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THE FUTURE OF HYPERMEDIA PRESENTATION AND THE TOPKAPI PALACE

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ABSTRACT:

This paper summarises the specification of a hypermedia system in which the main goal is to improve conventional data organisation problems of historical architecture. The research is being carried out as a PhD thesis in the ABACUS group of the University of Strathclyde, Glasgow, U.K. and is funded by the Scientific and Technical Council of Turkey (TUBITAK). To solve conventional data organisation, the research concentrates on a hypermedia system in which the aims are also to organise visual, textual and oral information effectively. In this way, a hypermedia system scenario is graphically developed. This application explores some important results to discuss the current hypermedia technology and the future of interactive presentation.

1. PROBLEMS IN CONVENTIONAL DATA ORGANISATION FOR HISTORICAL ARCHITECTURE

As we know, basically, historical buildings can be represented separately in visual, textual and aural form without their being brought together and organised. Visually, historical buildings are represented either in a very simplified way using techniques such as sketching, outline drawing and one colour rendering or in a realistic way using classic painting such as water colour, pastel and oil painting and more advanced rendering such as air-brush and computer graphic (1).

Parallel with recent developments in technology, realistic representation is even improving using photography, computer animation, stereography, virtual realty and holography.

On the other hand, historical buildings are described in textual forms. This representation can be either a headline or a title which summarises the historical concept of the building, or a full description in literature, academic or technical writing.

However, previous experiments have shown that, most of the time, a full description of a building in textual form can be boring for the reader. Because of this, listening descriptions are preferred to reading long texts. In this way, people are informed by oral representation in tape records.

Although historical buildings are separately represented in visual, textual and oral form, it is difficult to represent an architectural reconstruction by one of these methods whatever the quality of performance is, since art and architecture is a process communication between presenter and spectator (2). For an efficient presentation, visual, written and aural

representation could be organised in three ways: cross referencing, comparison and transition.

1.1. Cross referenced representation

From an architectural point of view, there are four different combinations in cross referenced representation:

1. Cross referencing between visual representations:

To stress the relationship between two or more visual images which are represented in the same view, graphical signs such as arrows and/or geometrical shapes are used in the organisation but if visual images are represented in different views, graphical explanations are not sufficient to explain these relationships.

2. Cross referencing between textual representations:

Two or more textual representations could be referred to by names or numbers. In this organisation, there is one main text and several additional texts which detail the idea of the main text. The reader can access the detailed text through the main text by looking at the relevant name or numbers . In paper based presentation, a standard is developed for this cross referencing method(3): If the text is in the same view, the 'footnote' style is used; but if the text is in different views, the main text and its detailed text are coded by the same name or number, the reader can access the detailed information using this reference name or number. In conventional usage, the use of this cross referencing method is not very easy and is time consuming especially in the representation of reference books and citation indexes.

3. Cross referencing between visual and textual representations:

Visual and textual representation relate to each other in two ways:

In the first way, the text is put directly next to the image of the historical building. In the second way, the related text and image are numbered to access the image easily through the textual explanation.

4. Cross referencing between visual and aural representation:

The organisation of visual and aural representation is commonly used in video and movie presentation. In conventional practise, the image of the historical building and aural explanation are presented simultaneously.

1.2. Comparative representation

This representation is especially organised to compare two different hypotheses of the same historical buildings. There are two methods :

In the first method, one view can be compared with another view by holding them side by side. To adequately display the comparison, the similarities and differences are indicated by graphical signs such as arrows

and geometrical shapes or by the same type of colour and texture. To effectively draw the attention of the user to the comparison , animated graphical signs, flashing colour and texture can be used in the moving presentations.

In the second method, two views which are seen side by side on the screen can be overlapped transparently by moving them into one place but overlapped images may confuse the viewer in distinguishing which colour or line belongs to which image.

