FORMULATING DESIGN GUIDELINES FOR CULTURAL HERITAGE MULTIMEDIA SYSTEMS WITH BYZANTINE ART CONTENT

C. Voutounos*, A. Lanitis and P. Zaphiris

Dept. of Multimedia and Graphic Arts, Cyprus University of Technology,
P.O. Box 50329, 3036, Lemesos, Cyprus,
{c.voutounos, andreas.lanitis, panayiotis.zaphiris}@cut.ac.cy

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ABSTRACT:
The development of future multimedia systems for the presentation and preservation of Byzantine art necessitates the formulation of special design guidelines, which brings Byzantine art and new technologies in a constructive technocultural symbiosis. The e-learning and pedagogical effectiveness of multimedia projects with Byzantine art content, the visualisation of Byzantine imagery, the deeper and devoted research in issues like the aesthetics of Byzantine art, the spiritual communication of Byzantine art promote the need of a technocultural approach synthesized by two "distinct" elements, multimedia and Byzantine art. With a proposed evaluation experiment for a website with a Byzantine theme, we investigate the reactions and perceptions of young people for Byzantine art, in order to create design guidelines applied on future projects with relevant content. The results of this survey evaluation study, targeting a group of Cypriot young people 15-30 age, superimpose the argument that multimedia e-learning projects specialising in Byzantine art, should promote design strategies that will enchase the communication of Byzantine art in new media.

1. INTRODUCTION

Multimedia information systems are being used in a large range of information dissemination applications such as educational applications, entertainment, news, health, military - civil defence, tourism and cultural applications. According to the application domain, the design of a multimedia information system should address special issues related to the nature of the information presented and the needs and abilities of the anticipated users. For this reason the design of successful multimedia information systems needs to be based on design guidelines derived through careful analysis of the needs of the target group (Shneiderman, 1998) in relation to the application domain. Due to its importance, the general topic of establishing guidelines that enable user-specific design guidelines for general applications received considerable interest in the literature (Nielsen, 2000).

A special case of multimedia information systems are involved with applications that require concentration, spiritual involvement and deep engagement of the user in order to maximise the attractiveness of the application, maximizing in that way the educational impact and the level of spiritual interaction offered. Typical examples of such applications include multimedia systems for presenting artefacts and/or artefacts with symbolic meanings as part of information dissemination in cultural heritage applications. Such applications may require special design strategies so that the end result fulfils the expectations and needs of the target users.

To the best of our knowledge, the formulation of customized design guidelines for multimedia applications that require the spiritual and emotional engagement of the user was not addressed in a systematic way so far. With our work we aim to derive design guidelines that can be used for developing multimedia systems for the presentation and preservation of Byzantine art, enabling in that way the maximization of the user satisfaction in relation to the material absorbed by the user.

As part of our work we presented to a number of young volunteers the web site (www.culture.gr/mystras-edu) containing information about Byzantine art and asked the users to complete a number of tasks/scenarios that enabled them to experience different features of the system. The experience of the users was then evaluated through a customized questionnaire that aims to assess key aspects of the system. The results obtained are analyzed and a set of design guidelines related to the development of multimedia systems for presenting and visualizing Byzantine art are derived from the results.

While many multimedia projects with archaeological and cultural heritage interest promote effective design practices that engage the potential users, we notice that multimedia projects specializing on Byzantine art, rarely promote the aesthetic and spiritual qualities of Byzantine art. We argue that the narrative potential of new technologies provides us the content creation tools for a successful aesthetic interpretation of Byzantine art and the effective engagement of perspective users. However the exigent factor for a success of such a system relies on a focused design, which especially applies design guidelines for multimedia design with Byzantine art content.

Our research indicates that the specific issue of formulating system design guidelines for the sector of Byzantine art has not been studied in the literature so far. On the other hand, HCI is a very important field of study towards the implementation of content oriented design guidelines. Accepting the principle that user engagement is depended upon the design of specific application (Nielsen, 2000) and the usability based on age centred design (Zaphiris, 2005) content oriented design also requires a careful understanding of needs and abilities of users.

