

# DIGITAL MANAGEMENT OF THE DOCUMENTATION OF THE ACROPOLIS RESTORATION

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## ABSTRACT:

From the outset, the Committee for the Conservation of the Acropolis Monuments (ESMA) has paid particular attention to the meticulous documentation of the interventions in all their phases. The constantly increasing number of the documentation led already in 1988 to the first efforts for a computerized management. The data base currently in use allows the image management of the documentation and organizes the data on the basis of the architectural members of the monuments. The database is made up of the following archives: a. The archive of the architectural members of the monuments, which comprises information on the identity of the member, its special structural features, the historical traces left on it, previous restorations and the contemporary interventions, the characteristics of and the conservation interventions on the surface of the member, b. The archives of the documents themselves (photographs, drawings and texts), with the digital image of the document and the necessary relevant information. The archives are inter-related, so that each member can be accompanied by all the relevant documents. As an important feature of the database, the ability to correlate the documents with every piece of information that is described in the archive of the architectural members is noted. In the near future is planned the introduction of the documentation of the completed interventions to the Web.

## INTRODUCTION

The documentation of the interventions on the monuments is one of the basic prerogatives of the Venice Charter of 1964. Article 16 expressively states that *in all works of preservation, restoration or excavation, there should always be precise documentation in the form of analytical and critical reports, illustrated with drawings and photographs. Every stage of the work ... should be included. This record should be placed in the archives of a public institution and made available to research workers. It is recommended that the report should be published.* The Committee for the Conservation of the Acropolis Monuments (ESMA), following the principles set by the Venice Charter in its interventions, paid, since the beginning, particular attention to the meticulous documentation of the works in all their phases. Furthermore, the documentation process has been directly associated to the theoretical principle of reversibility of the interventions, which the Committee has adopted since the beginning of the Acropolis restoration project. Reversibility means that contemporary works must not interfere with the possibility of future interventions for improving the monuments. Reversibility should also, as far as possible, make today's work obvious and comprehensible to future generations. One of the main means to achieve this is the fullest possible documentation of the work, its fullest publicizing and transparency as well as its final publication.

The documentation of the interventions comprises records in day-books and, above all, drawings and photographs. The drawings consist of surveys of the state of preservation of the monuments before and during the works, plans and drawings of work-site installations and mechanical equipment and of what is called the "files" of the dismantled architectural members of the monuments, which are under conservation. Each "file" comprises detailed surveys of the member, where all the modern interventions – the new metal reinforcements or marble additions to the member – are recorded, the plotting on transparent sheets of the damaged areas of its surface and the

recording of the surface conservation interventions (e.g. the joining of fragments and flakes, the filling of cracks and joins or the surface consolidation). The recording of the works is completed by photography and cinematography.

Since the beginning of its function the ESMA has organized a systematic Archive [the actual Documentation Office of the Acropolis Restoration Service (YSMA)], in order to gather, to keep and to inventorize the documentation which is produced. In the Archives has also been gathered information about the older interventions on the Acropolis monuments (e.g. bibliographical references, old photographs, copies of reports and other documents from other archives). Furthermore, the archives comprise a data base of all the (unpublished) studies and reports (1725 entries), produced by the archeologists, architects and engineers in charge during the works, on the basis of which the interventions are being carried out.

