

Organization and Representation of Musical Information (ORMI) in Portugal: a literature review

Organização e Representação da Informação Musical (ORMI) em Portugal: uma revisão de literatura

CARLOS GUARDADO DA SILVA

Centro de Estudos Clássicos, Faculdade de Letras, Universidade de Lisboa, Portugal

Contacto telefónico: 962451066

carlosguardado@campus.ul.pt

ORCID: 0000-0003-1490-8709

ANTÓNIO BAPTISTA

Faculdade de Letras, Universidade de Lisboa, Portugal

Contacto telefónico: 934801756

antoniobaptista@campus.ul.pt

ORCID: 0000-0002-9185-6335

Artigo entregue em: 28 de setembro de 2021

Artigo aprovado em: 2 de novembro 2021

ABSTRACT

This article presents the results of a documentary research regarding the current state of Organization and Representation of Musical Information (ORMI) in Portugal. Many authors describe the national scene of ORMI as very shortcoming, due to the usual difficulties: time vs. detail in the description and lack of knowledge of musical language by the technicians Information professionals.

A survey of the monographs and papers as of 2011 that make a critical revision to the works of ORMI of several institutions was made, aiming to: 1) perceive their current state and 2) understand its strengths and weaknesses. We identified in these studies the analytic categories to create afterwards a classification structure by disciplinary areas, which shows semantic, structural and quality heterogeneity. The majority of Finding Aids are being produced by musicology projects with structures that respond to their information representation needs.

KEYWORDS: Organization and Representation of Information; Musical Information; Finding Aids.

RESUMO

Este artigo apresenta os resultados de uma pesquisa documental sobre o estado atual da Organização e Representação da Informação Musical (ORMI) em Portugal. Muitos autores descrevem o cenário nacional da ORMI como muito deficiente, devido às dificuldades habituais: tempo vs. detalhe na descrição e falta de conhecimento da linguagem musical por parte dos técnicos dos profissionais da informação.

Foi realizado um levantamento das monografias e artigos a partir de 2011 que fazem uma revisão crítica dos trabalhos da ORMI de diversas instituições, com o objetivo de: 1) perceber o seu estado atual e 2) compreender os seus pontos fortes e fracos. Identificámos nesses estudos as categorias analíticas para posteriormente criar uma estrutura de classificação por áreas disciplinares, as quais mostram heterogeneidade de semântica, de estrutura e de qualidade. A maioria dos *Finding Aids* tem sido produzida por projetos de musicologia com estruturas que respondem às suas necessidades de representação de informação.

PALAVRAS-CHAVE: Organização e Representação da informação; Informação Musical; Instrumentos de Acesso à Informação.

1.Introduction

This article presents a literature review aimed at consolidating the knowledge on the state of the art about Organization and the Representation of Musical Information (ORMI) in Portugal, considering the different typologies of collections. The goal is to provide an overview of what led to elaborate the analyzed studies, what problems they seek to solve, how, and the

efficiency of their solutions. Thus, upcoming ORMI projects may use this knowledge to decide more clearly which approach to take.

In Brazil there is a prolific production on this subject, especially with articles by Lúcia Café and Camila Barros, who want to “show a qualitative and quantitative panorama of the studies on musical information at national and international level in the field of Information Organization” (2016: 107). However, in Portugal there are not many studies about the production of musical information organization and representation by Portuguese authors.

Nevertheless, there is a Portuguese line of studies that reviews the state of ORMI with two relevant contributions that date from 2005 and 2011. Therefore, this article will focus on documents that approach the ORMI after this later date. The year 2005 witnessed the presentation of the doctoral thesis of the musicologist João Pedro d’Alvarenga who, despite not studying ORMI, opens his musicological PhD thesis with the following statement:

“There is, I believe, no introduction or preface to a major historiographical work on music in Portugal that does not remarks both the frailty and the scarcity of basic musicological research in our country, benevolently explained by the ‘lack of a systematic synthetic reflection tradition’, which sustains the persistent ‘serious knowledge gaps’ in relation to certain historical-stylistic periods or to certain repertoires” (D’ALVARENGA, 2006: xi).

In 2011, the musicologists José Abreu and Paulo Estudante published an article that elaborates a historical review of the cataloging and inventorying of the national musical sources, noting a still very deficient situation:

“it is striking that in 2011 the Portuguese scientific community does not have a minimally accurate idea of the national musical heritage. At the beginning of the second decade of the 21st century, Portugal does not have a catalog (or even an inventory) of nationally curated musical sources, irrespective of the chronological period” (ABREU & ESTUDANTE, 2011: 81–82).

