Theory of Classification and Classification in Libraries and Archives: Convergences and Divergences

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Abstract: Classification structures and systems are privileged resources for knowledge organization. Given this statement, the paper presented here refers to a study developed in the information representation and organization field, dedicated to the theory of classification, in general, and to the classification in libraries and archives, in particular. In this endeavor, we adopted an exploratory approach, performing a selective literature review of the subject, presenting and discussing theoretical and empirical considerations focused on backgrounds, influences, definitions, purposes, relevance, principles and characteristics of bibliographic and archives classifications, in order to identify points of convergence and/or divergence between them, thus contributing to a better understanding and application in a contemporary sense. Following this theoretical framework, we performed a comparative analysis of the relevant aspects of the mentioned classifications, having reached the following considerations: the two types of knowledge classifications considered have some points of convergence; in general aspects, regarding their backgrounds, influences, definitions, purposes and relevance; however, in what regards specific aspects, such as the principles that govern them and their characteristics, they show differences which, in our opinion, are caused mainly by the specific characteristics of their objects, as well as by the constraints of their own context.

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1.0 Introduction

In the last hundred and fifty years, classifications have been identified as primary resources used in information and knowledge organization processes. This paper presents a study developed under the representation and organization information field, and devoted to the classification theory, in general, and bibliographic classifications and archives classifications, in particular. Taking into account that classifications constitute themselves as knowledge organizational systems and structures, suitable to adapt to the challenges and to the opportunities posed by the digital age, it is important to present and discuss some theoretical considerations focused on them.

Although the bibliographic and archives classifications are related to a broad conceptual field, which is the theory of classification, we do not intend to put forward an exhaustive discussion on this subject. Nevertheless, in our opinion, it is important to trace the conceptual outline where these classifications are both integrated, in order to analyze them, individually, taking as a reference, on the one hand, its own scientific field or discipline and, on the other, its evolution in the last hundred and fifty years.

Following this statement, we will adopt an exploratory approach, performing a brief literature review of the general theory of classification, drawing a short explanation about some aspects considered relevant in the comprehension of the object of this paper. Thereafter, we will provide an analysis of some aspects of the bibliographic and archives classifications, in particular, presenting and discussing some theoretical considerations, focusing, especially, on foundations, definitions, principles, purposes and trends in order to highlight its points of convergence and divergence, contributing to a better understanding of these well-known systems.

2.0 Bibliographic classifications

The traditional bibliographic classifications—*Dewey Decimal Classification*, Library of Congress *Classification*, Universal Decimal Classification, *Bliss Bibliographic Classification* and *Colon Classification*—emerged in the second half of the nineteenth and early twentieth centuries. They resulted from the lack of a tool that would allow the organization of the documents by subject on the shelves. As Hjørland points out (2013, 173) classifications have different bases, which partly reflect different epistemologies. They can be based on logic, on empirical studies, on human conventions, on heritage, on purpose or on a mixture of criteria (for instance, combined logical, empirical, historicist, and pragmatic criteria). In any case, in spite of the different epistemologies and of displaying different structures, they had their bases rooted in philosophical foundations.

In the etymological sense, classification is a term that comes from the Greek *clasis*, which was Latinized to *classis*, a noun used to describe something which is conferred according to criteria established *a priori* (Quicherat 1927, 231). To Houaiss and Vilar (2002-2003, 231), dating back to ancient Rome, the term "class" refers to one of the categories in which citizens were divided, based on the criterion of affluence; to the Portuguese Language Dictionary of the Academy of Sciences (2001, 837), the term classification is the "action of distributing in classes, by categories ... according to precise criteria." Faria and Pericão (2008, 258) define classification as a "group of ordered concepts, distributed systematically in classes, forming a structure" and as a "structuring of concepts into classes and subdivisions to express the existing semantic relationships between them," and for the standard ISO 5127-6 (1988, 93), a classification system is an "indexing language intended for a structured representation of documents or data, through the use of indexes and corresponding terms, in order to allow systematic access, resorting to an alphabetical index, if necessary."

