

10 THE ELECTRONIC GUIDE AT THE MUSEUM OF DION

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In this paper we present the stages of the creation of the first electronic guide in a Greek Museum, the Museum of Dion. The guide, built on the Macintosh OS, is currently used to provide information about archaeological exhibits in the Museum. All practical aspects from initial discussions to creation of the working prototype are presented. The actual guide was constructed by applying a two stage procedure. Initially a prototype using a small number of items was created. The final design and implementation was carried out after detailed revision of the prototype. Issues addressed in this paper may provide valuable information for other similar applications.

Applications of information technology (IT) in archaeology has been a challenging issue. Museums and University departments in History of Art and Archaeology have seen IT as an expensive luxury within their restricted budgets. The capabilities of the new technology, the copyright of electronic information, as well as practical difficulties related to the implementation of the new technology have made the introduction of IT in museums and in the traditional field of archaeology a slow procedure (EVA 1991-1993 conferences). The idea of the guide is attributed to the first author who has been working closely within the National Gallery during the VASARI project. Starting from the success of the Micro Gallery project in the National Gallery, detailed discussions were carried out in Greece which eventually led to the establishment of a close contact with Professor Pandermalis and his team from the Department of History of Art and Archaeology of the University of Thessaloniki. Professor Pandermalis is the director of excavations at ancient Dion, the sacred city of the Macedonians at the foot-hills of Mount Olympus in the prefecture of Pieria in Northern Greece. The finds from the excavations are kept in the Museum of Dion which is close to the archaeological site. The electronic guide of the

Museum of Dion was partially funded by the Greek Government through the Mediterranean Integrated Programme (MIP).

Initial discussions about the possibility of the creation of an electronic guide led to the construction of prototype on a black and white one bit Macintosh SE. The prototype was constructed using photographs from the published museum guide and associated material. The prototype which included sound, stills, text and animation, was a decisive factor for the realisation of the project. (See Figs. 1a to 1d).

Discussions concerning practical methods for applying IT, led to the creation of a team of two archaeologists, who were responsible for the collection of the raw material. The existing museum archive consists of a black and white photographic print and a record for each item. Since the quality of the existing source photographs was inadequate for the needs of the project, all museum items were photographed again on 35mm colour slide film. The slides were digitised using a Microtek slide scanner. After a brief discussion on the user needs a prototype consisting of a small number of items was created.

The evaluation of the prototype revealed problems associated with the original design. A number of different perspective users tested the prototype and the feedback was discussed extensively within the team. After rectifying design deficiencies, the final prototype, which incorporated an elementary database of the museum items was created.

The stages of creation of the guide

Initial discussions - Creation of an elementary prototype

Initial discussions on the possible use of a computer display as a Point Of Information (POI) in a museum environment revealed the doubts of the users about the capabilities of the technology. Although the discussions could show the potential of the technology, it was quite evident that the lack of low cost working prototypes at a national and/or international level, could not persuade any prospective user on the feasibility of the application. In order to break the deadlock, it was decided to create an inexpensive prototype on an one bit Macintosh SE using HyperCard. Information (the official Museum Guide and a publication about Dion) was given to the programmer/designer.

After 4 weeks an elementary prototype was presented which showed how sound, images (one bit), animation and database enquiries could be integrated on a single computer screen. This prototype had a decisive impact, as the interested parties were impressed by the capabilities of the technology. They were also persuaded to invest effort and resources towards the construction of a more elaborate electronic guide.

Collection and processing raw material: text, photography, digitisation and definition of interactivity

The application development team consisted of one programmer/designer and two archaeologists under the direction of the professor. During a period of two months, both archaeologists carried out extensive research on the records of museum exhibits.

It was estimated that the photographer of the museum should be able to photograph all necessary items (160) within a week. The programmer/designer used part of the material in order to create a prototype under the following requirements.