The *Diccionario Enciclopédico de Ciencias de la Documentación* defines Information Representation (IR) as a set of processes, both intellectual and technical, whereby “an intelligent entity - the representator or agent - extracts relevant information of a part of the reality - that is, the domain - and materializes it on another part of the outside world - called the field of

representation" (LOPEZ YEPES, 2004: 404). This information may be musical or not, depending on the definition of the *musical* adjective itself, as something "which refers to music" (*Musical*, 2019). A broad term is necessary to understand that the object of study of Musicology includes much more than just printed or recorded music. It is a multifaceted subject that needs a transdisciplinary view, and a non-lesser part of its information is only musical through a relation in the sense of Luciana Duranti's *archival bond* (1997), as an important source for the History of any music (of any ethnicity) that must be taken into account.

Taking this into account, the computerization issues of musical information representation has had a great technological development in the last decades. Thus some authors believe that, if the description tasks were only concerned with capturing the information in the documents to elaborate Finding Aids (in the form of guides, inventories and catalogs), the information and communication technologies (ICT) allowed to "dissociate the concept of description from the concept of search [... and] facilitate knowledge society users to retrieve, access and use information" (LLANES PADRÓN *et al.*, 2015: 4–5). These concerns can be noticed in the creation of technological direct responses to user demands of Music Information Retrieval such as *query by humming*, *search by sound*, *acoustic fingerprinting*, and others. Technologies that have many analogies with the response that Optical Characters Recognition give to user demands in electronic queries.

2. Methodology

A survey of monographs and papers post-2011 was carried out, since the article of Abreu and Estudante presents a review of the prior ORMI studies. We started this study with the following research question:

What problems and solutions have been addressed by academic works, between 2012 and 2019, regarding the Organization and Representation of Musical Information, in Portugal?

We set out from the meaning of Knowledge as one of the Janus-face, being the other Information, which characterizes the information society in practice. In order to answer this question, we chose the "Documentary analysis" method (BOWEN, 2009: 27, 29), which allowed us to obtain a solid description of a phenomenon (STAKE, 1995; YIN, 2010) starting with the identification, selection,

data collection and verification (research heuristics). It also allowed collecting interpretations in different written sources, in physical or digital formats, to give them meaning (hermeneutics of research), with the purpose of developing empirical knowledge (BOWEN, 2009: 27; CORBIN & STRAUSS, 2008). Thus, the documentary analysis presents itself as a method of “systematic and objective research, evaluation and synthesis of evidence in order to establish facts and draw conclusions” about events (BORG (1963) *apud* SOUSA, 2005: 88).

A search was carried out in several repositories, namely the RCAAP portal, an aggregator of the Open Access Scientific Repositories of Portugal (in Portuguese, *Repositório Científico de Acesso Aberto de Portugal*), and the Online Knowledge Library (B-On), which aggregates nationally commercial subscriptions with various scientific publishers. The terms “Catalog* AND music*” or “music*” were used, and the research focused on musical cataloging in Portuguese academic works after 2011, especially in the subject area of Information Science. The search was conducted on 23th March of 2019, obtaining a total of 88 results in B-On, and 66 results in RCAAP. From these results we excluded studies repetition in both databases, studies that focused solely on the Organization and Representation of Information and studies that focused solely on the Musical Information. Thus, a final *corpus* of 23 documents that focused on the ORMI was selected, according to an inductive qualitative analysis to assess if they focus ORMI as a scientific and technical approach. We identified in these studies the analytic categories to create afterwards a classification structure by disciplinary areas.

2.1. Finding Aids

This study positions the Heritage institutions – Archives, libraries, and museums - as information sources *per se*, as a place. Through this, it circumscribes to two types of information sources: The Finding Aids even when they integrate editions or studies of another nature, and the information accumulated in the places. They are instruments of mediation between real or potential users, and documentary information recorded on various physical media.

This is also an institutional mediation that places the archivist, librarian or museologist at the center of the mediation of the Heritage institution in the social sphere (SILVA & RIBEIRO, 2010: 83–84). Its role as mediator is present precisely in the Finding Aids - Guides, Inventories, Catalogs, online databases, among others. In them, users in growing numbers can create their own Finding Aids according to their needs. It is based on them that

the user makes choices, decides to read them, or excludes them from their research, and the quality of the classification frameworks that structure the organization of knowledge is crucial, as is the quality of descriptions, summaries and terms used in the natural or controlled language.