Between two or more hypothesis, several comparisons are represented. For instance, hypotheses are compared for structure, proportion, plan organisation, typical plan investigations, lighting design, human activities, etc. However these comparisons cannot be represented visually in just one view; several diagrams are represented separately (otherwise, the use of graphical signs becomes complicated and the learner may be confused)

In conventional method, these diagrams may be presented on the same page but mostly they are presented on different pages. Therefore the viewer can not easily and quickly recover all comparison ideas at the same time and also cannot easily and quickly compare 'comparisons' which are presented on different pages (or even on the same page).

1.3. Transitional representation

In this organisation, the aim is to represent the historical development of the building. To achieve this aim, different process are used in still and moving presentation.

In still representation, historical development can be conveyed by sequenced image which are represented in the same view. Here, the spectator tries to understand the historical changes by following the sequenced views but the continuity cannot always be perceived instantaneously.

To prevent this problem, sequenced views can be animated by computer graphic techniques . In this technique, one view can be replaced with another by dissolve effects . This continuity helps the viewer to easily understand the changes within the image. To study changes carefully, the spectator can stop the presentation and can go back to a previous image in an unchangeable order but cannot jump to any desired view in this representation.

From the above discussion, it could be summarised that there are three problems in conventional data representation:

1. Several visual images and texts can not be represented in one view and in an understandable order.

2. The user cannot access specific information quickly and practically

3. Several comparisons can not be represented in one view.

Based on this study, it is concluded that the above problems could be improved by hypermedia technology in which the main aim is also to organise visual, textual and aural information. The research therefore concentrates on a hypermedia system to develop a better representation of historical architecture.

2. A HYPERMEDIA SYSTEM SCENARIO FOR HISTORICAL ARCHITECTURE

In the last couple of years, a hypermedia system scenario has been developed as a part of a PhD thesis which is being carried out in the ABACUS group of the University of Strathclyde to improve problems of conventional data organisation for historical architecture.

In this hypermedia system there are two main modules:

1. Multimedia Presentation

2. Media Editing Environment.

To send the user to the desired module, the system asks this question "Would you like to have a short trip around the historical building before going to the media editing environment ?"

There are two choices : YES and NO. If the user chooses YES, he/she accesses the Multimedia Presentation Module. In this module, the user can browse four presentations: sight seeing, place of special interest, life and contents / collection. Each presentation is represented in a window . The user can access a desired presentation by selecting one of these windows. There is also a window which shows the above question in smaller size. If the user wants to return to this question he/she simply selects the appropriate window.

If the user wants to access the Media Editing Environment, then he/she should choose NO. This choice sends the user to the Media Editing Environment where he analyses the building complex using computer images, computer animation, visual, textual and aural records.

2.1. Interface

When the media editing environment is initiated, the interface similar to the diagram below appears (figure 1):

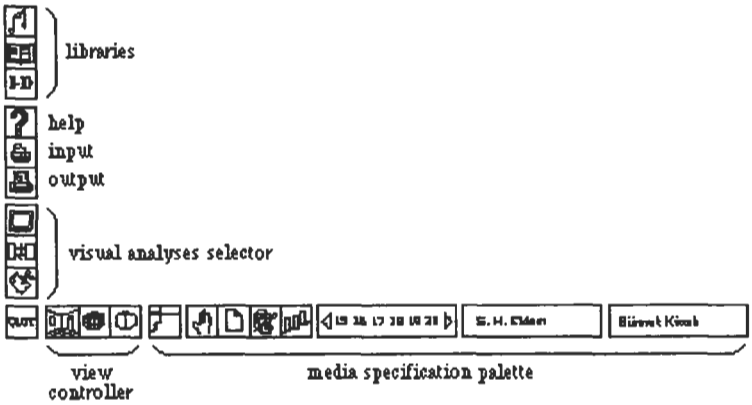

Figure 1- Screen Elements of the Media Editing Environment

On the screen, there is a media specification palette comprising input/output tools, a help tool, a viewer controller, a visual analyses selector and a quit button:

-Media specification palette:

There are six selectors on this palette; each selector has different facilities and specifies the media type as origin, presentation, representation, scale, name of the building, the name of the author and century (figure 2).