Fig. 1a Initial screen

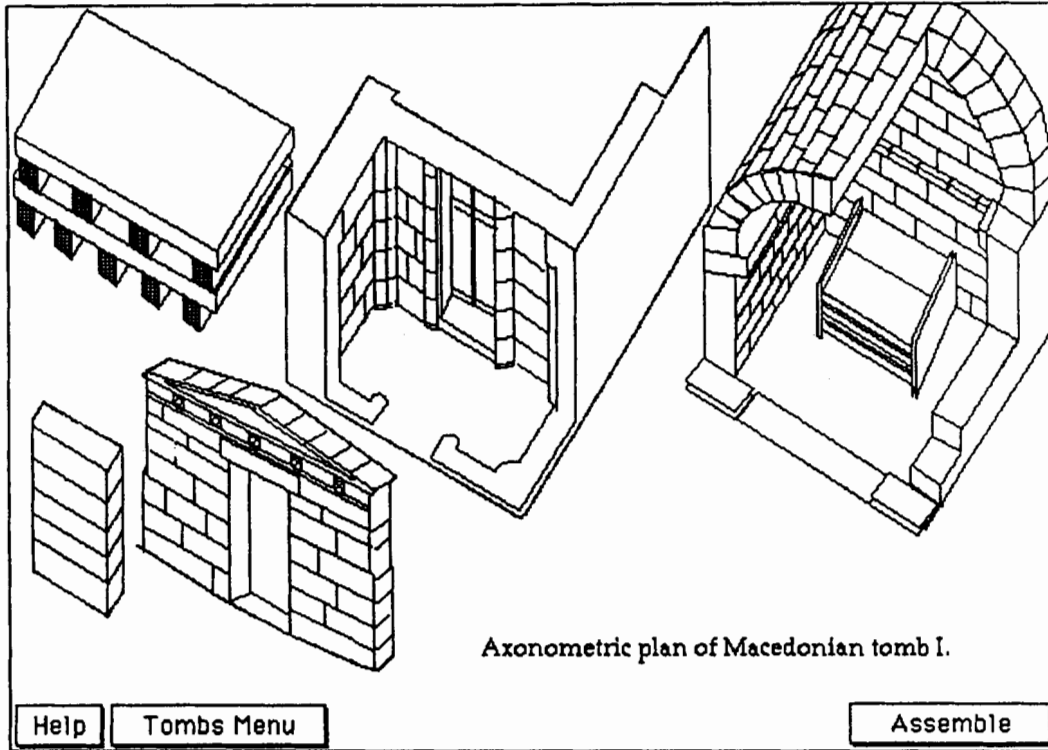


Fig. 1b Animation sequence

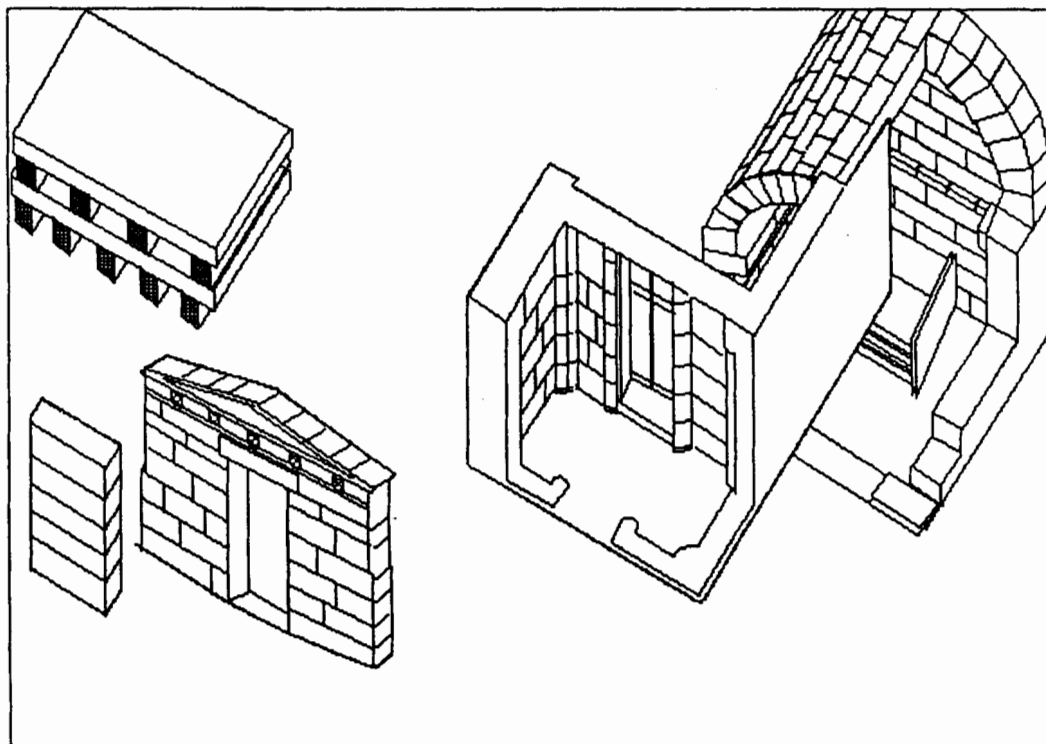


Fig. 1c Animation sequence (continued)