## THE FIRST DATA BASE

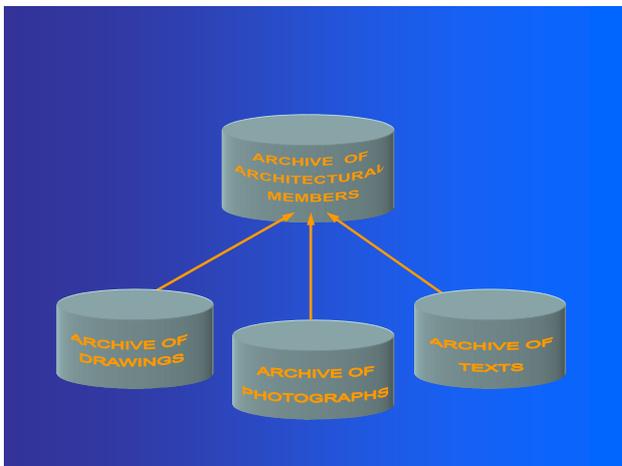
By 1987 already, when restoration work on the Erechtheion had been finished, the documentation compiled was enormous. It was evident that this collected information must be available and accessible by automated means. Then the software *Sigmini*, a computer programme that had been developed by the École des Mines de Paris and the Union Minière of Belgium was used for establishing the first data base for documenting the Acropolis restoration works. *Sigmini* was chosen in 1987 because with it a single data base could be created, that could handle all types of documentation, providing a graded organization together with associated information. The data base for documenting the restoration of the Erechtheion was established with the *Sigmini* programme (6,000 photos and 500 drawings).

For the computerization of the documentation of the rest of the Acropolis works, it was decided to change the software. The

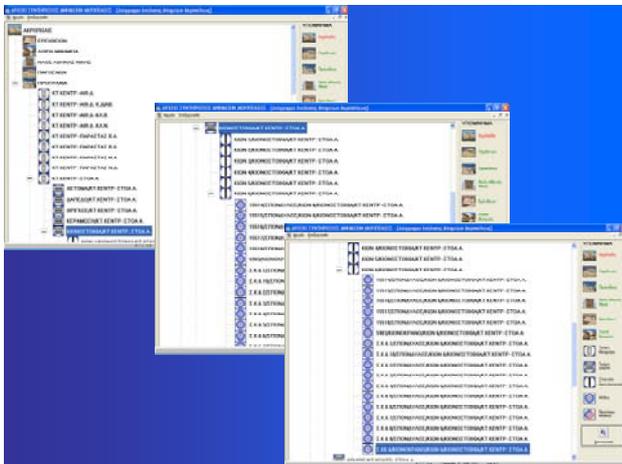
reason was that *Sigmini* – a university programme, which has not been developed further ever since – could not be adjusted to the new possibilities provided by the further developments of computers, the data bases of which could now handle images and graphic material in a windows environment. The new application aimed at the creation of a unified data base, based on the analysis not of the documents any more (as in the previous one) but of the monuments themselves and on information from the restoration documentation, which is directly connected with the architectural members of the monuments.

### CURRENT APPLICATION

The new data base (*Esmatool*), developed in 1996/7 by the Athens Technology Center (ATC), comprises four main interconnected archives, those of architectural members, photographs, drawings and texts.



The archive of architectural members is arranged in hierarchical order going from the whole (“the monument”) to the separate unit (“the architectural member”). The in-between grades correspond to the division of the monument in the vertical sense (nominated “the part of the monument”, such as pteron, pronaos, opisthonaos, cella etc), to its division in the horizontal sense (nominated “the structural part”, such as crepis, colonnade, wall, entablature etc.), to the grouping of similar architectural members (nominated “the architectural element”, such the stylobate, toichobate, course, epistyle, cornice).



In the archive of architectural members every entry is accompanied by groups of thematic sections describing: the architectural member and its position in the monument as a whole; the characteristics of its construction; the preserved traces of its history; the preserved traces of earlier interventions; features and damage on the surface of the marble; the present structural restoration of the architectural members; the conservation works on the surfaces of the monuments. The archives of photographs and drawings apart from the usual analyses and documentation, include also the pictures of the documents in digital form.



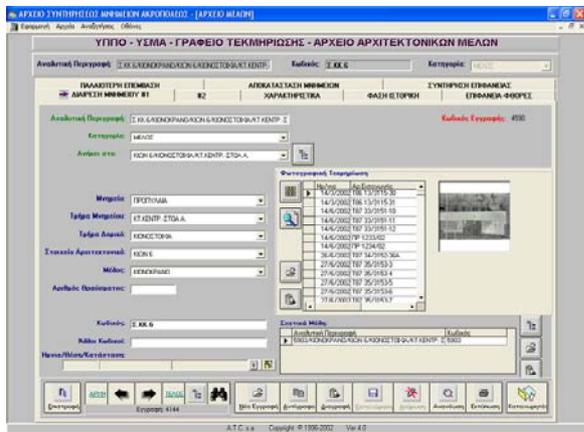
These archives are directly connected with the archive of architectural members. With the correlating ability of the programme, all kind of documentation – either photograph, drawing or even text – according to its contents, can be associated with every bit of relevant information in the above thematic sections.