According to these lexicons, and depending on the point of view, classification is the product that results from the act of classifying and, simultaneously, is the tool used to carry out the classification process. In the same way, classifying is the process that gives rise to a structured plan, and classification is the device by which construction is taken usually, but not only, *a priori*. Beyond these definitions, we understand bibliographic classification as a scheme which consists of numeric or alphanumeric codes (notations), controlled and structured, representing concepts, usually systematized from the general to the particular. These codes assume a dual function: they serve to represent the information by themes and to retrieve information, the first and last goal of a classification (Rodríguez-Bravo 2011, 156).

Bibliographic classifications were earlier influenced by the principles of classifications of philosophers and the classifications of naturalists, and their foundations are related to such well-known principles as the Aristotelian-Thomistic and the rationalists and empiricists of the eighteenth century (Aranalde 2009). The Aristotelian ideas of genera, species, specific difference, comprehension and extension, developed by his disciple Porfirio, are implicit in the genesis and development of classes, especially regarding to the classifications which organize their elements displaying levels of dependency with one another, e.g., the *Dewey Decimal Classification* and the Universal Decimal Classification. The genera correspond to the class, to the extent that they gather a set of subjects with affinity with each other, these depending on a common branch. The species correspond to the subclass, which also brings together a set of subjects with common char-

acteristics, denoting a degree of specificity with each other higher than the classes' components. When applying the specific difference to the species, it will subdivide itself into another species. This will happen as many times as the procedure is performed. This is how the classes and subclasses are made up, by establishing the relation-process between genus-species and specific difference.

The Aristotelian notions of extension and comprehension are responsible for the conceptual dynamics observed in the classes. In a classification presenting hierarchical characteristics, the internal structure of classes is organized from the level of greater extension to the lowest of comprehension, from the general to the particular. This occurs due to the fact that these two concepts operate in reverse. Thus, a higher level extension matches a lower level of comprehension. Based on this reasoning, we may deduce that all subclasses which depend on a class correspond to its extension, while the subjects that make up each of the subclasses or divisions match their comprehension; and, that a high level of extension corresponds to a high level of conceptual abstraction (class), and that a high level of comprehension corresponds to a high level of specificity (subclass and divisions). Another aspect to keep in mind in the Aristotelian philosophy is related to the notion of category, which formed the basis of other classification systems, e.g., the *Colon Classification*.

The principles of the empirical-rationalist philosophy, as mentioned earlier, are also marked in the structure of the first bibliographic classifications. Francis Bacon (1645), for example, classified the sciences in three different intellectual faculties: memory, imagination and reason. Other experimentalist philosophy followers, e.g., natural philosophers of the eighteenth century, also had influence on the creation of these classification systems. Their systems, made to classify living beings and forms, were based on the idea of hierarchy, exhaustiveness and uniqueness. In this sense, the idea of exhaustiveness or completeness that the naturalist Linnaeus (see the "*Systema Naturae [...per regna tria naturae:secundum classes, ordines, genera, species, cum characteribus, differentiis, synonymis, locis.]*") considered in the description of the life forms is remarkable, and is also shown in the exhaustiveness with which the subjects are registered in each class, subclass and division in some classifications, mainly in the enumerative type. If we articulate this principle with the exclusivity, the classes are presented as a real taxonomy. Likewise, the principles of rationalist philosophy influenced the creation of bibliographic classifications, especially those organized in hierarchical classes, which have elements that establish qualitative relations, among themselves, based on their own characteristics, which, in this case, relate to the affinity. The arrangement of these elements is made according to a logical-deductive reasoning, from the general to the particular.

Summarizing all the ideas above (Simões 2011), the core of traditional bibliographic classifications involves, at least, the well-known following principles: hierarchy; exclusivity; and exhaustiveness or completeness. In addition, classification process aims at organizing information and knowledge, consistently, based on criteria of similarity and dissimilarity, in order to connect and separate objects, arranging them into categories or classes, according to functional qualities. In this sense, Tennis (2015, 245) said: "Classification and classification schemes can be narrowly or broadly defined. Broadly, classification is the identification of concepts and relationship between concepts. Narrowly, and for the purposes of subject-based retrieval of books, classification is a mutually exclusive, jointly exhaustive, hierarchically, and systematically ordered set of classes."