For justifying this argument we needed firstly to identify the background of young teenagers - adults on Byzantine art, and secondly to address their needs on using multimedia systems with Byzantine art content. Initially we directed our interest on a special age group of Cypriot population in order to derive design guidelines that reflect young age perceptions. The work described in this paper presents the initial stages of our ultimate task that involves the development of a multimedia information system for the narrative presentation and aesthetic communication of

Byzantine artefacts. We are conceived that the presented design guidelines will be of utmost importance towards the development of a system that fulfils the expectations of the perspective users, contributing in that way to a more usable, enjoyable and effective distribution of information and knowledge related to Byzantine art content. Although our work is mainly dedicated towards the design of systems with a Byzantine theme, we anticipate that the end results and the proposed methodology will be applicable for the design of similar cultural heritage related systems that require the spiritual engagement of the users.

The remainder of the paper is structured as follows: In section 2 a brief history of Byzantine art is presented. In Section 3 issues related to Byzantine art and multimedia are presented in order to justify the reasons that the design of relevant multimedia systems requires customized design principles. The methodology adopted, the results obtained and conclusions about our work are presented in sections 4, 5 and 6 respectively.

2. BYZANTINE ART

2.1 Historical Evolution

Substantially Byzantine art begins around 330 A.D. when the capital of Roman Empire is transported in Byzantium. Byzantine art from the catacombs time has been progressively shaped in a particular form of art with concrete characteristics and special formality. Initially samples of early art depictions adorned the catacombs with wall paintings that presented portraits of Saints, representations from the life of Christ, as well as symbolic representations. This special form of art evolved throughout the ages in the spirit of the church and tradition accepting however exterior effects, for example Hellenic naturalistic elements or even Egyptian art abstractive elements. Byzantine art was formed to its characteristic Byzantine image and language identity at the beginning of the 6th century (Popova, 2002).

After the Joustinian era (527-565), the early flourishing period of Byzantine art is followed by the Middle Byzantine period. The second flourishing art production period peeks during the Macedonian dynasty (867-1055) when Byzantine art has taken a more canonical form. From the middle of the eleventh century till the taking of Constantinople by Crusaders in 1204, Byzantium is ruled by Comneni and Angeli. The Comnenian era leaves a special technotropy style in Byzantine art, the Comnenian style (Yuri, 2000). During the last dynasty of Byzantium the Palaeologan, lasting from the revival of Byzantine Empire in 1261 till the fall of Constantinople in 1453, Byzantine art underwent a renewed flourishing known as the "Palaeologan Renaissance". Also in the Post Byzantine period Byzantine art is not extinguished but is flourishing in the island of Crete (with the famous Cretan school) and in many other Orthodox centres including Cyprus.

2.2 Theoretical foundation of Byzantine art

While Byzantine art "style" varied considerably during different periods the overall style remained stable. The various styles of Byzantine art are expressed through Byzantine aesthetic ideas determined by the Christian religious consciousness (Popova, 2002). In regards to Byzantine icon-painting the Byzantine image uses a particular language, which expresses irreproachably the doctrines and the commands of Orthodox Church. It is an art of spirituality which is expressed with the tools of painting without being just a painting. The Byzantine iconography - "Agiografia" portrays Saints in pictures, "writing" their narrative depicted Hagiographies.

In contrast to the naturalistic religious painting of the West a Byzantine image does not imitate human physiognomies. Characteristics of Byzantine iconography like big eyes, small mouth, big nose, tall - thin figures, do not present Saints in their absolute physiognomies representations. Historical realities are rather expressed with perfect symbols in various Byzantine art compositions. While historical reality constitutes the most important question for the church, Byzantine art proposes a transcendental, exceeding the borders of time, revelation (Clement). These values apply in all traditional mediums of Byzantine art (icons, murals, mosaics, illuminated manuscripts, engravings, liturgical objects) and in Byzantine architecture. The religious and pedagogic extensions of Byzantine aesthetics are considered major cultural qualities of the theoretical foundation of Byzantine art (Michelis, 1967). Unfortunately these qualities are very often neglected by stakeholders of Byzantine art's visual reproduction in new media.

3. BYZANTINE ART ON MULTIMEDIA

3.1 The problem on presenting Byzantine art in multimedia

In general, virtual heritage scientific community faces a relevant critical question. This concerns the credibility and validity of disseminated cultural heritage information. Very often the documentation and validation methodologies applied are in question by professionals who have a stake in this field, for example archaeologists. Their expressed concerns for the Virtual Archaeology field raise questions on the reliability and the motivations behind many Virtual Archaeology projects (Ryan, 2001). The "spectacular" presentation of heritage material, in opposition to the archaeological consideration, is a basic argument for archaeologists who feel that virtual heritage is taking control out of their hands. For these reasons, even for the demanding field of 3d visualisations, newer approaches (Pletinckx, 2008) promote interpretation tools for heritage visualisations according to the requirements of the content.