The advantage of the new organization of the data base is evident, since it can present the architectural members or larger sections of the monuments together with their entire documentation held in the data base, both as picture and as information. Thus, the documentation entered in the computer is directly related to the performance and development of the interventions. The data base itself becomes a powerful tool for monitoring and supporting the works, useful for both engineers and conservators. As examples, some of the possibilities of the data base are: immediate retrieval of information (together with relevant pictures) connected with existing photographic and

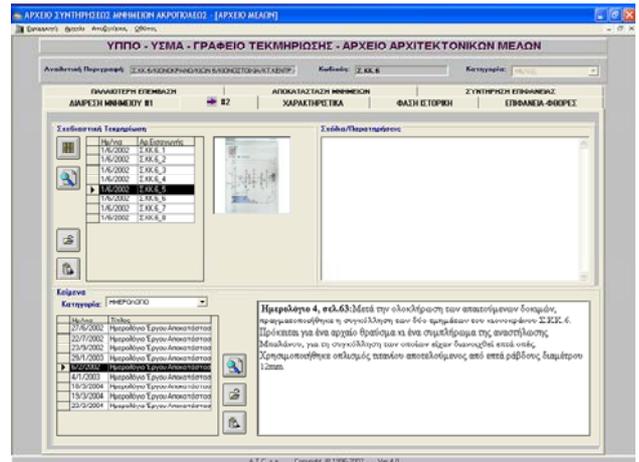
graphic documentation of the members, monitoring stages – whether complete or in process – of the interventions on members receiving conservation or structural restoration, immediate retrieval of information about particular structural features and damage to architectural members; all these data are of basic importance in putting together the studies for intervention on the monuments.

Let's see now an example of a recording of an architectural member, specifically of a Doric capital from the east portico of the central building of the Propylaea. The record contains the following information organized in eight thematic groups, which is presented in eight different screens:

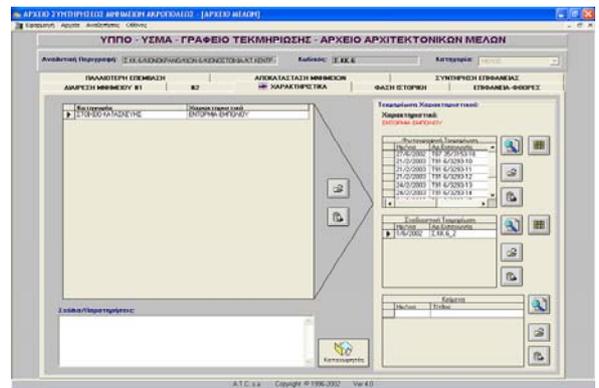
1. Description of the architectural member: it comprises the member's code number as well as information about the identity of the architectural member (description and specific position within the whole monument). The screen comprises also a catalogue of the available photographs of the member with the corresponding digital pictures.



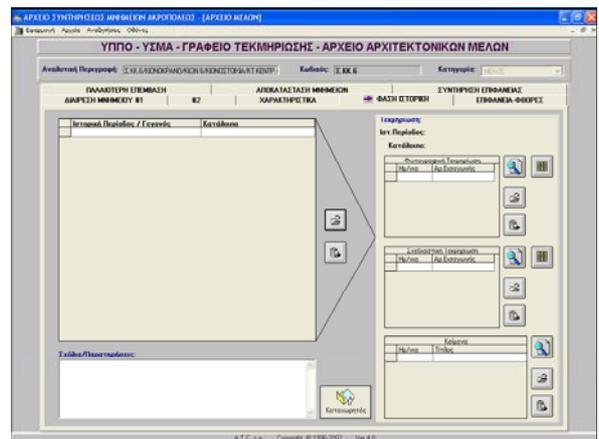
2. Graphic and textual documentation: it comprises a catalogue (with corresponding digital pictures) of the available graphic documentation of the architectural member (with the inventory numbers of the ESMA Archives and the date of the drawing), information on the scale and the material of the drawing as well as a description of the member depicted (subject of the drawing). The screen also presents a catalogue of the relevant texts (work daybooks, proceedings of sessions of the Acropolis Committee, reports, bibliography, etc.).