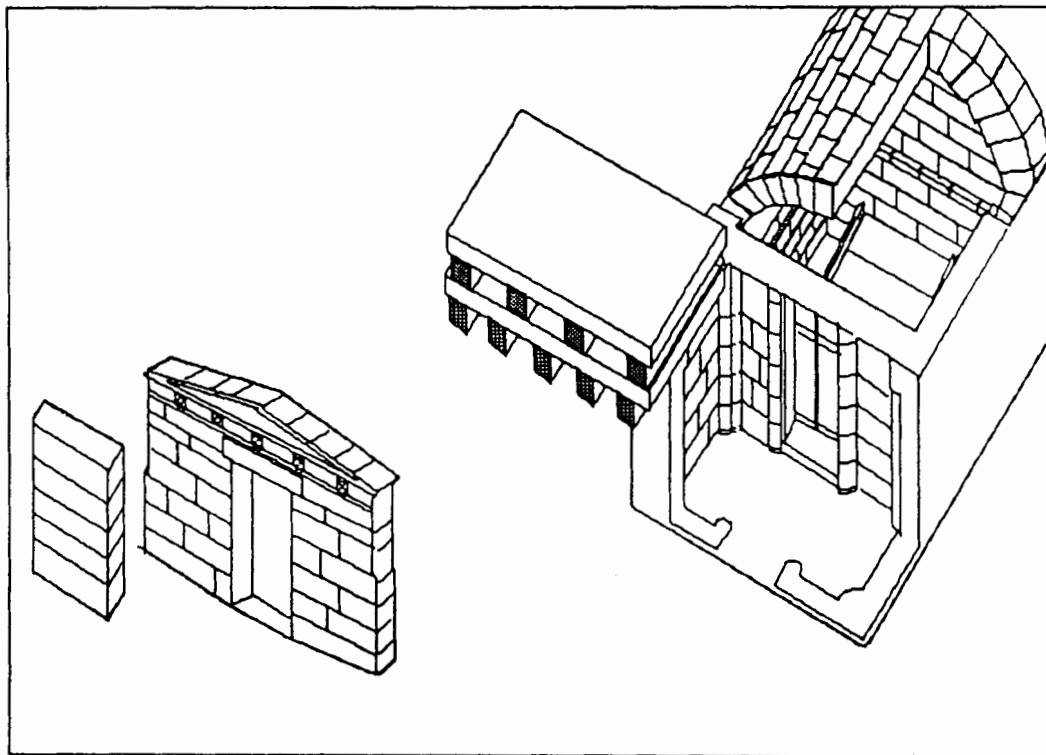
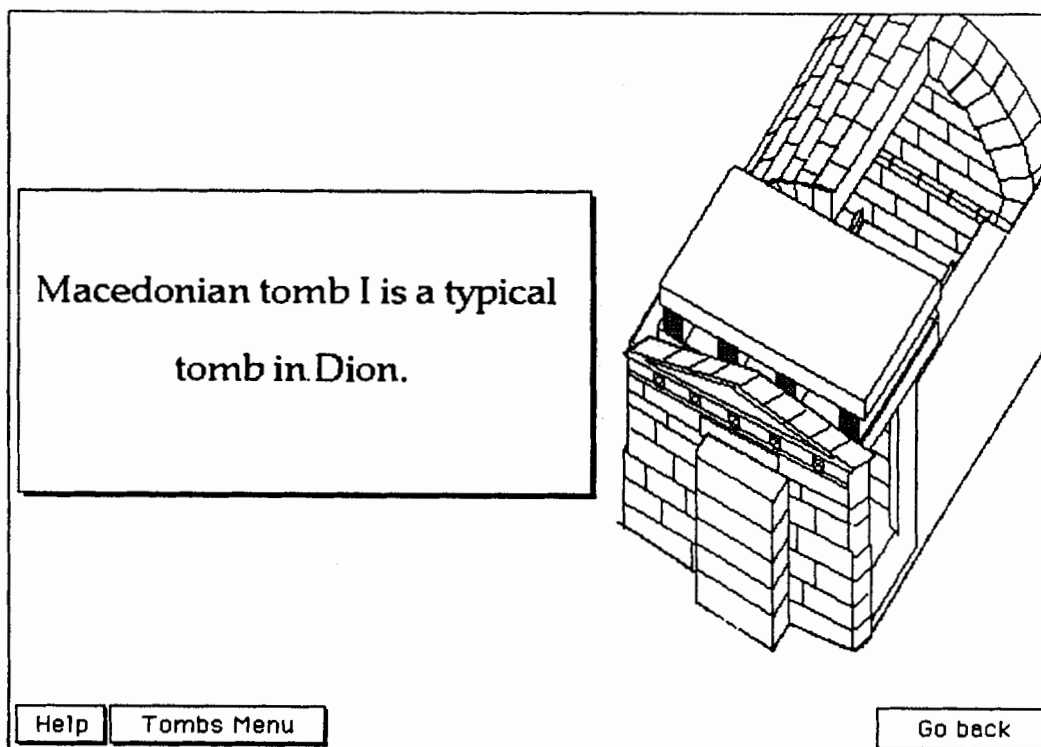


