Chapter 14

An XML-Based Customizable Model for Multimedia Applications for Museums and Exhibitions

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ABSTRACT

Inclusion of Information and Communication Technologies (ICTs) and multimedia in a museum can result in a functional upgrade of the visitor experience in an exhibition. The added value of ICTs includes promoting the enhancement of educational, research, and entertainment purposes towards which a museum has already been designed. To better understand the potential role of ICTs in museums, the authors introduce an XML-based customizable system. In this chapter, they present an XML-based customizable multimedia solution for museums and exhibitions. The proposed approach serves multimedia content solutions for the assistance of visitors and researchers. A modular approach is adopted in order to provide a User Interface abstraction and operation-business logic isolation from the data. The key advantage of the proposed solution is the separation of concerns for User Interface, business logic, and data retrieval. The proposed solution allows the dynamic XML-based customization of museum multimedia applications to support additional data from new seasonal or one-time exhibitions at the same museum, re-arrangement of the exhibits in the museum halls, addition of new digitized halls with the respective multimedia data and any additional documentation or multimedia extras for existing exhibits. The authors present a case study at the digital exhibition for the history of the ancient Olympic Games at the Older Olympia Museum. Several hundreds of exhibits have been included and the dynamic management was successful after a careful digitization procedure. The results have been encouraging, the users and administrators’ feedback was positive, and the full-scale deployment was successful.

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INTRODUCTION

Multimedia tools used in museums facilitate communication of large amounts of information in a user-friendly and interesting manner. In parallel, multimedia tools allow visitors to access the information they require at their own pace (Allison & Gwaltney, 1991). However, multimedia tools are applications that do need careful structuring in a normalized way through a model for the application subsystem layer (Zafirovic-Vukotic & Niemegeers, 1992). Without this, often many multimedia tools offer services using many times either the same or similar elementary capabilities and functionalities at the application layer, when usually new data arrive or data have been re-arranged positions.

Nowadays, electronic information destined to be delivered to applications takes the form of multimedia, which integrates different types of media including text, images, video, and audio. This is the reason why many techniques are being exploited for effective manipulation of this great amount of information by multimedia applications in the cultural heritage sector (Kanellopoulos, 2011). In this chapter, we propose an effective way of handling multimedia data in order to facilitate organization, which allows for future expansion and effective organising of multimedia content. For this purpose, XML (eXtensible Mark-Up Language) is used, because it has become a standard mark-up language. To achieve this goal, a multi-tier architecture has been devised. The key aim is to achieve re-usability of the business logic layer in order to be able to deliver new exhibits or digital exhibitions as a whole using the same already deployed multimedia application. The proposed concept targets minimization or elimination of application logic tuning, implicit user interface re-construction and extension of fresh and updated multimedia data delivered. In parallel, the robustness of the application is guaranteed, as the business logic stays intact following the initial abstraction and the design of open source code.

There are several cases where Web-based multimedia solutions have been employed in order to give re-usability of the application and logic layers (Styliaras, 2007). However, the robustness of the delivered multimedia tools and applications cannot be claimed as soundproof of issues and malfunctions. This is caused by lots of factors such as: (1) the inherent features of HTML that cannot support full multimedia, (2) the unguaranteed stability in implementations for collaboration between Web and external application such Flash technology (Adobe Flash Platform, 2012), and (3) the non inherent support of kiosk mode isolation and UI security in Web browsers. All the previous factors make it clear that Web technologies may fall short of expectations, when it comes to deliver multimedia application for the public (Kanellopoulos, 2011), as in the case of museums. Furthermore, in our proposal, we deal with another aspect that allows data and code re-usability, delivers open data manipulation with no need for updated of the deployed application, and gives an open framework to present any number of exhibits, exhibitions at a thematic topic.

The proposed solution is presented analytically, while it is implemented at a large-scale end-user case study delivered at the Digital Exhibition of the History of Ancient Olympic Games. This exhibition is hosted at the respective Museum in Olympia, Greece (Information Society, 2012; Culture.gr, 2012). In the deployed case, a large number of exhibits have been digitized and transformed into multimedia. The multimedia content is effectively organised and delivered to avoid maintenance cost and time using the proposed solution, based on XML structures and separation of concerns in the multi tier architecture given. The real life deployment shows the generality of the proposed solution and potentials that it has to be delivered and implemented for additional real life digital exhibitions and multimedia museum applications.