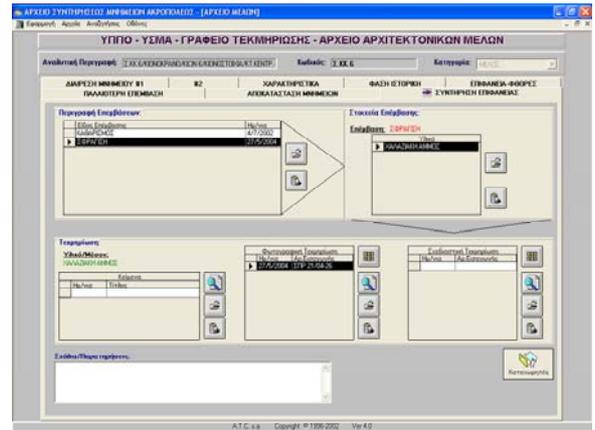
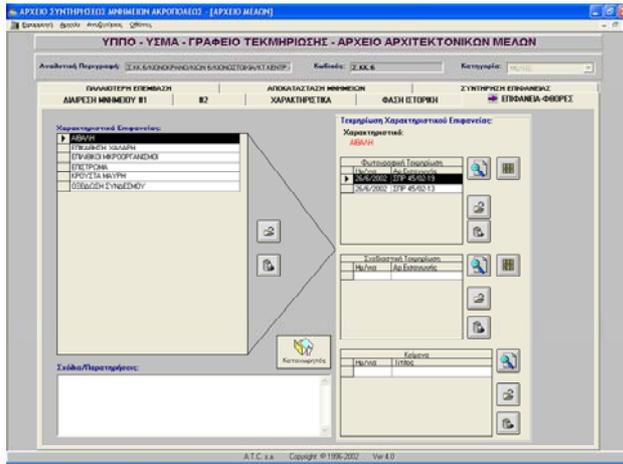
3. Characteristics: it comprises information about particularities of the original construction of the architectural member, such as surface elaboration, constructive elements (clamps and dowels), sculptural ornamentation, polychromy and painted ornamentation, construction material.



4. Historical phases: it comprises a catalogue of the main historical phases (for ex. Byzantine period or Ottoman occupation) or events (for ex. explosion of 1687) and the traces left by them (if any) on the architectural member of the monument.

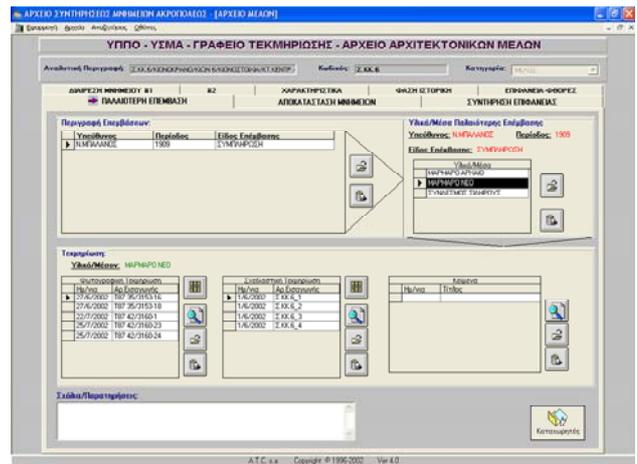
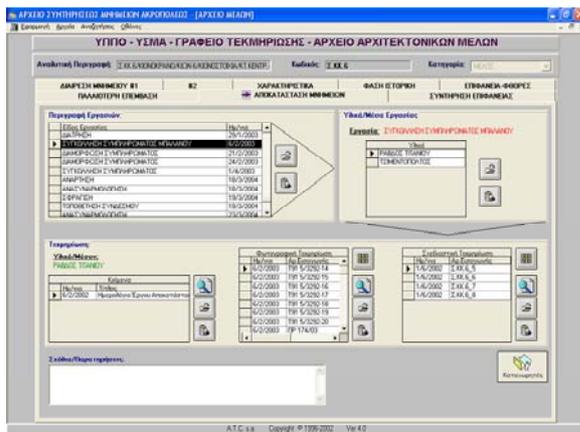


