associative movement;
- Establishing international partnerships (Universities);
- The drawing up of a family tree of the fishing families of these communities.

Regarding the methodology of the project, and since it is essentially a positivist study, we opted for a qualitative research design, based on interviews, mainly with a view to collecting information on the informational, cultural, religious, architectural heritage, linked to shipbuilding and to the fishing, clothing and gastronomy collection, results from the application of semi-structured interviews to members of the previously mentioned communities, from the application of questionnaires to visitors of these places and from the documentary analysis of information present in the collection of the municipal library and archive.

As a result of the development of this work and as part of the DDIST internships, the Project logo, presented in Fig. 3 below, was created in conjunction with students from the Design course in the 2015/16 academic year, also as part of the DDIST curricular internship.

As well as the merchandising that came from the same project, as illustrated by Fig. 4.

A survey of typical Caxineiro lingo was also carried out, resulting in a preliminary version of the glossary that will be available on the Portal to be created in the future. It includes everyday words and expressions as well as proverbs. Fig. 5 displays some of the words that are included in the glossary.

Audiovisual material was also collected (interviews with fishermen and their wives) available through the Facebook page - Rota do Pescador created

<https://www.facebook.com/rotadopescador/>. It was also proceeded the survey of several typical recipes of these communities and organized a recreation of the traditional sale of fish with the collaboration of local associative movements, namely the cultural association "Bind'ó Peixe". See: <https://www.facebook.com/bindopeixe/>.

Work was also started on the design of a pedestrian tourist route of approximately 17 km, which includes the places to be developed in a sustainable way. This work involved the survey and identification of fauna, flora, and heritage of interest, as well as the length and altimetry of the route. The registration of the route presupposes that the entity registering the route presents the ways in which it will be signposted and maintained (creation and maintenance of signposting, paths etc.), aspects which are the responsibility of the entity promoting the route.

It would be interesting to include in the route an audio guide (promoting an inclusive approach) and to use augmented reality to highlight the most important aspects of the fishermen's route, while providing an immersive experience comparing natural, urban landscapes and traditions.



Fig. 6. Rūta chocolates.

Source of information: Rūta website available at <http://ruta.lt/en/products/sweets-boxes>

3.1. Mobile tourist recommendation system for metro do Porto

Another project developed under the scope of DDIST is the "Mobile tourist recommendation system for Metro do Porto". This project is based on the idea that heritage is a valuable resource and tourist information interests a large part of the users of Porto Metro. Thus, a recommendation system can be a potential differentiating and innovative resource, capable of leaving positive marks in the perception of tourists and other users regarding Metro do Porto. Furthermore, there is the basic premise that it is necessary to promote the performance of the information professional in innovative and alternative professional contexts, based on information and informational heritage.

The objectives of this project are to carry out a survey of the points of interest around metro stations; to collect different information on points of tourist interest; to make information available in different languages; to create a prototype of an app that combines all the information collected, using the geolocation of the user, so that it is offered at the moment when there is physical proximity to that point of interest; to enhance the value of the metro as a means of transport in relation to the heritage surrounding its transport network.

The project started from a general analysis of the elements that integrate the proximities of the metro stops, in loco and with recourse to tourist information sources available and their registration in excel sheets, as well as the consultation of bibliography of interest and support to the project and a comparative analysis of the possible platforms to use. The elements to include were the existence of an ATM, WC, café or parking, something that the company Metro do Porto considered of great value.

Thus, 82 stops of the Metro do Porto network were analysed and it was concluded that only 52 presented some kind of touristic point of interest. From this universe of 52 stops, 159 points of interest to consider and describe were identified in a first phase. However, in a second phase, and after a detailed analysis, the 52 stops were reduced to 36 and the 159 points of interest to 87 because there were places that were, at the time, closed to the public. Finally, in a third phase, 23 points of gastronomic interest were added, thus totalling 110 points of interest in the proximities of 37 Metro do Porto stations.

The information was recorded considering the fields: nearest metro station, the name of the place, the address, the description of the place, the distance to the nearest station, the cost associated to the point of interest (paid entrance and the value e.g.), the opening hours and the link to the official site of the place.

The points of interest were categorised by creating 4 categories.

1. Historical Heritage/Culture (includes various relevant local, municipal and national sites and also sites providing cultural services);
2. Commerce (commercial premises - sale of products);
3. Leisure (includes the city gardens);
4. Gastronomy (catering and drinks).