One of the main purposes of bibliographic classifications (Gil Urdiciain 2004) is to organize the physical and abstract objects into broad categories or classes, preventing the phenomenon of knowledge dispersion and promoting their organization and control. So, given the way in which objects are distributed, classifications are suitable to create some points of reference that allow the human being to be guided, without major disruption, whether in physical space, or in abstract space (Simões 2008, 73-74). In addition, the classifications are used for a systematic organization of information and knowledge, intending to make them available, so that users may access them in a pertinent and prompt manner. From this point of view, in our opinion, classifications fulfill their most important goal: to be a methodological resource for both intellectual and physical organization, and representation of information and knowledge, by themes, in order to promote effective and efficient retrieval.

Therefore, for nearly a century and a half, categorical languages were still regarded as one of the most used instruments in the representation of information and, thus, in the organization of knowledge in libraries. During this period, they continued gradually adapting themselves to the demands which occurred in the mindsets, as well as to the requirements brought about by the new technological paradigm, from the mid-twentieth century onwards. This change, remarkable in their contents and in their structure, did not change their basic function of representing by subjects and promoting information retrieval.

In the digital age, in which the Internet is presented as a bulwark, we should not lose sight of the role of classifications. Contrary to what happened for decades, when its main goal was to physically organize knowledge on shelves, with a view to speedy location, today, in addition to this possibility, bibliographic classifications allow us to find the information that is in full text in the digital environment, becoming cardinal points of information access. As the software created to answer the questions raised in the or-

ganization of knowledge, also bibliographic classifications are structures dynamic and flexible enough to play this role. In this sense, bibliographic classifications remain as benchmarks in representation and organization of knowledge, and, in extension, in retrieval and production of new knowledge.

3.0 Archives classifications

Traditional archives classification theory has followed the evolution of the archival principles and techniques that were successively consolidated, reinforced, modernized and questioned in the last hundred and fifty years (Ridener 2009). Nevertheless, before the consolidation of their own principles and methodologies, archives were strongly influenced by classification models commonly based on content and on geographic, chronological and onomastic criteria, among others (Müller, Feith and Fruin 1940; Jenkinson 1965; Schellenberg 1956; Heredia Herrera 1991; Sousa 2007). This state began to change after the publication of the well-known and classic *Manual for the Arrangement and Description of Archives*, first edited in 1898 by Müller, Fruin and Feith, in which the authors provided a basis for a theoretical and a conceptual framework to archives and archivists. Traditionally, from this point on, emerged the bases upon which would stand, in the course of the twentieth century and especially around the fifties and sixties, the modern archival science theories and methodologies (Jenkinson 1965; Schellenberg 1956; Fredriksson 2003; Ridener 2009).

In the archives' lexicon, among other notions, "classification" or "arrangement" (Müller, Feith and Fruin 1940; Schellenberg 1956) is a term that may suggest at least two different concepts or perspectives. It can be the operation that consists of the development and implementation of a filing plan or a classification scheme for archival items, holdings and collections (NP 4041 2005; Brazilian Dictionary of Archival Terminology 2005), as well as the process of organizing records respecting their provenance and original order, protecting their context and achieving physical and intellectual control (InterPares Glossary 2002, endorsed by the Glossary of the Society of American Archivists, compiled by Pearce-Moses 2005), or the process of systematic identification and organization of activities and records into logical classes, according to structured conventions, as well as methods and rules presented in a classification system (ISO 15489-1 2001). According to this tradition, classification is an action or process (operation, organization) that is based on, or resulting in a product (plan, structure, scheme). And because the classifications are traditionally based on the principles of provenance and original order they must represent structures, functions and activities, not forgetting the "archival bond" (Duranti 1997), or the relationship that links each record to the previous, the subsequent and to all those linked to the same activity (Pearce-Moses 2005).