Fig. 1d Last frame of the animation sequence



- Each item should be described within one screen.
- The location within the archaeological site should be displayed.
- The user should be able to access *similar items*. More specifically this requirement was expressed as follows: *the user should be able to find all museum items related to main names (such as Zeus, Aphrodite, Demeter)*. It was also decided to restrict the initial requirements for the following reasons:
 - Archaeological items have specific structure: they are generally 3 dimensional items and therefore some form of scale should be associated with each item, for getting an idea of sizes.
 - The records of each item were specifically constructed for archaeologists. The POI should be addressed to ordinary users who cannot easily grasp the terminology employed by the archaeologists.
 - It was rather difficult for the archaeologists to define what is meant by the term similar objects. Both time restrictions and the available budget were not adequate to allow extensive research on detailed grouping of the items of the museum. The implemented database mechanism took into account that the user should not be concerned with detailed explanation of the scientific meaning of the employed terms if he could grasp the basic meaning of each displayed item.

It was decided that each item should include the following fields:

- a title
- a brief description
- the three sizes (width, depth and height) whenever applicable
- location of the item within the archaeological site
- dating of the item.

The above fields took also into account discussions with the museum personnel about questions from the public concerning the exhibits. There were problems trying to define what is meant by the term depth for a vase or which sizes of a complex object should be displayed. Another critical question was the following: Given a statue resting on a separate base what is the actual height? the height of the statue, the height of the base or both and which one to display on screen. In order to overcome this issue the maximum size of any single item was recorded.

After agreeing on the basic structure of the screen displaying each item, the records were modified in order to convey the meaning of each object within four to five lines of text at most. Photographing of the items is a rather tedious process which usually takes more time than expected (Philips IMS, 1992 on elapsed time). The photographs were obtained within one month (actually there were about 6 full days of photographing within a period of 4 weeks quite close to the estimated week).

The slides were recorded as they arrived from the photographer. A Microtek ScanMaker 1850 S was used to digitise the slides. It was connected to a Macintosh IIci using 4 Mbytes of RAM and running under System 6.0.7. The computer lab consisted from two Mac Ci, one Microtek slide scanner and one Microtek flatbed scanner ScanMaker 600ZS. One Macintosh LC was also involved for text processing and back-up was carried out using an external 250 Mbyte hard disk together with a 90 Mbyte Bernoulli drive. The slides were digitised at a rate of 15-20 slides a day. It must be stated that the digital images were colour corrected by direct comparison to the original items in the museum.

Programming

Screen resolution was a critical issue which was decided quite early during the development and well before buying the equipment. The VGA resolution of 640x480 was decided as the optimum solution within the available budget, storage and processing requirements. Since a future creation of a CD-ROM connected to a low cost machine was envisaged, tiding the development in a higher resolution simply meant new development for a CD-ROM product.