The locations were photographed, and the photographs uploaded to the application.

Comparative research of platforms that allowed the creation of an application was also carried out. Among the 19 platforms analysed, 11 were paid access platforms, 2 required programming skills and 6 did not meet the project requirements. We chose the Mobincube platform which is free in the Starter plan and allows the structuring and chaining of information through various menus of hierarchical nature, however it was not possible to use geolocation.

Internationalisation of Rūta products.

The third project is Internationalisation of Rūta products using a smartphone application and aims at promoting a Lithuanian national product. Choice fell on Rūta chocolates, whose chocolate factory is the oldest in Lithuania (Fig. 6).

The development of the project presupposed the diagnosis and recovery of the information already available in several sources of



Fig. 7. Rūta website.

Source of information: Rūta website available at <http://ruta.lt>

information such as the website (as Fig. 7 shows), social media, and the creation of an interview script addressed to one of Rūta's managers. The collected information was analysed and relevant information was selected for the project's objective.

It was necessary to understand the needs of potential users of the application as well as the choice and implementation of the platform for the creation of the app. Thus, an analysis of the existing offer was made, the platform was chosen, the logo for the app was created, the information was organised and the practical implementation (creation of pages and content management) was carried out.

4. Conclusions

The close connection between Information Science, Heritage and Museology is evident as the study object is information and the object form has now a secondary relevance. Another central element to consider are the needs of the users and the target audience of the information.

Nowadays training of the information professionals allows them to perform in collaboration with Museology professionals, not usurping functions, but complementing them, since the current training of information professionals adapts to the new demands of the Information and Knowledge Society, mainly in the context of digital transformation nowadays, allows exploring new areas of action, uses technologies for the benefit of communities and information users.

Strategic planning and implementation of strategies to leverage the unique cultural assets of communities for the economic and cultural benefit of the community as a whole are essential today and also appear as ways of curation and preservation. Cultural digitisation and online accessibility are ways to highlight cultural heritage and thus inspire the creation of new and more content and new online services, as already recognised by the European Commission and set out in the Europeana Strategic Plan.

We believe that it would have been beneficial to develop a systematic review of the literature on the subject, in order to promote a meta-analysis of the subject in question and thus obtain more exhaustive results.

As advantages, we can mention that this work shows how the relationship between Information Science and Cultural Heritage/Cultural Landscapes are related in theoretical and academic terms. Although the literature review shows a portrait of this relationship at a certain time, the free research carried out later overcame this limitation of this type of study, which can be seen as an advantage.

The examples of projects presented, developed within the scope of the DDIST, demonstrate the mobilisation of knowledge and skills in a holistic theoretical-practical perspective that can easily be transposed to the Alto Douro Wine Region and as this is a UNESCO World Heritage Site, it will be important to communicate it and simultaneously safeguard it and draw added value from it, adding value to the chain underlying each productive activity, incorporating the singularity of the territories in question and their own unique characteristics.

In order to fully recognise information as a human and social phenomenon, in addition to training professionals, it will be necessary to invest in information literacy and interaction with users. Information heritage, at a local or global level, is important as it is seen as knowledge of the users' needs but also information professionals, so multimedia needs and requirements become easier to identify. This presupposes a greater interrelationship with professionals and forms of research, requirements demanded by the new technical competences for the use of Information and Knowledge Technologies by users.

The educational needs involved in the projects mean that information professionals work in a variety of areas, more or less traditional, in which information has a positive and sometimes essential impact on activity and business. Students must therefore make holistic use of the various skills acquired during the course and also put into practice transversal skills such as problem-solving and quick thinking. Personal control and leadership also lead to behaviours that tend to increase the likelihood of achieving the educational

goal.

In the future, it is intended to carry out an exploratory project that considers the integration and articulation of what exists, namely Douro Museum, the Network of Douro Museums and the Network of Portuguese Wine Museums through Information Science, Education and Heritage, promoting the enhancement of History, territory, valley, river, mountain, in a holistic approach between Museology, Information Science and new information professionals. We thus consider that the Alto Douro Wine Region may be approached from the point of view of Information professionals within the scope of Information Science.

Data availability statement

The data that has been used is confidential.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.heliyon.2023.e20395>.

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