The main typologies of Finding Aids present in the final corpus of our research correspond to Catalogs and Inventories. But the instruments do not always relate to the typology and objective that the authors wish to fulfill.

3. Works of ORMI prior to 2011

As we have stated earlier, the most recent review of ORMI's history and state of art is the article *A propósito dos livros de polifonia impressa existentes na Biblioteca Geral da Universidade de Coimbra: uma homenagem ao musicólogo pioneiro Manuel Joaquim*, of José Abreu and Paulo Estudante (2011). It presents the cataloging of musical sources, especially before 1800, their entities and the dates of the works and the financial or human reasons of their incompleteness.

One of the main initiatives of this cataloging movement came from the Commission of Musicology of the Music Service of the Calouste Gulbenkian Foundation (FCG) (in Portuguese, *Fundação Calouste Gulbenkian*), created in 1958, with the scientific orientation of the musicologist Macário Santiago Kastner. The institutions where this philological work of musical sources was made were the archives of the key Portuguese cathedrals with the greatest musical activity, as well as the public libraries which obtained the assets of religious institutions in 1834, after the religious orders were extinguished in Portugal. The institutions list is the following:

- “- Biblioteca Pública de Braga,
- Arquivo da Sé de Viseu,
- Arquivo Distrital da Viseu,
- Arquivo da Sé de Lamego,
- Biblioteca Geral da Universidade de Coimbra,
- Arquivo da Sé de Évora,
- Arquivo Distrital de Évora,
- Biblioteca Pública de Évora,
- Academia de Ciências de Lisboa,
- Arquivo Musical da Fábrica da Sé Patriarcal de Lisboa,
- Biblioteca Nacional de Lisboa,

- Biblioteca do Palácio Nacional de Mafra,
- Biblioteca Pública Municipal do Porto,
- Biblioteca do Paço Ducal de Vila Viçosa” (ABREU & ESTUDANTE, 2011: 84).

The ambitious project that set out to inventory the musical heritage in fourteen institutions, resulted only in four published catalogs and some inventories (some partial) that became as internal documents in some archival fonds (ABREU & ESTUDANTE, 2011: 83).

But these initiatives were abandoned due to a general misconception that musicological science had concluded its philological phase. Abreu and Estudante state that in the mid '80s

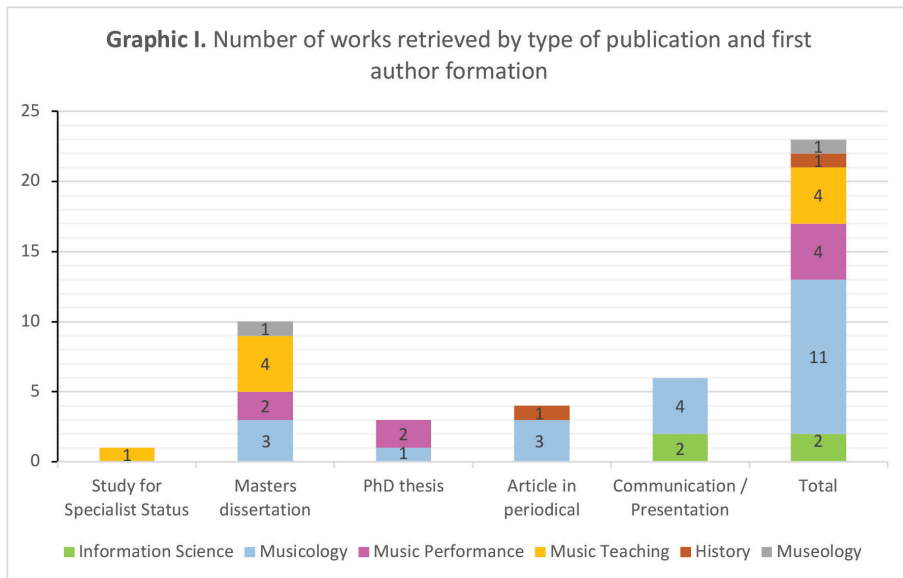
“The “philological phase” of the Portuguese Musicology is considered outdated and even gains a derogatory connotation”. And they did it to “answer to an international agenda with works of an interpretative or reflexive kind, without, however, having the real foundations of a deep knowledge of our archives (be it musical sources or documentary sources on musical institutions)” (ABREU & ESTUDANTE, 2011: 86).