All these statements have consequences for the way we traditionally lead the classification process in archives over the twentieth century. While provenance connects records to their creator, the original order thereof reveals the creation and accumulation relationships between records over time, and that is nothing more than the archival bond principle explicitly (Duranti 1997). And, as we can easily notice, both principles are strongly required in order to attest the authenticity and the reliability of records maintained in recordkeeping systems (Macneil 1998; Duranti 1995; Bearman 1992; International Council on Archives-ICA 1997). Nevertheless, to preserve these connections between records over time, it is also critical to keep them together, in their own context of creation and accumulation over time. Because records are evidence of the functions, activities and transactions related to their creator (Duranti 1995; ICA 1997; ISO 15489-1 2001), they must be kept in the same context in which they are created and used. So that is why the records must be, above all, organized, described and preserved together, for the time that they were required, in their original order and aggregation (ICA 1997; ISO 15489-1 2001).

Consequently, for the archives classification scheme depending on its orientation (organic, functional or both) and provenance, other criteria such as the organic structure or the functions developed by the records' creator will dictate the establishment of the higher levels of the plan. In the lower levels, however, original order will play an important role, besides other criteria, such as the activities and transactions in which the functions are detached, and even the conservation reasons, e.g., in those cases in which, within the same aggregation, some records must be kept together or, on the contrary, separated, depending on the retention period that was previously assigned in a retention schedule. These pragmatic criteria and theoretical principles help us in understanding schemes commonly based on notions such as

class → subclass → aggregations → records,

in a more recent terminology; or, in opposition, on

groups → sub-groups → series → items,

as they were known in modern archival theory.

Summarizing, in the boundaries of archival theory and methodology, the classifying process should be based, above of all, on provenance and original order, simply be-

cause these two principles are suitable to put records in context. Although it is recognized that there are many different ways to organize records in archives, among which are included subject classifications, it is widely argued that, if archives classification systems must reflect the genuineness of the process of creation and accumulation of records, i.e., the archival bond, the use of these so called "artificial" systems should be avoided, because given their tendency to apriori designs, they were not designed to achieve this goal (Müller, Feith and Fruin 1940; Jenkinson 1965; Schellenberg 1956; Bearman and Lytle 1985; Bearman 1993; Duranti 1995; ICA 1997; ISO 15489-1 2001). Therefore, to meet this challenge, the classifications in archives are held in accordance with organic and functional requirements, which, among others, are suitable enough to lead the records' creator to a compliant recordkeeping system. At this point, it is clear that the archives classification process is straightforwardly related to but not necessarily included in the methodological process of archival description. Such false "schism" is given by the different moments, needs and purposes that, according to modern archival theory, both procedures were traditionally carried out in archives.

It is not our purpose to stress this topic, but it is well-known that archival core tasks and labor can be divided into the following traditional archival functions: creation, acquisition, classification, appraisal, description, preservation and access (Schellenberg 1956; Rousseau and Couture 1998; Society of American Archivists - SAA 2016). Due to the juridical, legal and administrative value associated with the records, the classifications usually carried out in archives are primarily focused on information management. As we have stressed, they are suitable to give us a clear vision of the context in which documents are gathered, of their creators and their functions, activities and transactions, as well as their place within a specific structure. Unfortunately, they are unsuitable in providing us with much information about the content of the records. In fact, from this point of view, they probably will fail in providing users with tools for helping them in their information retrieval purposes. Because of that, this particular task will have to be addressed in the course of archival description process.

As we know, the multilevel process of describing records and aggregations involves the gathering of a lot of information about context, content and structure (ICA 1997; Bearman 2006; Hedstrom 1993). Many of these "pieces" of information, as we noticed above, can be provided during the classification process. However, the problem posed nowadays is that the description process traditionally developed in archives is not good enough in helping users in their information tasks and needs. This point of view has been stressed by different authors at different moments. The common argument seems to be that users quite often do not understand the sophisticated and not so user-friendly finding aids tools provided by archivists, based more on the context (provenance) and less on the contents (subjects) of the records. The user does not recognize these tortuous and unfavorable logical schemes (Bearman 1993; Horsman 2002; Daniels and Yakel 2010; Theimer 2011; Gnoli 2014). So, in order to obtain that desired intellectual control about records, archivists are failing in accomplishing their proactive duty (in a postmodern and post-custodial sense), that is give and increase access to records (Menne-Haritz 2001; Horsman 2002). So, as Gnoli (2014, 132) has posed: "due to this, the access is not increased or achieved. A greater investment in subject indexing, especially by synthetic systems allowing to cite several phenomena referred to in a single document, would clearly help researchers."

