Hypermedia development in the Benaki Museum

Adapting the beast to the beauty: a case study

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Abstract

Several methodologies attempt to identify the parameters and seek optimal solutions to the equation which describes the complex development process of interactive multimedia. The application of such systems in museums adds new degrees of freedom to the design process while implementation and evaluation issues compete in complexity with content selection and management. Despite the initial skepticism, many museums worldwide decide to meet the challenge and enter the realm of experimentation with new technologies in their exhibition and educational programs. This paper describes the first experiences which stemmed from two on-going projects at the Benaki Museum, involving the development phase of two interactive exhibits. Our aim is to provide food for thought for developers of interactive multimedia in the museum community.

Two systems

Following two prototype systems, namely the *Sacred Way* CD-I and the *Gold of Greece* [5] application and in view of its new exhibition to be opened in 1996, the Benaki Museum has undertaken the development of two interactive exhibits to go beyond the prototyping phase: the first, code-named

MITOS/ID is a client-server system which will be incorporated in the new exhibition of the museum and will allow access to the centralized multimedia database via a fast fiber/copper Local Area Network whereas the second, *Gika*, is a WWW educational application for the paintings of Nikolaos Hadjikyriakos-Gikas, one of the most important contemporary Greek painters.

Identifying and Attracting the Audience

The design process starts with two difficult questions. What is the target audience and what does the system under development aim to accomplish? Answers to these questions will -probably- not lead to specific design decisions. However, they help designers construct a conceptual user model and guide subsequent decisions regarding both the selection of subject mater and the system's behavior and look and feel.

The user model cannot be defined in fine detail nor can it be static over time. In fact, user expectations and abilities change and evolve, being directly affected by the technological artifacts [2]. Similarly, as Koester points out in [9], "[museum] visitors increasingly expect multimedia in every environment they encounter" and, in parallel, "multimedia communication skills are required to assimilate increased flood of animated, colorful or *jazzy* presentations of information".

Work is being carried out towards automating the construction of formal user models and analyses of user interactions [7]. Such models attempt to map the user's behavior and a system's interaction pathways into a formal notation space which may be processed and lead to the design of a working system [8,15]. Current practice excludes their manual construction, being a time-consuming task.

MITOS/ID is addressed to the "motivated museum visitor". This over-generalizing description has a high risk of conveying very little information about the potential user. Narrowing it down, the profile of a fourteen year old will be more informative. A young person of that age may be challenged by a stimulating interface or be uninterested by a boring design. The latter case is what we wanted to avoid without having to customize the system for a special audience. Other virtues of that age that we want to consider in our design are: broad spectrum of interests or in other words lack of very specialized interests, self-motivation and willingness for participation in non-naive games-playing, familiarity with technology and computers.

Some critical issues that need to be addressed during the design phase are the following:

- What kind of system do we want to produce? Be it an information point integrated within the museum exhibition or placed in a dedicated media room, a portable CD-ROM or a World-Wide-Web exhibit, the application must have specialized structure, interface, content and system requirements.

- What usage scenario do we envisage (in terms of the topology of the exhibit, usage duration as well as navigation and interactivity)?
- What information will the system convey?
- What will be its main focus?

Yet another electronic catalogue? System profile and character.

We can claim that current practice in interactive multimedia has only scratched the surface of the potentials and capabilities of this new expressive medium. Being a fairly new and unexploited area as it is, we risk the danger of using the technology for merely more attractive implementations of existing ideas. The catalogue metaphor is an example, whereby information is presented as an on-line catalogue, enriched with images, sound, video and supporting powerful search capabilities. Museum objects are typically presented one at a page/screen with hypertext links leading the user to related information. Applications following this metaphor are Microsoft's *Art Gallery* and the Benaki Museum's *Gold of Greece* prototype.

A talking book displayed on a screen, however, is not necessarily better than a printed version with nice illustrations. In essence, this is not quite interactive multimedia.

Paradigms and challenges

Interactive multimedia can be paralleled to theatrical plays or adventure movies. A film with very good special effects may thrill its audience. Good photography and music score are both big pluses. Yet, the deciding factor to make the film work is the combination of the script, direction and actors' performance. If one of these ingredients fails the film will have something missing, not to pass unnoticed by the audience, let alone the film critics!

The gauge which indicates the success of a motion picture measures the extend to which the audience is captivated and engaged in the story. As Brenda Laurel puts it, "who knows better how to sustain interaction and interest than those who create theatrical experiences?" McKendree and Mateer observe that filmmakers have developed a number of formal and informal techniques for analyzing actions, representing them effectively, and communicating them to others, and they conclude, "film language carries many suggestions about the influence of presentation on the interpretation of information."

Bilson observes that "Cyberspace feels like a performance environment" and that deep insights about interaction design can be gained by taking a long step back, and looking at live performance within a social and cultural context. The relationship between live performance and audience participation can -in many cases- be catalytic for community-building.

One of the three contexts that affect total museum experience, according to the Dierking and Falk "Interactive Experience Model", is the Social Context which consists of the interaction between the visitor and friends, other visitors or museum staff (Koester, p.17). The Social Context can and should be exploited by designing participatory multimedia experiences, not necessarily limited to the WIMP-based interface but using novel multi-modal or immersive and (preferably) non-immersive virtual reality experiences.