Abreu and Estudante not only make an historical presentation of the philological treatment initiatives of musical holdings in Portugal, but they criticize this same state:

“In 2011, the Portuguese scientific community does not have a minimally accurate idea of the national musical heritage. At the beginning of the second decade of the 21st century, Portugal does not have a catalog (or even an inventory) of nationally kept, maintained, stored musical sources, whatever the chronological period considered” (ABREU & ESTUDANTE, 2011: 81–82).

4. Results and analysis

In our final corpus, the qualitative analysis concerning the formation of the first author reveals that the ORMI is found in authors of musicological formation (11), in musicians (4), music teachers (4), historians (1), museologists (1) and library and information scientists (1).



Source: Elaborated by the authors.

Graphic 1 shows that while in the area of music performance and teaching the works occur as a result of the final higher education studies, the majority of musicologists author's work are abstracts or communications or presentations supporting materials, in symposia or congresses.

A consideration of those catalogs made by musicologists showcases two works that share both the institution and the subject. The first is a paper published in a journal, made by José Abreu and Paulo Estudante, researchers at the Center for Classical and Humanistic Studies (CECH) (in Portuguese, *Centro de Estudos Clássicos e Humanísticos*) of the University of Coimbra. They both lead the project *Mundos e Fundos. Mundos Metodológico e Interpretativo dos Fundos Musicais* at the CECH, that focus on making a "survey of musical sources, their study and respective critical edition" (UCOIMBRA, 2018). The second document is Sara Dacal Crespo's master's dissertation, presented at the University of Coimbra and supervised by Abreu and Estudante.

Their brief description of the collection of printed books of the 16th and 17th centuries and tables with the works' catalog of the three typologies documents: choir books, part books and instrumental music books (ABREU & ESTUDANTE, 2011: 98–99), was continued with a narrower focus in the catalog presented in Sara Dacal's dissertation. Focusing only in the part books, Dacal's catalog followed a model published in 2009 by the musicologist Tess Knighton, with some modifications due to the particular characteristics of the collection (CRESPO, 2019: 59).

We were also able to find works that present catalogs of an institutions' musical collection and make them available in open access online databases. This way to disseminate results of research projects that perform cataloging and indexing tasks of musical works has shown to be relevant in the Finding Aids, since there is a greater tendency in its use to fulfill open science criteria. This is a direct consequence of the Portuguese integration in the "European Plan S" initiative promoted by Science Europe, in particular by establishing the principle that the results of research funded through public funds should be available in immediate open access" (FCT, 2018) by the Portuguese Ministry of Science, Technology and Higher Education and the Science and Technology Foundation (FCT) (in Portuguese, *Fundação para a Ciência e a Tecnologia*), through Council of Ministers Resolution No. 21/2016.

An example of that is Cátia Silva's master dissertation: a Report on the project *Arouca's Monastery Historical Collection - recovery and cataloging: report and case study*. It results from a partnership between the monastery's Royal Brotherhood of Queen Santa Mafalda (in Portuguese, *Real Irmandade da Rainha Santa Mafalda*), the Center for Studies in Sociology and Musical Aesthetics (CESEM) and the Institute of Ethnomusicology - Center for Studies in Music and Dance (INET - md). The projects design and coordination was aimed at the initiative *Recuperação, Tratamento e Organização de Arquivos Documentais* of FCG, whose objective is to "financially support institutions that somehow have in common the safeguarding and dissemination of cultural heritage" (SILVA, 2017: 21). From the project, a catalog was immediately available in a database located on the Universidade Nova de Lisboa's server and some sources are included in the Portuguese Early Music Database (FERREIRA *et al.*, 2010). The first database was created to contain the catalog of the collection consisting of "documents dating from the 13th and 20th centuries, which includes manuscripts, manuscript fragments, printed books (including incunabula), and various documents (periodicals, engravings, drawings and postcard albums)" (FERREIRA, 2016). But alas, we realized that this database does not include musical information about the sources, leaving the ORMI works only for the Portuguese Early Music Database: description and "indexing that allows the integration of *cantus* with other digital platforms, such as the Cantus Index and Cantus databases" (SILVA, 2017: 37), from the University of Waterloo.