In fact, all these questions (Ridener 2009) are on the agenda of the archives, from 1990s to the present. They are very often envisioned (Freitas 2009) as challenges and opportunities for change. One of the solutions identified is to supply archives and archivists with more effective and efficient descriptive resources focused on the documents. So, as concluded by Henttonen (2014, 461) "subject headings in bibliographic descriptions might work as access points to archival materials, in some cases at least. However, the approach requires more studies and it is at the moment very far from a practical application."

Summarizing, when considering the contemporary context in which electronic records become increasingly numerous in archives, and responsibilities fall increasingly on the shoulders of their creators (see, for example, the notions of the distributed custody and the records continuum model), we become aware of the advantages offered by the early coordination between the process of classification and description, in which we include the use of controlled vocabularies to index documents by subjects allied to authority control, in order to provide consistent, normalized and authorized access points to the documents, increasing the possibilities of information retrieval in recordkeeping systems. This effort is required if we consider that nowadays, without an effective classifying system, we may neither put the records in context, nor describe them in a conventional and standardized way.

Finally, we would not forget that, from the record management perspective, the classification process is the basis of administrative effectiveness and efficiency, playing a relevant role in information and knowledge management (in which are included the organization and control tasks). Nowadays, in a context in which the citizen claims rights in society, classification work among other archival responsibilities should be assumed as a duty to be included on the agenda of records managers and archivists.

4.0 Discussion and conclusion

Accordingly, in this section we intend to present and discuss brief considerations focused on some of the relevant aspects observed with regard to foundations, definitions, principles, purposes and trends of bibliographic and archival classification in order to highlight some points of convergence and divergence. The main results are summarized at the end of this text (Appendix I).

4.1 Foundations and principles

Bibliographic classifications as products were created in libraries in the second half of the nineteenth and early twentieth centuries under the influence of classifications made by philosophers and naturalists, a common practice in the eighteenth and nineteenth centuries. They brought together pragmatic principles and philosophy upon which the structure of empirical support would be based. Thus the foundations of classification are linked to Aristotelian-Thomist and rationalist-empiricist principles and to other classifications built to classify essentially living forms and beings, and are based on three pillars: hierarchy, exhaustiveness and uniqueness. Therefore, in comparative terms we may say that, in general, the classifications made in archives and libraries are historically rooted and were based on the philosophical assumptions that gave rise to the classification instruments brought about beforehand.

In the traditional bibliographic classifications, Aristotelian ideas of genera, species, specific difference, comprehension and extension are highly relevant to support the entire construction process of the classes. In addition, the principles of affinity, hierarchy, exhaustiveness and uniqueness, derived from the empirical-rationalist philosophy and translated to the general theory of classification, are also present, in a very obvious way, in this type of classification. In archives, however, even though the ideas of the general theory are not at all excluded from the process of class construction, classifications should be carried out based on provenance and original order, which represent, respectively, the context and the sequence of creation and accumulation of the records. Therefore, the classifications built by subject (as a criterion), which generally are based on *a priori*-schemes, shall be limited to reference records in the archives.

In bibliographic classifications, we perceive the conceptual dynamic to be the hierarchical and internal structure of classes, organized from the level of greater to lesser extent. Finally, logical-deductive reasoning from the general to the particular prints its structural feature. Classifications made in archives, in their turn, given the need to reflect both the organic and functional aspects of the creator as the bonds that link the records with themselves, revealing their internal relationships, are schemes frequently carried out *a posteriori,* and being also supported by the inductive method of reasoning.

However, in other aspects of the general theory of classification we find points of convergence between the analyzed classifications. In both classifications made by libraries as well as those made by archives, and for a logical reason, we see the possibility of applying the following empirical-rationalist's principles: affinity, hierarchy, uniqueness, exclusivity and exhaustiveness or completeness. Additionally, we highlight other convergences: the use of similarity and dissimilarity criteria to join and separate objects, organizing them into categories or classes; the existence of relationship and selection, two epistemological dimensions inherent in the process; the fact that the selection process is conditioned by the context and is done on the basis of goals, leading the classifying act to different results; the dual aspects of the process of classification:, analytic and synthetic; the materialization in plans or classification schemes; the fact that classification schemes are not governed by the principles of exhaustiveness and exclusivity, at the same time; the fact that classifications are considered dynamic and flexible models, susceptible to change, to fulfill a greater purpose in order to organize information, and knowledge, when appropriately modeled.