Interdisciplinary design -Roles

One of the unique characteristics of multimedia applications lies in the fact that their development involves the collaborative effort of people from many disciplines. Art historians and archaeologists provide the domain expertise and ensure the appropriateness of the *content*, writers give shape and meaning to raw data or ideas, editors review a writer's work and modify it to be understandable and effective, film and video people (creative as well as technical staff) help to enliven the produced multimedia artifacts, psychologists and cognitive psychologists study user behavior and response to stimuli as well as information and knowledge assimilation, graphic designers produce attractive and aesthetic screen layouts, human factors practitioners test usability and finally computer scientists solve technical problems and (hopefully) produce a working system.

Working with Ms Archaetou

The involvement of many people with diverse cognitive, educational and social backgrounds turns the development of interactive multimedia into an exciting as much as difficult procedure. Based on our experience at the Benaki Museum, we have identified some of the factors which are likely to create obstacles in a collaborative effort:

(1) *Differences in participants' reasoning*. Everyone of us is creating a model of the world according to which our behavior and attitude are determined. This model is shaped by the socio-cultural and educational background as well as one's prior experiences. Within a development team, roles have to be clearly specified, a balance between theoretical and practical thinking must be stroked and smooth communication pathways must be paved to enable people who are not used to teamwork to collaborate with others and meat the set deadlines.

(2) *Age differences* between team members and *techno-phobia*, two factors which may not necessarily be coupled, can again be alleviated by establishing a relationship based on trust, patience and collaboration.

(3) The negative effect of *computer illiteracy* is twofold: first, people may not feel comfortable with the use of technology, thus requiring an introductory phase to understand and use the computing facilities and second, by not being familiar with the possibilities and limitations of the technology, it is difficult to visualize the concept and therefore to contribute to and constructively criticize the system under development.

(4) Museum curators are sometimes skeptical about the use itself of computer-based technologies for portraying archaeological artifacts and works of art.

They feel that using a colorful, «jazzy» application to display artifacts, though it may look attractive, there is a high risk of not paying the necessary *respect for the artifact*, which is their main concern. This risk cannot be ignored and we feel that it is the curators' role to ensure that the produced system not only "respects the artifact" but it also helps the audience to comprehend its historical and artistic value.

Ms Archaetou is the typical archaeologist-museum curator. Although her participation in the development team might occasionally be problematic, her deep knowledge and understanding of the artifacts and their history, is essential to the project as she provides and processes content, ensuring at the same time its appropriateness and scientific accuracy. Furthermore, her contribution is likely to lead to more creative exploitation ideas of the content, combined with the expertise of the other team members.

(5) *Time* is a very critical issue and meeting the deadlines set is even more difficult in the case of in-house development. This is due to the fact that it is not feasible for a small/medium-sized museum, to occupy exclusively curators, documentalists and technical staff for the development of multimedia exhibits. Unfortunately this has been our case and the first prototypes of our systems have only recently been produced and are still at an early stage.

We have failed to predict accurately that documenting the objects is very time consuming as is to collect and digitize images and sound. Of course when deadlines are not met, progress and even the continuation of the project are jeopardized which, fortunately, did not happen in our case.

Documenting the design space

During the design phase we examine the use of semi-formal methodologies such as Questions-Options-Criteria (Q.O.C.) for documenting the design space. Such methodologies serve the

designer in two ways: first, as tools to record the rationale behind each important design decision, they provide a systematic approach to analyze the design space, identify the available options and justify design decisions based on strong criteria; second their outcome can be used as a design document which communicates the design rationale to other members of the development team or may support subsequent software maintenance.

Content management

A very important issue in the development of multimedia-based systems is the efficient use and management of the multimedia data, including images, video, sound and text. In museum applications in particular, re-usability of data from existing electronic archives can facilitate the development process. The ESPRIT Hypertext Interface For Information (HIFI) project and its prototype Gold of Greece, exemplifies the importance and potentials of re-using data from Collection Management RDBMSs to construct hypermedia exhibits.

In our two on-going projects we focus on the management and re-usability of multimedia data stored on the MITOS/CLIO Cultural Database which was developed to support curatorial research and also the use of SGML as a generic text marking tool and an interface to produce HTML code for Mosaic/Netscape.

The usability lab

Usability testing is becoming increasingly important in the evaluation phase of interactive multimedia systems. Within Fame, an on-going EU project, we are setting-up our usability lab and developing tests in order to identify the crucial parameters for both content and interface evaluation. We plan, in the very near future, a series of supervised test sessions whereby actual users will be provided with a set of tasks including specific information retrieval, browsing and navigation. Users will be prompted to *think aloud* [17] and communicate their opinion and feelings be it satisfaction or frustration. Some of the sessions will be videotaped to allow subsequent processing. MITOS/ID and Gika will be subjected to such tests and the results will be fed to the next iteration of the design cycle.

Conclusions

Based on our early experiences in developing two applications at the Benaki Museum, we have attempted to record a number of issues pertaining to the design and development phases of interactive multimedia in Museums. Much of the success of such an artifact lies in the composition of the

development team and the innovative exploitation of content whereas usability problems can be dealt with by performing cost-effective test sessions.

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