However, catalogs also emerged from non-musicologist projects works, and this study was able to find a catalog presented by someone trained in Documentation and Information Science. Luísa Maria Marques, a librarian at the *Instituto Politécnico de Lisboa - Escola Superior de Teatro e Cinema*

(ESTC), presented it at a congress of the Portuguese Association of Librarians, Archivists and Documentalists (BAD) (in Portuguese, *Associação Portuguesa de Bibliotecários, Arquivistas, Profissionais da Informação e Documentação*):

“The conservation project supported by the Calouste Gulbenkian Foundation [that] allowed 812 of [Handwritten plays] (18th-19th centuries) to be digitized and all bibliographic information inserted in the online catalog of the ESTC Library, with full or partial access to the digital document” (MARQUES, 2016: 44).

This catalog is musically relevant considering that the music-theatrical spectacle, such as opera and “musical spectacles, of a serious or jocular sort, mostly translated and adapted to the Portuguese scene” (MARQUES, 2016: 46), abounded in this period.

Another musical information catalog is Ana Helena Jerónimo’s master dissertation on Heritage studies, in 2018. The author studies the private collection of Luís Canguero that was “accessible to the public in 2016, with its installation in the Mechanical Music Museum, built by the collector at its property in Arraiados, Palmela” (JERÓNIMO, 2018: iii). Ana Jerónimo, working in the area of museology, elaborates a Finding Aid that she calls an inventory because it gives an account of the existences of the collection, but the elaborated tool, taking into account the definition of the area of Documentation and Information Science, is a catalog because it makes a detailed description of each document.

Although limited by the impossibility of analyzing the whole collection due to its large size, it organizes the musical instruments by the different classes of parts of the target collection. These classes are grouped into two supercategories according to the inventory standards accompanying the *Programa Matrix* elaborated by the *Direção-Geral do Património Cultural* (JERÓNIMO, 2018: footnote 44). In addition, it also produces a catalog of the musical pieces reproduced by the automatophones, having identified “91 musical registers, of which 46 belong to operas and operettas” (JERÓNIMO, 2018: 109).

Finally, it is important to mention the eight recovered catalogues in works of master dissertations or doctoral theses in the area of music, in the area of expertise of interpretation or music education. We bring them together because there is a common idea through the various works: the desire to value the music of Portuguese composers. In the field of music education, this is done through the dissertations that intend to create a catalog for the teaching of musical instruments (ARAÚJO, 2018; MOREIRA, 2015; TOMÁS,

2016); the final higher education works of musicians intend to create a catalog of Portuguese music for their instruments (ALVES, 2015; FARIA, 2018). But it is in this works that we find a greater disparity in the quality and the fulfillment of the objective of creating an Finding Aid that allows a quick and easy query and retrieval (ALVES, 2015: 13) in response to a general feeling of “scarcity of bibliography and dispersion of information about Portuguese music that [concerning almost any instrument] hinders its knowledge and its dissemination” (ALVES, 2015: i).

In fact, this study finds that the musicians’ formation is lacking a methodological background for a scientific work, which can be one of the major issues for these problems. The key point of Information Access falls far short in works such as Joana Moreira’s, since there is a vast and undefined list of sources used to create the list of works with no association of each title to a specific source. Ana Araújo’s catalogue is also an example of those difficulties, since most of the works are in private collections.

4.1.Theoretic studies of ORMI

The subject of the ORMI is not confined to the contributions for the elaboration of Finding Aids. In fact, this study found a theoretical approach to this problem an interdisciplinary paper between Maria João Albuquerque, a “doctorate in Information Sciences, from the *Universidad Complutense de Madrid*, Integrated Researcher at *Instituto de Etnomusicologia - Centro de Estudos em Música e Dança* where she furthered studies in the field of information curation and in the area of musical documentation, namely on musical editing” (INET-md, 2018); and Helena Sofia Pinto and José Borbinha, who have developed relevant work in Information Science in the area of ontology and information management, respectively.

Their paper analyzes the “recently developed most significant music ontologies, in view to their possible reuse for creating an ontology” (ALBUQUERQUE, PINTO & BORBINHA, 2018: 2) applied to a project that aims to build a “database that gathers the results from research studies in musical archives” (ALBUQUERQUE, PINTO & BORBINHA, 2018: 2).