4.2 Definitions

Bibliographic classifications are schemes that consist of numeric or alphanumeric codes, controlled and structured, representing concepts. Archival classifications also consist of numeric or alphanumeric codes, controlled and structured, but not necessarily representing concepts, but rather organic structures, functions, and activities in which records are involved. In both types of classification the definitions explored reveal at least two different dimensions: classification as a process (classify) and classification as a product (classification system, structure, plan and schema).

4.3 Purposes and trends

Classifications made in libraries and in archives arose from an empirical and pragmatic need: the lack of an instrument that would allow the organization of documents (and, thereafter, organization of information and knowledge). In the case of libraries, classification is a means for the organization of information and knowledge, as well as the individual arrangement of items on the shelves, taking into account subjects, i.e., contents.

In the case of archives, classification is also a means for the organization of information and knowledge, but it enhances primarily the context of production and accumula-

tion of records, dictated by the functions, activities and organizational structure of the creator. Moreover, the records are not usually handled or housed as items, but as groups, and kept together as such.

Whereas classification is a means, it must also have a goal such that, in libraries, it will aim to contribute to the efficiency and effectiveness of information retrieval. In archives, they have been traditionally been related to organization and control, in order to obtain efficacy and efficiency in managing records. So, in both cases, there are similarities in the intellectual and physical processes that give rise to the organization of information and knowledge, although the primary purpose to be achieved in each case is not very different (retrieval vs. management). Besides this, bibliographic and archival classifications have in common that they were created to arrange documents, among themselves and on the shelves, which is motivated by their empirical inclination. Thus, while bibliographic classifications represent contents, for knowledge organization in large epistemological frameworks as well as its retrieval, classification in the archives, in its turn, gives us a view of the records' production environment, their agents, their activities and actions as well as their grouping within a certain structure, promoting the control by their own institutions and reaching the goal of information organization and management, leaving their representation effectively in the hands of description and access.

Bibliographic classifications meet the challenge of organization and representation of information and knowledge on the Internet, allied to other systems and structures such as taxonomies. The challenges and opportunities posed to archives by the digital age meet in classification and description, and we can summarize them as follows: item level content description, giving and increasing access and promoting accountability, governance and transparence, and more effectiveness in information retrieval.

With regard to the application of these instruments, we find that, in the manner in which the objects or entities are distributed, bibliographic classifications create benchmarks and guidance in physical and in abstract space, and that nowadays they also allow for the same location in full text in the digital environment. In archives, classification is on the basis of effectiveness and administrative efficiency, contributing to the organization and management of information and knowledge. It also maintains a narrow relationship with other archival processes such as description.

References

Academia das Ciências de Lisboa. 2001. *Dicionário da língua portuguesa contemporânea.* vol. 1. Lisboa: Verbo.

Aranalde, Michel Maya. 2009. "Reflexões sobre os sistemas categoriais de Aristóteles, Kant e Ranganathan." *Revista Ciência da Informação* 38 no. 1. http://revista.ibict.br/ciinf/index.php/ciinf/article/view/1056/1313

Bacon, Francis. 1645. *De dignitate & augmentis scientiarum*…. Editio nova…Lugd.Batav.: Franciscus Moyardus et Adrianus Wijngaerde. Lugduni Batavorum: Franciscus Moyardus et Adrianus Wijingaerde.

Bearman, David. 1992. "Diplomatics, Weberian Bureaucracy, and the Management of Electronic Records in Europe and America." *American Archivist* 55, no. 1:168-81.

Bearman, David. 1993. "Record-keeping Systems." *Archivaria* 36:16-36.

Bearman, David. 2006. "Moments of Risk: Identifying Threats to Electronic Records." *Archivaria* 62:15-46.

Bearman, David and Richard Lytle. 1985. "The Power of the Principle of Provenance." *Archivaria* 21:14-27.