The selection of Macintosh as a platform was carried out for the following reasons:

- Many PC development platforms are not reliable. It is unacceptable to have computer crashes while using a POI. Besides most multimedia applications in museums have been based on Macintosh (for example Micro Gallery at the National Gallery).
- The Macintosh combines the ease of use together with a friendly interface which was accepted positively by the inexperienced archaeology researchers.
- Programming was carried out on HyperCard.

HyperCard has been developed for the Macintosh. It is the first product with true multimedia capabilities. It runs on all Macintosh products and has been extensively tested.

Programming in HyperCard has restrictions, the most important of which is the use of colour. It is possible to display colour pictures on Macintosh using external commands. In order to incorporate colour the package *Colorising HyperCard* by BungDabba Productions was also involved. Using the tools of HyperCard it was possible to satisfy most of the user requirements. The actual development of the software was covered over a period of 2 months; however there was accumulated experience using HyperCard from the programmer.

The graphics were restricted to top views of the museum rooms. The digitisation was carried out using an Océ digitising board directly from museum drawings. The screen layout did not employ any special graphics.

Every single screen of the guide has a help button. The navigation buttons are clearly marked on any screen.

Since most of the museum items are displayed rather as *portraits* than *landscapes* the navigation buttons were put in a vertical row at the left of the screen. The same convention was kept for all screens.

Prototype design and implementation

General structure of the guide:

After the attractor loop, and one information screen the user enters the main menu screen where he/she is faced by four choices: **Where is Dion?**, **The Guide of the Museum**, **Enquiries with keywords** and **Exit**.

The guide of the museum button eventually leads to a top view of each floor. Each room uses a different colour code. Any selection of a room leads to the top section of the selected room. By leading the cursor on an item location, the location number highlights and the items titles are displayed. By selecting the highlighted number, the user is introduced to a database of the items. During the first stage, the typical item screen had the following layout (Fig.2). The prototype did not involve any database enquiry facilities, since the necessary text was not ready in time.

Fig.2 Initial design of screen layout

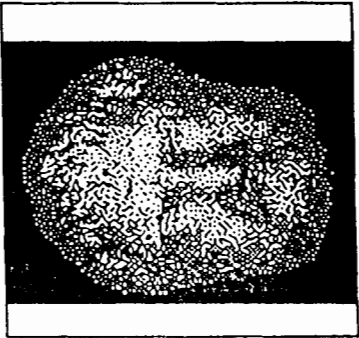

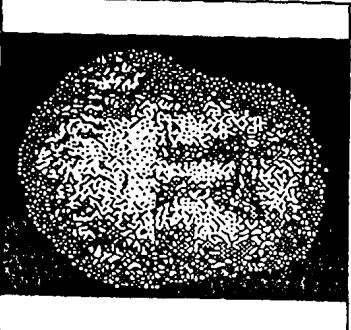
Μεγάλες θέρμες	<p data-bbox="311 787 375 1585">Βάθρο 6: Εκθεμα 2 από 2</p> <div data-bbox="379 1402 737 1738">  </div> <p data-bbox="518 682 566 1386">Ανδρικό ρωμαϊκό πορτραίτο.</p> <p data-bbox="726 672 837 1596">Περιγραφή: Το πορτραίτο αποδίδει σίγουρα τον ίδιο άνδρα με το 6.1 και λειτουργεί σαν πρότυπο του τελευταίου.</p> <p data-bbox="1173 1407 1396 1690"> Μέγιστο ύψος: Μέγιστο μήκος: Μέγιστο πλάτος: Υλικό: Μάρμαρο Τόπος εύρεσης: Μεγάλες Θέρμες. Χρονολόγηση: </p>
Βοήθεια	
Μεγένθυση	
Κατάλογος 	
Τόπος εύρεσης	
Προηγούμενο	
Επόμενο βάρθρο	

Fig.3 Final design of screen layout with graphical interface

Βάθρο 6: Έκθεμα 2 από 2



Ανδρικό ρωμαϊκό πορτραίτο.

Περιγραφή: Το πορτραίτο αποδίδει σίγουρα τον ίδιο άνδρα με το 6.1 και λειτουργεί σαν πρότυπο του τελευταίου.