But where the problem lies as far as Byzantine art heritage interpretation in multimedia is concerned? In regards to the World Wide Web presentation of Byzantine art, for plain reasons of ownership, museums holding Byzantine art heritage usually promote their artefacts and disseminate information of academic level in a limited way in the web. Also this information is mainly intended for general public (Foskolou, 2007). In terms of Byzantine art aesthetics which is a subject equally important for pilgrims, Byzantine art students and specialist researchers, most usually church websites provide that kind of spiritual, cultural and academic content information (www.art.solidarity.gr/).

In recent VR (applications, scientists propose innovative imaging techniques for the 3d virtual reproduction of Byzantine monuments (http://byzantinecyprus.com/) and realistic computer graphic simulations for Byzantine art based on cultural heritage sites and objects environmental illuminations (Happa, 2009). But apart from the imaging innovations in Virtual Heritage the exploitation of spiritual cultural elements eg rituals and sacraments (in relation to sacred art) in virtual environment design, is rather rare. While some researchers are interested in recreation of intangible cultural heritage elements (eg, dance, religious services, music), (Papagiannakis, 2002) the typical

narrative potential of many works engage users in a virtual experience communicating mostly historical information (which in some cases might be misleading). Virtual heritage research proposes many innovative methods eg, game design formulas and user evaluation techniques (Champion, 2003) to strengthen the agency artefact interaction, but still the multimedia interpretation of Byzantine art is a unique case which needs special treatment.

In most cases the spiritual cultural element in multimedia is proposed usually for entertaining the user rather as to present deeper cultural spiritual values (Lutz, 2001). The interpretation of deeper spiritual values which consists the essence of Byzantine imagery in most cases is not assisted in new media. Reliability for virtual heritage is a very important issue which concerns research on Byzantine art, an art which at the same time is so commonly known and unknown from the perspective of scientific circles. For this reason we have to identify the stakeholders who can be involved in the design of multimedia and virtual heritage projects with Byzantine art content and propose design special guidelines for this unique field.

3.2 Byzantine art on multimedia, a short review

In this section we describe four multimedia projects related to Byzantine art. These projects constitute good paradigms for study and evaluation towards the formation of general design guidelines for the unique case of Byzantine art.

Application CD-ROM COFIA, library of Byzantine history and art: Cofia (Cofia, 1994) was subsidised by European funds in the perspective of the work "SAPFO: Multimedia for education and civilization". The incompatibility of the software with modern hardware and software is the major disadvantage of the system, since the work COFIA was completed in 1994. The minimalistic design of the interface with simple hypertext links, subtle decorative design elements (Byzantine manuscript illumination), and the access to material of about 3500 illustrated book pages are the best features provided in our opinion. The site promotes a modest design which facilitates the navigation and sustains user attention. The learning material covers a large range of Byzantine content issues, which could potentially interest the general public but also dedicated Byzantine researchers.

Website - Cultural treasures of the Church of Greece: This work (www.art.solidarity.gr/) is a sponsored initiative for the creation of a digital collection for the cultural treasures of the Church of Greece. It contains a large collection of digital material (ecclesiastical art, architecture, literature heirlooms, ecclesiastical museums, music and Christian monuments). It also includes a digital map and multimedia instructional material on "the presence of Christian temple". The website promotes the "dissemination of spiritual messages through the modern dialectics of information technology".

Web Application / Virtual tour - Byzantine museum of Archbishop Makarios III foundation:
The virtual tour in (http://www.makariosfoundation.org.cy/) (Kunkel, 2008), is a web application composed of connected spherical panoramas allowing the perspective user to explore the Byzantine Museum of Makarios III from inside the webpage of the foundation. The user can have an interactive communication with the application, choosing the panorama views of their choice. The main scope of the design of this work, with its panoramic visualisations of museum collections, is to create a presence feel in an immersive web environment which serves as incentive to visit the real place. The user has the capability to view the digitalized assets of Byzantine art (mainly icons) and get short descriptions for some of them.

Kastropolitia tou Mystra: The site (www.culture.gr/mystras-edu/) development was funded by European Union and sponsored by the Greek ministry of education. The Byzantine theme "Kastropolitia of Mystra" is about a unique castle - Byzantine state, which is the most well preserved Byzantine state in Greece. The organized structure of the website provides learning material that potentially might interest young children, the general public but even specialized researchers. The addition of instructions to teachers and adults for guiding 10-14 year old children proves the pedagogical - e-learning nature of this site. The website hosts important information for a place of local interest, a devastated Byzantine state of the 13th century. It contains also information on Byzantine art which we consider important for the proposed evaluation. The design of the webpage structures the content in a way to assist the viewer to navigate through, read information, view images and play also educational games.