Brasil. Secretaria da Casa Civil. Arquivo Nacional. 2005. *Dicionário brasileiro determinologia arquivística*. Rio de Janeiro: Arquivo Nacional.

Daniels, Morgan G. and Elizabeth Yakel. 2010. "Seek and You May Find: Successful Search in Online Finding Aid Systems." *The American Archivist* 73:535-68.

Duranti, Luciana. 1995. "Reliability and Authenticity: The Concepts and Their Implications." *Archivaria* 39:5-10.

Duranti, Luciana. 1997. "The Archival Bond." *Archives and Museum Informatics* 11:213-8.

Faria, Maria Isabel and Maria da Graça Pericão. 2008. *Dicionário do livro: da escrita ao livro electrónico*. Coimbra: Almedina.

Fredriksson, B. 2003. "Postmodernistic Archival Science: Rethinking the Methodology of a Science." *Archival Science* 3:177-97.

Freitas, M. Cristina. V. de. 2009. *A Arquivística sob o signo da mudança: cenários arquivísticos (re)desenhados pelo documento eletrônico.* Salamanca: Facultad de Traducción y Documentación. Doctorate Thesis Degree.

Gil Urdiciain, Blanca. 2004. *Manual de lenguajes documentales*. 2ª ed. rev. y amp. Madrid: Editorial Noesis.

Gnoli, Claudio. 2014. "Boundaries and Overlaps of Disciplines in Bloch's Methodology of Historical Knowledge." In *Knowledge Organization in the 21st Century: Between Historical Patterns and Future Prospects: Proceedings of the Thirteenth International ISKO Conference, 19-22 May 2014, Kraków, Poland*, ed. Wieslaw Babik. Advances in knowledge organization 14. Würzburg: Ergon-Verlag, 129-35.

Hedstrom, Margaret. 1993. "Descriptive Practices for Electronic Records: Deciding What Is Essential and Imagining What Is Possible." *Archivaria* 36:53-63.

Henttonen, Pekka. 2014. "Bibliographic Subject Headings As Access Points To Archival Sources." In *Knowledge Organization in the 21st Century: Between Historical Patterns and Future Prospects: Proceedings of the Thirteenth International ISKO Conference, 19-22 May 2014, Kraków, Po-*

land, ed. Wieslaw Babik. Advances in knowledge organization 14. Würzburg: Ergon-Verlag, 461-68.

Heredia Herrera, Antonia. 1991. *Archivística General: Teoría Y Práctica*. 5ª ed. Sevilla: Diputación Provincial de Sevilla.

Hjørland, Birger. 2013. "Theories of Knowledge Organization-Theories of Knowledge." *Knowledge Organization* 40:169-81.

Horsman, Peter. 2002. "The Last Dance of the Phoenix, or the De-Discovery of the Archival Fonds." *Archivaria* 54:1-23.

Houaiss, Antônio and Mauro de Salles Villar. 2002-2003. *Dicionário Houaiss*. Lisboa: Círculo de Leitores.

International Council on Archives. 1997. *Guide for Managing Electronics Records from an Archival Perspective*. Paris: Committee on Electronic Records.

ISO 15489-1. 2001. *Information and documentation – Records management: Part 1: General*. Genève: ISO.

ISO 5127-6-1988. Documentation et information – Vocabulaire: partie 6: langages documentaires. In *Documentation et information: recueil de normes ISO I*. Genève: ISO, 87-111.

Jenkinson, Hilary. 1965. *A Manual of Archive Administration*. London: Percy Lund, Humphries and Co.

Macneil, Heather Marie. 1998. *Trusting Records: The Evolution of Legal, Historical, and Diplomatic Methods of Assessing the Trustworthiness of Records, from Antiquity to the Digital Age*. Vancouver, Canada: University of British Columbia. Doctorate Thesis Degree.

Menne-Haritz, Angelika. 2001. "Access: The Reformulation of an Archival Paradigm." *Archival Science* 1, no. 1:57-82.

Müller, Samuel, Robert Fruin and Johan Adriaan Feith. 1940. *Manual for the Arrangement and Description of Archives: Drawn up by Direction of the Netherlands Association of Archivists*. New York: The H. W. Wilson Company.