Μέγιστο ύψος:
Μέγιστο μήκος:
Μέγιστο πλάτος:
Υλικό: Μάρμαρο
Τόπος εύρεσης: Μεγάλες Θέρμες.
Χρονολόγηση:

Μεγάλες Θέρμες

?

Αντικείμενο

Αντικείμενο

Αντικείμενο

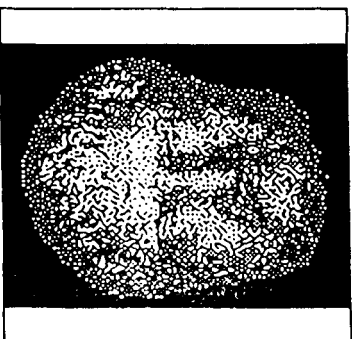
Αντικείμενο

Αντικείμενο

Αντικείμενο

Fig.4 Design of screen layout. Detail of interaction

Μεγάλες Θέρμες
?
Κατάλογος

<h2>Βάθρο 6: Έκθεμα 2 από 2</h2>  <h3>Ανδρικό ρωμαϊκό πορτραίτο.</h3> <p>Περιγραφή: Το πορτραίτο αποδίδει σίγουρα τον ίδιο άνδρα με το 6.1 και λειτουργεί σαν πρότυπο του τελευταίου.</p> <p>Μέγιστο ύψος: Μέγιστο μήκος: Μέγιστο πλάτος: Υλικό: Μάρμαρο Τόπος εύρεσης: Μεγάλες Θέρμες. Χρονολόγηση:</p>

Revision and final design

The initial prototype guide was shown to archaeologists with little experience in computers. Experienced computer users were also approached to test the efficiency of the design. After a small briefing in using the mouse and interacting with the computer, each user was free to play with the guide. Their attitude was monitored closely and the remarks were recorded. In most cases users reacted as expected; however whenever they hesitated for the next selection the screen was marked and hints for the next step were added.

Generally the users did not employ the help button although they were told at the beginning about its use. After understanding the basic structure of the program they were able to navigate easily by repeating their actions. An interesting point is that experienced Macintosh users kept clicking the mouse twice (double clicking was always trapped).

Feedback from other evaluators suggested to add graphical orientation to the general screen layout of Fig.2.

After revision of the original design, the layout of Fig.2 was transformed to that of Fig.3. Whenever the cursor entered a button area, the underlying action was displayed by hiding the corresponding graphical information (Fig.4).

Incorporation of an item database

The database enquiry part of the menu was built using lookup tables in a heuristic way. The user selects either a name or a category within a scrolling field. If there are subcategories available they are displayed for further selection. If there are no subcategories then the number of found items are displayed together with the corresponding labels. The user can view any item by selecting it. It must be stressed that this is a custom based database and any change leads unavoidably to the redesign of the thesaurus and the corresponding lookup tables.

The experience of the team working together revealed the importance of the following issues within a multimedia development team.

- A good understanding of the limitations and the exact role of each partner.
- A good understanding of the limitations of the technology and the need to adhere to the available budget.
- Adequate balance between hardware investment, software development and human resources. None of the three parts should be underestimated.
- Designing for interactivity: if the user hesitates in front of a screen or he/she feels lost it is usually the fault of the programmer. It is important to try to identify the source of malfunction and change the interface accordingly in order to ease the navigation.

Our experience had shown that if there is a clear and honest relationship between all members, good will in resolving sensitive and delicate issues, respect of the copyright and of the work of all parties, there is a good chance of producing satisfactory results even within restricted budget.

As a general indication we note the following overall costs of the project:

Manpower: Archaeologists: 10 man months, Programmer: 5 man-months, Project co-ordinator (professor): one man-month.

Hardware: 1 Macintosh LC, 2 Macintosh IIfx, 1 flatbed scanner, 1 slide scanner, 1 laser printer, 1 Océ graphics digitiser, 1 Bernoulli, External storage (1 230 MByte Hard Disk)

Software: HyperCard, Photoshop, MacDraw II.1, Microsoft Word

Consumables: Film, photocopies, floppy disks, Bernoulli cartridges

External Services: Photographer. The guide is currently working on a Macintosh LC II in the museum.

Since the project was running in parallel with another multimedia production, the actual costs were lower. Besides, both projects gained from reusing developed code and interactivity design.