The authors’ state an “enormous structural and semantic heterogeneity in the representation of musical information in catalogs of libraries, archives and museums, in databases of universities and R & D centers, as well as databases containing digital musical information” (ALBUQUERQUE, PINTO & BORBINHA, 2018: 1), that highlights the importance of creating a

database that ensures a “flexible management of the concepts used in the representation of this domain and its relations, and subsequently allow its sharing with other databases” (ALBUQUERQUE, PINTO & BORBINHA, 2018: 1). As far as the authors are concerned, “as opposed to information schemas that typically define the structure of relational databases, information systems using ontologies in your knowledge base may have more flexibility” (ALBUQUERQUE, PINTO & BORBINHA, 2018: 1–2) allowing interoperability between databases.

But the problem of the organization of this type of information is related to the very nature of the Musical Work, and that an unlimited set of Expressions can “coexist for the same Work, such as Variations, Arrangements, Transcriptions, Orchestrations, etc., which can be described differently” (ALBUQUERQUE, PINTO & BORBINHA, 2018: 2), besides the performances and their records, “which can lead to the construction of several Expressions” (ALBUQUERQUE, PINTO & BORBINHA, 2018: 2).

Thus, Albuquerque *et alia* make brief considerations about the musical work in FRBR (*Functional Requirements for Bibliographic Records*), in RISM (*Répertoire International des Sources Musicales*) and BIBFRAME of the Library of Congress, and they state:

“While standards promoting organizations for the bibliographic description of music, such as IFLA or RISM, or the IAML (International Association of Music Libraries, Archives and Documentation Centers) seek to find solutions that guarantee homogeneity in the description of musical content information, the same can be said of the various projects that have emerged under the name of Music Information Retrieval (MIR), and Music Data Mining (MDM), some published by International Society Music Information Retrieval, seeking to develop tools and apply automatic techniques for retrieving musical information” (2018: 3).

But the paper is particularly interesting for the profound analysis it presents concerning four ontologies:

“The (1) **Musical Ontology framework** uses the ontologies *Event* e *FRBR*, which can be used to describe the relationship between the Creator and the Work.

BNF developed the ontology (2) **DOREMUS**, based on the model FRBRoo and the CIDOC-CRM, in which the notion of event is central

and where the concept of *Complex Work* is fundamental for the description of the various creative agents of the musical work.

(3) **MusicNote Ontology** uses a hierarchical organization of the score constituent elements, proposing an analytical model of the digital scores.

Finally, the (4) **Performed Music Ontology** intends to be an extension of the BIBFRAME model, introducing the concept of Performance Medium, which distinguishes the original work from the interpreted version, two fundamental concepts to define the various creative subjects of musical work” (ALBUQUERQUE, PINTO & BORBINHA, 2018: 9).

Conclusion

As this study expected, the standard and guidelines basis for the ORMI are not shortcoming. In fact, one of the main issues is clearly the semantic and structural heterogeneity that still endures in the ORMI works. Since the majority of catalogs and databases are being produced by musicology projects financed by the Portuguese FCT, their specific criteria of musicological knowledge continue to impel them to structures that respond to their information representation needs. The Portuguese Early Music database is a clear case of this need to represent relevant early music information. And although it is a structure that communicates with the Cantus Index and Cantus databases from the University of Waterloo (SILVA, 2017: 37), which is also powered by other eight early music databases, these ontologies do not correspond, nor pretend to communicate, to a LIS language.

Although these issues are not consensual within the scope of Information Science, works such as the one of Maria João Albuquerque *et alia* show that in Portugal there is ongoing research and reflection concerning the standards and methodologies to be adopted. However, it is not foreseen to emerge in the near future a standard that will respond to the needs of ORMI of each music epoque or genre, resulting often in adaptations of existing ontology structures to their musical information (ALBUQUERQUE, PINTO & BORBINHA, 2018), or the creations of new ones (FERREIRA *et al.*, 2010), or the ongoing adaptation of the music information to existing LIS ontology structures (ASSUNÇÃO, 2005: 144).

As one may expect, some of these online database works (SILVA, 2017: 21) that result from projects financed for a limited time may have

the risk of not having a digital preservation plan (VOUTSSAS M., 2013: 108) and, being born-digital databases, the Finding Aids can disappear along the website if there is no more funding to support a paid database server.

It is further understandable that Heritage institutions already have a policy of ORMI, even if their policy is not to follow any controlled language or norms, and to change that policy would most certainly result in a system entropy. But while there is research within the field of Documentation and Information Science trying to increase the interoperability between the standardized structures, there are many who, without training in the field, are making efforts to organize and disseminate musical information in a way that Abreu and Estudante classify as “isolated impulses over the last few decades being essentially the work of a single person” (2011: 118). Examples of this are the works of most musicians and music teachers which do not result in the change of the curricula of the conservatories in Portugal, nor in changes of higher education’s repertoire for admission auditions in music studies, nor in catalogs with easy access to musical pieces originated from Portuguese authors for a certain musical instrument.