NP 4041. 2005. *Informação e Documentação. Terminologia arquivística: conceitos básicos*. Caparica: Instituto Português da Qualidade.

Pearce-Moses, Richard. 2005. *A Glossary of Archives and Records Terminology*. Chicago: Society of American Archivists. http://www.archivists.org/glossary/index.asp

Quicherat, L. 1927. *Novíssimo diccionario latino: etymologico, prosódico, histórico*. Paris: [s.n].

Ridener, John. 2009. *From Polders to Postmodernism: A Concise History of Archival Theory*. Duluth, MN: Litwin Books.

Rodríguez-Bravo, Blanca. 2011. *Apuntes sobre representación y organización de la información*. Gijón: Trea.

Rousseau, Jean-Yves and Carol Couture. 1998. *Os fundamentos da disciplina arquivística*. Lisboa: D. Quixote.

Schellenberg, Theodore R. 1956. *Modern Archives Principles and Techniques*. Chicago: The University of Chicago Press.

Simões, Maria da Graça. 2008. *Classificação Decimal Universal: Fundamentos e procedimentos*. Coimbra: Almedina.

Simões, Maria da Graça. 2011. *Classificações bibliográficas: Percurso de uma teoria*. Coimbra: Almedina.

Society of American Archivists. 2016. *Core Archival Functions*. http://www2.archivists.org/node/14804#.V2yf1le9q8o

Sousa, Renato Tarciso Barbosa de. 2007. "A classificação como função matricial de que-fazerarquivístico." In *Arquivística: temas contemporâneos*, eds. Vanderley Batista dos Santos, org., Humberto Celeste Innarelli and Renato Tarciso Barbosa de. Sousa. Brasília: Editora Senac, 79-172.

Theimer, Kate. 2011. "What is the Meaning of Archives 2.0?" *American Archivist* 74, Spring/summer:58-68.

Tennis, Joseph T. 2015. "Foundational, First-Order, and Second-Order Classification Theory." *Knowledge Organization* 42:244-9.

Appendix I.
A brief comparison between bibliographic and archives classifications: points of convergence and divergence

Aspects arisen	Bibliographic classifications	Archives classifications
Foundations	General theory of classification.	General theory of classification.
	Philosophical and empirical.	Philosophical and empirical.
Evolution	Great development from the 19th to 20th.	Great development from the 19th to 20th.
Definitions	Process (classify) and product (system or structure: *e.g.,* LCC, UDC, Colon, etc.).	Process (classify) and product (file plan, classification schema).
Principles	Empirical-rationalist philosophy: affinity, hierarchy, uniqueness, exclusivity, exhaustiveness /completeness.	Empirical-rationalist philosophy: affinity, hierarchy, uniqueness, exclusivity, exhaustiveness /completeness.
	Aristotelian ideas of genera, species, specific difference, comprehension and extension.	Specific archival principles: provenance, original order, archival bond.
Criteria	Pragmatic (*e.g.*, individual arrangement of items on the shelves, by subjects).	Pragmatic: records management needs (conservation needs, retention and disposition) Juridical, legal, administrative: evidential value of the records.
	Logical: classes, subclasses; facets	Logical: classes, subclasses, records, items.
	Represent epistemological areas.	Represents structures, functions and activities.
	Design *a priori*, but not only.	Design *a posteriori,* but not only.
	Subject-based.	Organic-based, functional-based or mixed.
Purposes and goals	Representation process emphasizes subjects or contents.	Representation process must reflect context (primarily), content and structure (in association with archival description).
	Arrangement of resources on shelves. Create benchmarks and guidance in the physical space and in the abstract space.	Compliant recordkeeping systems (authenticity and reliability).
	Information and knowledge organization (item by item), in large epistemological frameworks.	Information (and knowledge) management (aggregations). Effectiveness and efficacy in records management.
	Information retrieval (primarily).	Information retrieval (secondarily).
Trends	To meet the challenge of organization and representation of the information and knowledge on the Internet, allied to another systems and structures, such as taxonomies.	Challenges and opportunities posed by the digital age: Item level content description; give and increase access; promote accountability, governance and transparence; more effectiveness in information retrieval.