Metadata Design of a Content Management System for Music Virtual Learning Environment

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ABSTRACT

Virtual Learning Environment (VLE) uncovers a new learning space for students to start their learning in multidisciplinary subjects and provides an enormous storage for different types of learning materials. This brings not only the ease and flexibility to our learning, but also the challenges in organizing, managing, and controlling of information which is indispensable to the design of an effective online learning system. In particular, Music Information Retrieval (MIR) is an interdisciplinary science on the process of retrieving information from music related resources. Due to the unique application characteristics and various forms of music, appropriate design and application of metadata plays an important role for the MIR in such a Content Management System (CMS) as it would affect the comprehensiveness and effectiveness of the music information retrieval process. In this paper, the authors propose their ontology-based metadata scheme to address such requirements of a music VLE, based on the Dublin Core with modifications according to specific nature of the music learning materials. The metadata design of music resources aims to support students’ daily music learning by providing instant and appropriate learning materials which enables cross-collection searching and enhances the sustainability of the contents over time.

Keywords: Content Management, Information Retrieval, Metadata Design, Music Education, Suzuki Approach

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INTRODUCTION

Nowadays, more and more learning institutes are willing to provide the Virtual Learning Environment (VLE) through the establishment of online learning systems to facilitate their students in participating learning activities. There are vast amount of contents from different disciplines inside such systems. To access relevant information, students need to surf through the system by using built-in search function with keywords to locate relevant information. However, different interpretation and understanding of the same keyword varies depend on the backgrounds of students. Thus, mismatching of information may be resulted. In order to assist students to locate relevant information, one of the possible ways is to standardize the meanings of keywords and apply appropriate ontology design to the system. Therefore, describing the data in a proper and suitable way becomes essential. Besides, it also helps resolve the problem of different understandings in terminology and maintain the consistency of the definitions at the same time (Berson & Dubov, 2007).

Metadata is data that describe other data, the standardization of which enables relevant information to be connected and arranged in proper order (Mathes, 2004), thereby enabling stakeholders to find, access, use, and manage information resources. In particular, well-defined metadata schemes based on particular communities and contexts assists users to specific the properties and classify data into appropriate disciplines, and therefore enable users to achieve various objectives easily with proper aligned definitions and terminology. One of the popular usages of metadata is to facilitate the sharing and exchange of learning objects (Duval, 2001). In this paper, we present our design of an ontology-based metadata scheme to describe the music resources to address the requirements of music VLE, and demonstrate its usability with details and examples. Berson and Dubov (2007) suggested that metadata definitions can help to clarify the relationship and determine the associations between entities throughout the database. So, we depict our metadata scheme design with an Entity–Relationship (ER) model to describe the structure and relationships of data about data, and further show our implementation in a relational database (Elmasri & Navathe, 2011).

In this paper, the VLE is based on the design of the Web 2.0 with Alert Support for Suzuki-Approach Platform (WASSAP). This proposed VLE makes use of the Web 2.0 technology to support Suzuki method for music learning (Chan & Chiu, 2011). The Suzuki method focuses on the interactions among teachers, students, and their parents. Obviously, a positive, supportive and nurtured learning environment supported by parents is of great important to students’ learning. This “mother tongue” approach emphasizes that parents are the best educators of their children at home. During the learning process, parents can provide the most suitable and proper environment for their child in study of music (Comeau & Swadley, 1998). Further, children will be flourishing the best when they are in an atmosphere of encouragement and praise. However, most of the parents are busy in their work and huge effort is required to spare the time for their children. To overcome this problem, the WASSAP VLE provides a platform to assist and facilitate busy parents to increase the participation in their children music learning activities. It acts as bridges among teachers, students and parents, with the aim of assisting parents to be aware and conscious about the learning progress of their children and suggesting collaborations among parents and teachers. The WASSAP VLE provides not only a communication system between teachers, students and parents, but also employed a Content Management System (CMS) as a central repository to serve the information to all stakeholders in a flexible and timely way. The sharing features offered by the Web 2.0 technology enable all parties to access the learning contents through the VLE anytime anywhere. In
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