Although there are good existing examples of multimedia systems presenting byzantine art, there is no established set of design or/and evaluation guidelines that can safely designers use and follow for establishing an effective, enjoyable and usable experience for young people. With our work we aim to define a set of design guidelines so that the dissemination of information related to Byzantine art is done in an effective way that satisfies the needs of the users.

4. METHODOLOGY

In this section we describe the methodology adopted in order to derive design guidelines for Byzantine Art Multimedia system development. From the beginning, the methodology plan was set to target a special age group, young population of ages between 15 - 30 years old to assist to a critical design stage, which is the evaluation of existing multimedia systems. The results of the evaluation are then used as the basis of formulating design guidelines. At this point we decided to exclude younger age children because they still shape their knowledge and perceptions on Byzantine art, while young teenagers - adults have a more crystallized personal view which we would like to evaluate. Similar works of evaluations with young population were studied (Lucia, 2009), for different application domains, however we had to prepare an evaluation test to extract information on design which is content and site specific.

4.1 Case Study

The evaluation was done for the publicly available site "Kastropolitia of Mystra" site (www.culture.gr/mystras-edu/) that was presented in section 3.2. "Kastropolitia of Mystra" is an extensive webpage which can assist teachers as a school aid tool for additional educational material on topical history and Byzantine history material which is not included in the taught material. The design of a multimedia system with Byzantine art content is based on a Technological pedagogical content knowledge framework (Mishra, 2006) which eventually has a greater appeal on young age people. The chosen site was used as part of the evaluation procedure for the following reasons:

- The information on Byzantine art in a special part of the webpage and the overall design was suitable for our evaluation test.
- The overall design of the site (that incorporates instructions to teachers and adults for guiding children) proves the pedagogical - e-learning nature of this site.

4.2 Evaluation Stage

The group of volunteers who participated in the experiments included 9 males and 21 females whose mean age was 21 years (range, 15-30 years; standard deviation, 5 years). They were high school and university students, as well as young professionals with intermediate -very good acquaintance with computers and internet. The evaluation of the site was carried out with the supervised use of questionnaire with 15 questions focusing on the site design and four demographic questions. The questions were set in such a way, in order to derive information related to five distinct aspects of the system design: (a) The attractiveness of application, (b) the popularity of the Byzantine theme, (c) the quality of graphics and graphical details, (d) preferences regarding the media used and (e) the educational impact of the system. Typical examples of questions that aim to derive information for the sections raised above include:

(a) How do you think that most people will react after viewing the homepage of the site? (Answers: i) ignore the site, ii) Follow links for viewing icons, iii) Read text and view images in a certain link, iv) Read all information in home page)
(b) How interesting do you find the topic of Byzantine Art? (Answer: scale 1 to 4)
(c) Are you satisfied with the level of detail of the icons presented in the site? (Answer: scale 1 to 4)
(d) Do you think that the addition of audio and video in the site would enhance the experience? (Answer: scale 1 to 4)
(e) What type of educational material related to Byzantine artefacts you prefer to be presented in the site? (Answers: i) artistic style of Icons, ii) Symbolic meaning of Icons, iii) Historical facts related to icons, iv) All the above)

The time to complete the questionnaire spanned approximately for about 10-20 minutes for each participant. The order and the theme of questions was arranged in a manner of revealing participants understanding, and background on Byzantine art as well as their perception of Byzantine art in relation to the design of the special part of webpage under question. The scenario guided the participants to follow a certain navigation route within the web site, enabling in that way the evaluation of certain design elements of the site and its contents. Apart from answering the questionnaire, data related to key reactions, feelings and comments of the volunteers were recorded in a notebook by the administrator of the questionnaire. Such data reveals information that may not be extractable just through the questionnaire.

5. RESULTS

In this section we present the most important results derived through the analysis of the responses of the volunteers. The results/conclusions reported are based on results obtained through the questionnaire and the observation of the reactions of the volunteers. Based on the analysis of the results we formulate a set of key design guidelines that should be adopted for designing and/or evaluating similar applications.

5.1 Results

The results from the questionnaire are analyzed with respect to the demographics of the users and the five aspects (listed in section 4.2) of a multimedia system that we wish to evaluate.