-Help Tool

To learn how to work with palettes, tools and selectors, the user activates the help tools. In this case, the aural helper tells the user what the tool is for when the desired tool is clicked and the mouse is held down.

-View controller:

This controller presents the building in three views :

- **exterior**
- **structure**
- **interior**

Each view can be changed independently by a controller at the bottom of the screen. When the user selects any of the above views, the current view on the screen is replaced by the selected view by a dissolve effect. Through these operations, the exterior, structural and interior views of the historical building can be changed to provide visual analyses.

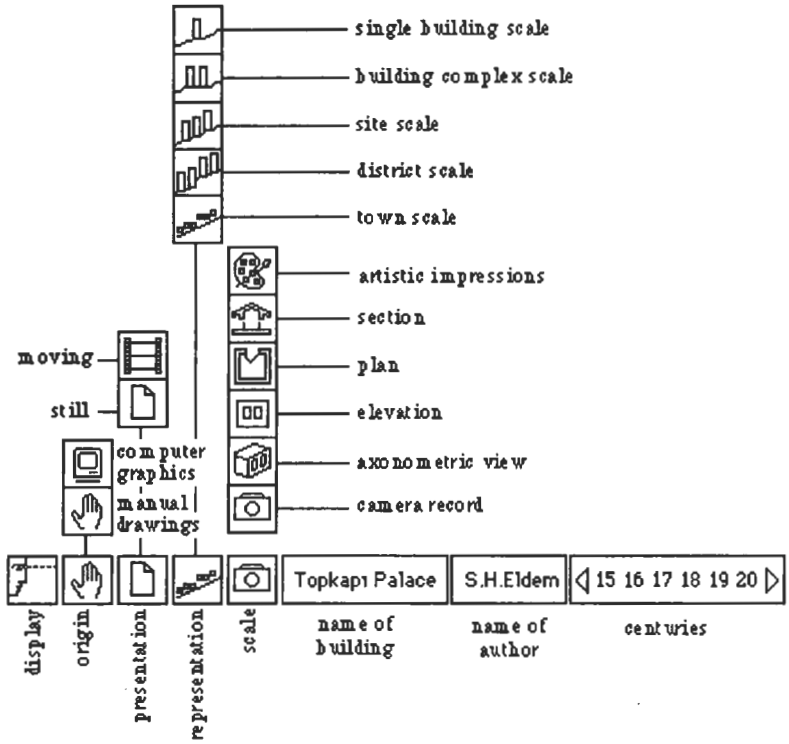

Figure 2- Tools in the Media Specification Palette

-Visual analyses selector:

There are three types of visual analyses provided in the selector:

- **display**
- **compare**
- **compose**

Each mode of visual analyses works by a different process. In the *display* mode, the user observes only one visual presentation such as a computer image, an orthographic drawing or an artist impression in full screen size. In this mode, the user can also browse the book and musical pieces related to the building which is currently displayed on the screen. In the *compare* mode, several media can be shown side by side in a window which can be re-sized and freely moved about by the user. In the *compose* mode, presentation can be processed to provide alternative visual analyses of architectural reconstruction

-Quit tool:

The user leaves the media editing environment via the *Quit* tool on the bottom left corner of the screen. After this operation the system returns to the system introduction

3. THE PILOT PROJECT : THE TOPKAPI PALACE IN HYPERMEDIA, BETA VERSION 1.0.

To see the practical results, certain historical data relating to the Topkapı Palace have been tested in this system scenario which has been developed in Macintosh Environment. This project is funded by the Scientific and Technical Research Council of Turkey (TUBITAK).

Historically, the Palace was a very important building for the Ottoman Empire. After the Sultan Mehmed II took Istanbul from the Byzantine Empire, he established a royal palace. When this was burnt down, it was replaced by the Topkapı Palace. In contrast with the first one, the Topkapı Palace (called the New Palace) was designed not only for 'Imperial Apartments' but was also intended for governmental offices and military services. Over the centuries, the complex was developed and extended to the *Sarayburnu* and become 'a city in the city' with kiosks, mosques, hospitals, baths and a kitchen complex. Late palaces, the *Çırağan*, *Dolmabahçe* and *Yıldız* which were planned in a more western style were completed over a short time span and did not have the same wide range of functions. In this respect, the Topkapı Palace is unique example (5).

