

Chapter 24

Cataloguing and Searching Musical Sound Recordings in an Ontology–Based Information System

Marcelo de O. Albuquerque

Federal University of the State of Rio de Janeiro (UNIRIO), Brazil

Sean Wolfgang M. Siqueira

Federal University of the State of Rio de Janeiro (UNIRIO), Brazil

Maria Helena Lima Baptista Braz

Technical University of Lisbon, Portugal

ABSTRACT

Although a lot of information is available worldwide, getting the right piece of information is challenging. In addition, integrating information from different sources is still very complicated. To make the different information systems to interoperate, it is necessary to provide common knowledge structures. Ontologies have been developed for making the semantics of a domain explicit. However, using such formal structures is not straightforward and their benefits are not clear to the users. The work presented in this paper explores the use of an ontology for musical sound recordings in order to allow cataloguing and searching for such information. Therefore it investigates how the knowledge society can benefit from ontologies, with focus on the culture, more specifically the music domain. Some possible benefits and pitfalls are also described and a case study shows an evaluation of the proposed approach by users of this domain.

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INTRODUCTION

With the evolution of technology, music reproduction and dissemination have increased in scale and quality. Edidin (1999) states the prevalence of recorded music has profoundly qualified the dependence of musical experience on performance and the significance of this change has many dimensions. The development of the Internet and in particular the Web contributed to the dissemination of musical sound recordings and musical collections as well as related information, either through the recording labels or on pages such as My Space, Pandora and peer-to-peer programs for file sharing. However, although the Internet has allowed music dissemination, the available information related to music sound recordings is still heterogeneous and finding the right record is not straightforward. Perhaps, it is a consequence of the dimensions of the changes on musical experience, but it is also related to the artistic nature of the domain. In addition, existing musical collections remain with restricted access and there are several problems related to the representation, searching and sharing of such data. In fact, music is a complex domain and has characteristics that make it difficult to be modelled.

To overcome some of these issues the concepts related to musical sound recordings should be organized and structured in a generic, standard and machine-understandable way covering as much as possible the requirements of this area. There are several works on the requirements of digital (musical) library systems (Ioannidis et al., 2008; Wang et al., 2006; Gonçalves et al., 2008; Diet & Kurth, 2007; Dunn, 2000; Scherle & Byrd, 2004) and on metadata structures for describing musical records (Riley, 2008; Ferrara et al., 2006; Abdallah et al., 2005; Raimond et al., 2007; Hemmasi, 2002; Lai et al., 2007; Lai, 2007; IFLA, 2008).

A possible solution to organizing and structuring information according to these requirements is to use ontologies. In the field of computer science and information systems, an ontology can

be understood as a formal representation of a set of concepts within a domain and the relationships between those concepts (Gruber, 1993; Guarino & Giaretta, 1995).

Albuquerque et al. (2009) presented a proposal for a specific ontology of musical sound recording collections. It was defined through the selection, definition and organization of ideas and concepts about music and recordings. This ontology proposal was considered for developing a system (prototype) in order to evaluate the benefits that this proposal could bring. Therefore, this article aims at presenting and discussing the results obtained from the use of the mentioned ontology in a cataloguing system, as well as the evaluation and the contributions of cataloguing and searching musical sound recordings in an ontology-based information system.

The remainder of this article is organized as follows: We examine the use of ontologies for the development of information systems, and present the prototype developed for the cataloguing of musical sound recordings. We demonstrate the use of the prototype and describe some contributions to cataloguers and users. The last section presents the final considerations.

USES OF ONTOLOGIES IN THE DEVELOPMENT OF INFORMATION SYSTEMS

According to the etymology of the word in its philosophical origin proposed by Aristotle (384-322 BC), ontology is the study of the essence of things or being in itself.

The use of ontologies in the field of computer science emerged within the community of knowledge representation and was described in Guizzardi (2005), focusing on the need for a new approach to build information systems, to model and isolate the different types of knowledge, enabling reuse. As described by Damjanovic et al. (2004), Guizzardi (2005), and McGuinness (2002),

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