Demographics: According to the results, the vast majority of the volunteers (86%) described themselves as religious so the results presented mainly refer to subjects with a religious background. Unfortunately the lack of samples with no relevant religious background limits the generalization ability of the conclusions - as part of our future work we aim to stage similar evaluation with users with varying religious backgrounds. As far as computer usage is concerned, more than 90% of the users stated that they have adequate computer skills. On average each volunteer uses the internet for about 3 hours per day. The most popular activities carried out using the internet listed in decreasing order are i) social networks, ii) educational activities, iii) job related activities, iv) computer games and v) on line-shopping. According to the results one can conclude that an important aspect of computing interests of the volunteers from the test group (and eventually the target audience) is social networking and educational activities. Therefore it is reasonable to assume that the combination of a Byzantine theme multimedia information system with an on-line environment suitable for supporting social networking and educational activities will have a positive impact on attracting users.

Byzantine theme: A strong tendency of associating a general Byzantine theme with art is recorded among the test group. Apart from art issues volunteers associated a Byzantine theme with emperors, religious issues and Byzantine literature. In contrast Byzantine icons are primarily seen as a way of expressing religious related actions and at a lower level as a means of obtaining information about the history of Saints that appear on Icons. This conclusion is not surprising given the central role of Icons in the Orthodox religion. Although the interest of the test group for sites with Byzantine theme was not rated as a top priority, adequate interest that justifies the creation of relevant information systems was recorded. The association of a Byzantine theme with art dictates the need for enhancing art-related issues within a relevant site.

Educational impact/ Content: The educational impact of an application was clearly highlighted among the users as a key issue in relation with the success of a site. According to the results, more than 70% of the members of the participants expressed the view that multimedia-based education can be more efficient when compared or combined with traditional learning methods. In a different question the educational value of a site was rated among the most important features of multimedia information system. These responses lead to the conclusion that users of a site with Byzantine theme expect to receive knowledge during their visit to the site.

The need for an increased educational value of a relevant site is also highlighted by responses to questions related to the type of content that should be displayed in relation with Byzantine icons. 50% of the volunteers expressed their interest for a comprehensive metadata information presentation of icons and other Byzantine artefacts in multimedia systems. Such metadata should include the creator (many works of art are not signed), craft-Byzantine painting techniques applied, the lifecycle and history of the artefact but also symbolic and religious

interpretation of Byzantine art which is very often neglected. In most sites that display Byzantine icons the content of the system usually includes only descriptions of digitized assets in regards to the title given, type and category, the place that is being kept and cited bibliography rather than providing the type of comprehensive metadata required by a significant proportion of the end users.

Attractiveness of application:
Despite the fact that an adequate interest for a Byzantine theme was recorded, after viewing the home page of the site about half of the users indicated that they would had preferred not to carry on with the exploration of the web site. Along the same lines less than 50% of the volunteers found the home page of the site interesting. This observation leads to the conclusion that even in cases that the theme is interesting, an attractive web page is absolutely necessary so that users are encouraged to carry on with the navigation. In addition a strong view suggesting that the ease of navigation was a key issue in relation to the attractiveness of the system was recorded. Therefore standard HCI techniques need to be applied for this type of applications and on top of them design guidelines specific to the application domain need to be considered.

Quality of graphics:
About 90% said that the quality of images of icons presented on the web site was acceptable. However, at the same time most users expressed a strong preference for viewing images with even better quality that enables the observation of fine details. This result is reasonable since in our earlier observations it was revealed that most volunteers associate a Byzantine theme with art hence a site with a relevant theme should present artefacts in a way that enables user to observe the artistic nature of icons.

Multimedia Support:
85% of the volunteers indicated that the use of other media other than still images and text, such as video and sound (that also implies narration) would enhance the overall experience. In addition more than half of the users have a positive attitude to the use of a VR system as a means of implementing information dissemination systems with Byzantine themes. Also the opinion that a VR implementation would enhance the overall spiritual engagement of users was expressed by more than half of the users.

5.2 Design Guideline Formulation

Based on the analysis of the results, it is possible to identify a set of important design guidelines that need to be taken into account during the implementation of a multimedia system for presenting Byzantine Art. The design guidelines defined are:

- Special attention is needed for a systems interface (in case of website, homepage).
- The system should provide effortless navigation through different sections.
- Design for knowledge gain (using reliable content from reliable academic sources) should be among the top priorities.
- Content-Treatment of different aspects (i.e. History, Byzantine aesthetics, religion, archaeology) should be treated individually or in a balanced way, to help the viewers absorb information.
- Images with art-content should be displayed at high resolution and so that users are able to observe details.
- Use of multiple media (images, text, sound, and video) is highly recommended.