Sociologically, the Topkapı Palace is well-known worldwide . The Harem where Sultans spent their private lives, becomes a subject for novels, films and operas. The social life, relationships, and events have been extensively studied by many researchers. The Governmental and military establishment of the Place which influenced European and Islamic Culture have also been the subject of extensive study. All of these activities ensure the continued popularity of the Topkapı Palace.

There is a rich source of material in different form relating to the Palace. There are several visual collections such as, engravings, paintings, miniatures, maps, photographs which recount the development of the palace over the centuries. The written records such as *seyyahatname* (traveller book), *masraf defteri* (account book), *ferman* (sultan's law) describe kiosks and gives detailed information about the materials which were used for the construction (6),(7).

In this research of the Topkapı Palace, the main goals are to develop a practical application using existing hypermedia software, to demonstrate the

Palace Complex within a simple hypermedia file structure utilising less storage capacity and to load the information easily into the system. For this reason, the system scenario is being developed in the HyperCard Programming Environment. Basically, HyperCard organises visual information in 'stacks'/ of cards. A stack is a HyperCard file and the 'card' is the main information unit of the stack. There are five common 'stack' structures: *linear*, *tree*, *network*, *single frame* and *combination* (8). These types of data organisation are quite useful and practical for a small amount of information. However the Topkapı Palace has hundreds of visual documents belonging to 170 kiosks and pavilions. In this case, it is not practical to put all of the visual information in to the cards because the data are large and exist in many formats, such as still images, animation and sounds. HyperCard can only handle data in the form of black and white images and sounds, and its animation capabilities are limited.

To prevent this problem in the Topkapı Palace Project, an alternative stack structure is developed by HyperCard Software and QuickTime Technology. QuickTime Technology is a new technology integrating dynamic data such as animation, video and sound (9). Although visual data can be settled in HyperCard stacks, in this structure, visual data are stored as QuickTime files and the HyperCard stack is only designed as a navigator to access the QuickTime file. This new structure allocates only a few cards and allows the developer to use the same interface for all visual information.

There is only one weakness in the structure: QuickTime technology limıts the capabilities of interactive presentation because the information is not part of the HyperCard stack; QuickTime data does not allow as much interactivity as HyperCard. Therefore, the developer can not locate any visible or invisible buttons or tools within a QuickTime file to link one visual document to another.

Currently this hypermedia structure is being developed with the acceptance of the software limitations which are summarised above. At the moment, the application only runs for the fourth courtyard of the Topkapı Palace.

CONCLUSION:

As a result of the Topkapı Palace Project, it is clear that hypermedia technology promises to organise various visual, textual and oral information of historical buildings in a more *efficient* and *understandable* way. Although QuickTime Technology reduces the storage size of images, a sophisticated application still requires enormous data storage capacity. In the case of the Topkapı Palace, 170 building can be displayed in 7 704 000 different ways by the media specification palette depending on the origin, representation, presentation, scale and century.

From this result, it is clearly understood that it is impractical to organise such a large collection of visual information in view of current hardware, software and mass storage limitations. Because of this, hypermedia technology requires new developments in the near future. First of all, current technology should be improved to keep more information in less storage space . Secondly, to prevent the massive file sizes of computer animation currently found in this system, the user should be able to fly and walk through one or a few computer models, thereby reducing storage requirements. To do this, the Hypermedia system should include modelling and rendering capabilities. If this is possible, the user is able to view the model of a historical building endlessly in any direction. The connection of hypermedia technology with modelling and rendering programmes promises more sophisticated interactivity in the presentation of historical architecture but this will also depend on the speed of available hardware and software.

SYSTEM CONFIGURATIONS

Apple- Quadra 700, 8/80 MB, 25 MHz, HyperCard, MicroMind Directory, QuickTime, Architiron II, Staratavision, Photoshop.

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