On the other hand, the Finding Aids developed by the research projects in Musicology R & D Centers demonstrates the concern to use correct documentary languages, although the state of art denotes that there is still a long way to go towards the interdisciplinarity between Information Science and Musicology. Still, the next steps to improve the situation of ORMI in Portugal must necessarily be made through an interdisciplinary path in both directions: the inclusion of LIS scientists in musicological projects that help determine which Finding Aids to elaborate and how, and the consultation of musicologists’ expertise of musical language and knowledge description tools by the librarians, archivists and museologists in Portugal.

While doing so, it is possible that the future of musical documentary languages will continue to go through a heterogeneous path due to an amalgamate of circumstances. One could see this path much like the computer programming languages’ path: the creation of languages that allow a technical response to solve a list of problems (HOPPER, 1978: 10–11), the adaptation of former languages to solve a new lists of problems (counting with the technological development) (MAHONEY, 1996: 775–776), the emergence of both general-purpose and domain-specific oriented languages, and, probably the most important, the result of a language’s marketing allowing it to thrive or not in the society (MAHONEY, 1996: 775–776).

Bibliography

- ABREU, José; ESTUDANTE, Paulo (2011) — A propósito dos livros de polifonia impressa existentes na Biblioteca Geral da Universidade de Coimbra: uma homenagem ao musicólogo pioneiro Manuel Joaquim. *Revista de História das Ideias*. 32, p. 81–130. doi: 10.14195/2183-8925_32_3.
- ALBUQUERQUE, M. J.; PINTO, H. S.; BORBINHA, J. (2018) — A heterogeneidade na representação da informação musical: proposta de uma ontologia para a música. *13o Congresso Nacional BAD*.
- ALVES, Nelson (2015) — *35 anos de composição para oboé em Portugal (1980-2014): levantamento e caracterização das obras*. Porto : [s. n.] (dissertação de mestrado em Música - Interpretação Artística, Especialização - Oboé apresentada ao Instituto Politécnico do Porto).
- ARAÚJO, Ana (2018) — *Repertório de Música Portuguesa para violoncelo para o ensino básico e secundário: inventário e adequação ao nível de ensino*. Castelo Branco : [s. n.] (dissertação de mestrado em Ensino de Música – Instrumento Violoncelo e Música de Conjunto apresentada ao Instituto Politécnico de Castelo Branco).
- ASSUNÇÃO, Maria Clara Rabanal Da Silva (2005) — *Catálogo de documentos musicais escritos: uma abordagem à luz da evolução normativa*. Évora : [s. n.] (dissertação de mestrado em Ciências Documentais apresentada à Universidade de Évora).
- BOWEN, G. A. (2009) — Document analysis as a qualitative research method. *Qualitative Research Journal*. 9, 2, p. 27–40. doi: 10.3316/QRJ0902027.
- CAFÉ, Lúcia Maria Arruda; BARROS, Camila Monteiro DE (2016) — Panorama da produção nacional e internacional sobre informação musical. *Informação & Sociedade: Estudos*. 26, 2, p. 107–119.
- CORBIN, J.; STRAUSS, A. (2008) — *Basics of qualitative research: Techniques and procedures for developing grounded theory*. Thousand Oaks, CA : Sage.
- CRESCO, Sara Dacal (2019) — *A música impressa do fundo da Biblioteca Geral da universidade de Coimbra. Catálogo dos livros de partes do séc. XVI*. Coimbra : [s. n.] (dissertação de mestrado em Estudos Artísticos apresentada à Universidade de Coimbra).
- D'ALVARENGA, João Pedro (2006) — *Polifonia portuguesa sacra tardo-quincentista : estudo de fontes e edição crítica do Livro de São Vicente , manuscrito P – Lf FSVL 1P / H-6*. Évora : [s. n.] (tese de doutoramento em Música e Musicologia apresentada à Universidade de Évora).
- DURANTI, Luciana (1997) — The Archival Bond. *Archives and Museum Informatics*. 11, p. 213–218.
- FARIA, Vasco Silva De (2018) — *Repertório para trompete em Portugal de 1980 a 2010: Três Estudos de Caso*. Évora : [s. n.] (tese de doutoramento em Música e Musicologia apresentada à Universidade de Évora).
- FCT (2018) — *Posição de Portugal e da FCT em relação ao Plano S*. Disponível em <URL:https://www.fct.pt/noticias/index.phtml.pt?id=372&/2018/10/Posição_de_Portugal_e_da_FCT_em_relação_ao_Plano_S> (acedido em 08/06/2019).
- FERREIRA, Manuel Pedro et al. (2010) - *Home*. Disponível em <URL:http://pemdatabase.eu/> (acedido em 08/06/2019).

