Chapter 2
Effectiveness of Reference Models for Knowledge Organization Systems:
A Cross-Analysis of Requirements

Luís Corujo

https://orcid.org/0000-0003-4411-2453

School of Arts and Humanities, Centre for Classical Studies, University of Lisbon, Portugal

Jorge Revez

https://orcid.org/0000-0002-3058-943X

School of Arts and Humanities, Centre for Classical Studies, University of Lisbon, Portugal

ABSTRACT

This chapter intends to study reference models for the development of knowledge organization systems (KOS) to evaluate their effectiveness and their modeling capacity through a comparison of requirements. The tools for the development of technological knowledge management systems that will be compared are Reference Model for an Open Archival Information System (OAIS), Modular Requirements for Records Systems (MoReq), and The Digital Library Reference Model. Through a comparative analysis of these instruments, it is proposed to evaluate and compare their main requirements. The planning of technological systems based on these standards/requirements brings guarantees of a correct use of classifications, thesauri, ontologies, among other types of KOS. They also promote their configuration in technological systems and regarding the business processes in which these technological systems are used.

INTRODUCTION

This chapter intends to study reference models for the development of Knowledge Organization Systems (KOS) to evaluate their effectiveness and their modeling capacity through a comparison of requirements. KOS is "functional items designed for organizing knowledge and information, and making their manage-

ment and retrieval easier" (Mazzocchi, 2018), "intended to encompass all types of schemes for organizing information and promoting knowledge management" (Hodge, 2000). In a clear synthesis, the «knowledge organization system is a scheme that models a structure (i.e.; elements and mutual relationships) of an organized set of knowledge» (Bratková & Kucerová, 2014, p. 8). The tools for the development of technological knowledge management systems that will be compared are: 'Reference Model for an Open Archival Information System' (OAIS) (Consultative Committee for Space Data Systems, 2012), 'Modular Requirements for Records Systems' (MoReq) (DLM Forum, 2011) and 'The Digital Library Reference Model' (Candela et al., 2011b).

Background

The Digital Library Reference Model (DLRM) has been understood as a conceptual framework that aims to capture the significant entities and their relationships in the digital library universe with the intent of developing a concrete model. It is the result of the efforts of the research groups that took part in the European funded DELOS Network of Excellence on Digital Libraries, and later by a team of international experts in Digital Libraries and the DL.org, a project funded by the Cultural Heritage and Technology Advanced Learning Unit of the Information Society Directorate-General of the European Commission (Candela et al., 2011b, 2011a). The framework presented in the Reference Model was conceived to coordinate approaches, solutions, and systems development in the digital library area so that Digital Library systems could be described, classified, and measured according to the key elements of this model.

This Reference Model is grounded on The Digital Library Manifesto, which sets the scene governing the whole activity and introduces the main notions characterizing the Digital Library universe in abstract terms. It starts by presenting an examination of the three types of relevant 'systems' in this area: Digital Library, Digital Library System, and Digital Library Management System. It also identifies the main concepts characterizing those systems, classifying them in several domains, each of them representing a particular aspect of the Digital Library universe (Organization; Content; User; Functionality; Policy; Quality; Architecture), and introduces the main roles that actors may play within the digital libraries (Digital Library End-Users, such as Content Creators, Content Consumers, and Digital Librarians; Digital Library Managers, such as DL Designers and Digital Library System Administrators; Digital Library Software Developers). Finally, it presents a plan for laying down a comprehensive characterization of the digital library universe, based on different artifacts capturing the universe at diverse levels of abstraction from the very abstract one (the Digital Library Reference Model) to the very concrete one (the implementation) (Candela et al., 2011b, 2011a).

The Digital Library Reference Model presents and describes the main concepts and relationships related to each of the aspects identified in the Manifesto, explaining their rationale as well as presenting examples of their instantiation in concrete scenarios. It concludes by presenting a set of criteria to determine the compliance of digital libraries to this Reference Model (Candela et al., 2011b).

The Reference Model for an Open Archival Information System (OAIS) is a Recommendation developed by the Consultative Committee for Space Data Systems in 2002, and published as ISO 14721:2003, both being updated in 2012. A third version is being drafted (the last draft update is from October 2020). It considers an OAIS as an archive, consisting of an organization, which may be part of a larger organization, of people and systems that has accepted the responsibility to preserve information and make it available for a designated community. The information being maintained has been deemed to need Long Term Preservation, even if the OAIS itself is not permanent. Long Term is long enough to

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