Apart from the design guidelines quoted above the following recommendations were also derived:

- Designing immersive 3D virtual world is desirable, but questionable (the design of a virtual world will need a different design but many guidelines of these questionnaire might work as principles for immersive environments)
- Incorporating social networking elements (based on user's everyday activities) could form an attraction point.

Although there is evidence that these recommendations are important, their applicability needs to be substantiated through an evaluation of additional sites/systems that display the aforementioned characteristics. Additionally since the evaluated works mainly involve web content, special account will be given in line with existing guidelines for Web content eg Web Content Accessibility Guidelines (WCAG) 2.0 (http://www.w3.org/TR/2008/REC-WCAG20-20081211/) but also accessibility Guidelines for virtual world design which at the moment has not received the same level of attention as web accessibility (Tewirn, 2006).

6. DISCUSSION AND FUTURE WORK

A group of Cypriot young people 15-30 age, provided their perception and interpretation on Byzantine art, after navigating an educational website with a Byzantine theme, based on a questionnaire outlined scenario. The reported experiment enabled us to establish a set of design guidelines that designers can use for designing effective multimedia systems with Byzantine art content. Basic guidelines include the system interface design requirements, effortless navigation design, content specific design and use of special multimedia design recommendations.

The results of the study superimpose the argument that multimedia e-learning projects, specialising in Byzantine art, should promote design strategies that will enchase the communication of Byzantine art in new media. A main concern regarding the multimedia presentation of Byzantine art is the validation of Byzantine art based on Byzantine aesthetics, one of the main aspects of Byzantine culture and spirituality, which we consider very important. Apart from the real hosts of Byzantine art, nowadays technology allows the presentation of Byzantine art in the internet, multimedia and VR systems which very often results in the loss of cultural value during reproduction.

We realise that the disadvantages of virtual reproduction has effect on the "Aura" of artefacts and cultural heritage in general (Flynn, 2007) but some evidence from our evaluation show that proper presentation can protect the reproduced cultural values. For example some of the volunteers reported that two Byzantine images on the site caused them feelings of spiritual connection with the images even though the content of the page does not support such spiritual interaction (instead it provides general, mostly historic information). We believe that in Byzantine Multimedia systems, the "Aura" of Byzantine art could be enhanced with special design that will promote content, aesthetics and social interaction. The multidisciplinary nature of this work requires special confrontation for which assistance

from multimedia developers, HCI specialists, Byzantinologists, historians, theologians and system perspective users is considered very essential. For this reason we are planning to determinate the role of different expertises in the system development cycle and expand our design systems research on Byzantine art. So far the on - study, target group experimental results enabled us to propose a set of valuable content - user centred design guidelines and establish a framework for future developmental design strategies.

However undertaking this research we faced some limitations. For example the small sample size (number of volunteers) does not enable large scale generalisation of the outcomes and statistical error-free conclusions. In addition the target group had more females than males and the participants had common religion. In the future we plan to address those issues by staging a similar evaluation study for a larger population group with demographic diversity, with participants of various ages-religions as part of an inclusive design study (Nicolle, 2001). The use of similar evaluation studies with various HCI guidelines can assist in deriving more standardized "know how" design strategies (Zaphiris, 2005). On the other hand, despite the relatively small sample size, the evaluation experiment gave us insight information that otherwise we could only hypothesize for, reliable results and content specific derived guidelines that researchers can employ in the development of future cultural heritage multimedia.

The current work is part of an ongoing work for the development of multimedia systems with Byzantine art content. We believe that more effective application - content specific systems will promote the better transmission of Cultural Heritage information, including spiritual aspects of cultural heritage. We anticipate that the end results of this study may be applied for different cultures with different religions and other intangible cultural heritage characteristics, where the user may establish a unique aesthetic relation with digitized artefacts presented in various multimedia systems. Through our work it was demonstrated that the development of valid and narrative preservation techniques for Byzantine art presentation in cultural heritage multimedia systems is multidisciplinary exigent work, for which researchers need to employ special design practices. We argue that a main aspect of designing cultural heritage multimedia systems is the critical phase of addressing evaluation content specific practices at the beginning of system design.

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