- FERREIRA, Manuel Pedro (2016) — *Home*. Disponível em <URL: <http://arouca.fcsh.unl.pt/>> (acedido em 02/06/2019).
- HOPPER, Grace Murray (1978) — The opening session. *History of Programming Languages*. Los Angeles : Academic Press, Inc.
- INET-MD (2018) — *Maria João Albuquerque*. Disponível em <URL: <http://www.inetmd.pt/index.php/pessoas/integrados/52-maria-joao-duraes-albuquerque>> (acedido em 20/06/2019).
- JERÓNIMO, Ana Helena Marques Peixoto (2018) — *Coleção Luís Cangueiro: da esfera privada ao Museu da Música Mecânica: contributos para um estudo*. Lisboa : [s. n.] (tese de mestrado em Estudos do Património apresentada à Universidade Aberta).
- LLANES PADRÓN, Dunia et al. (2015) — Complexidade da representação da informação arquivística. *Epistemología de las Ciencias de la Información y Documentación*. Madrid. Disponível em <URL: http://edicic2015.org.es/ucmdocs/actas/art/394-LLanes_Complexidade-da-representacao-da-informacao-arquivistica.pdf> (acedido em 02/06/2019).
- LOPEZ YEPES, José (2004) — *Diccionario enciclopédico de ciencias de la documentación*. [S.l.] : Editorial Síntesis.
- MAHONEY, Micheal S. (1996) — Issues in the History of computing. *History of Programming Languages-II*. New York : ACM Press.
- MARQUES, Luísa (2016) — Peças de teatro manuscritas (séculos XVIII e XIX) em acesso aberto da Escola Superior de Teatro e Cinema: projeto apoiado pela Fundação Calouste Gulbenkian. *Cadernos BAD: revista da Associação Portuguesa de Bibliotecários, Arquivistas e Documentalistas*. 2, p. 44–56.
- MOREIRA, Joana Maria Sousa (2015) — *Catálogo de obras de música contemporânea portuguesa para piano: uma proposta de revisão didática no curso secundário do ensino artístico especializado*. Lisboa : [s. n.] (tese de mestrado em Ensino da Música apresentada à Universidade Católica Portuguesa).
- s.a. (2019) — Musical. *Dicionário infopédia da Língua Portuguesa*. Disponível em <URL: <https://www.infopedia.pt/dicionarios/lingua-portuguesa/musical>> (acedido em 29/06/2019).
- SILVA, Armando Malheiro Da; RIBEIRO, Fernanda (2010) — *Recursos de Informação: serviços e utilizadores*. Lisboa : Universidade Aberta.
- SILVA, Cátia (2017) — *Projeto Acervo Histórico do Mosteiro de Arouca - recuperação e catalogação: relatório e estudo de caso*. Lisboa : [s. n.] (tese de mestrado em Ciências Musicais apresentada à Universidade Nova de Lisboa).
- SOUSA, A. B. (2005) — *Investigação em educação*. Lisboa : Livros Horizonte.
- STAKE, R. (1995) — *The art of case study research*. Thousand Oaks, CA : Sage.
- TOMÁS, A. C. (2016) — *Elaboração de um catálogo de canções para jovens cantores*. Lisboa : [s. n.] (tese de mestrado em Ensino da Música apresentada ao Instituto Politécnico de Lisboa).
- UCOIMBRA (2018) — *Mundos e Fundos*. Disponível em <URL: <https://www.uc.pt/fluc/artisticos/investigacao/mef>> (acedido em 13/06/2019).
- VOUTSSAS M., Juan (2013) — *Cómo preservar mi patrimonio digital personal*. Mexico : UNAM, Instituto de Investigaciones Bibliotecológicas y de la Información.
- YIN, R. (2010) — *Estudo de caso: planejamento e métodos*. Porto Alegre : Bookman.