5. Damage on the surface of the marble: it presents a full catalogue of the damage phenomena (for ex. biological attack, mechanical and chemical deterioration, etc.) as well as of the relevant traces identified on the surface of the architectural member.



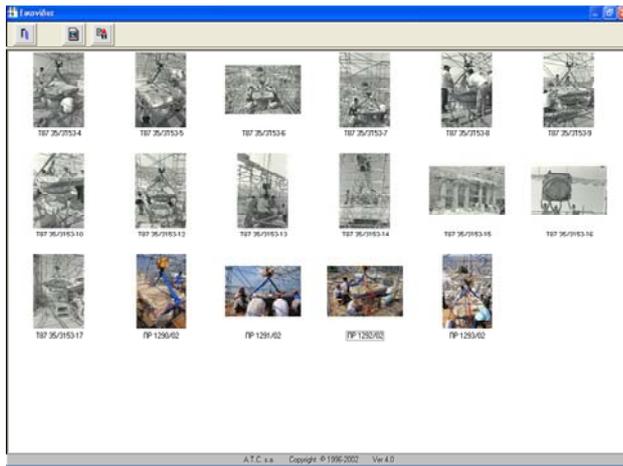
6. Restoration works: it comprises a catalogue of the various interventions (for ex. dismantling, filling in, resetting, etc.) that are currently carried out on the architectural member followed by the specific date of each intervention as well as by the means (for ex. rods, clamps, pointing device, etc.) and the materials (for ex. titanium, Pentelic marble, silica sand, etc.) that have been used.

8. Previous interventions: it comprises a catalogue of the older restoration interventions (for ex. by K.Pittakis, by N.Balanos, etc.), whose traces can be identified on the specific architectural member. This information is followed by the exact date of the intervention, the type (for ex. insertion of metallic reinforcement, joining of fragments, etc.), the means (for ex. double T beams) and the materials (for ex. iron, cement, etc.), that have been used.



7. Surface conservation works: it comprises a catalogue of the conservation interventions (for ex. injection grouting, sealing, impregnation etc.) performed on the surface of the architectural member followed by the specific date of each intervention as well as by the means and the materials (for ex. titanium, white Portland cement, lime, lime-water, etc.) that have been used.

In all the above thematic groups/screens every piece of information is combined with the totality of the available, in the base, documentation, either graphic or photographic, which is presented in the form of a catalogue, which comprises the date and the Archives' inventory number of the document. All the available in the base documents can also be presented on the screen in the form of thumbnails, while every record and document can be presented in the form of a large scale image.



architectural member will be performed from an active elevation drawing of the relevant façade of the monument, which will appear on the P.C's screen, and will lead directly to the relevant information records. As far as it concerns the Erechtheion, whose restoration has already been completed, the access will be performed through a 3D model of the monument. Finally, applications development is programmed, in order to make accessible the data base information through the Web.

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In order to make full use of its possibilities the data base has been installed at the work-sites of the Acropolis and, in 2001, archeologists were hired with the aim to insert information acquired during the interventions, as they progress, from the work day-books and the newly produced documentation. The fact that the archeologists are based on the work-sites of the Acropolis monuments enables the direct and immediate data entry to the base. Such installation of the data base was made possible by connecting the work-sites technical offices of the monuments on the Acropolis Rock to the Central Archives at the YSMA offices down below. Actually (spring of 2007) the data base of the documentation of the Acropolis restoration project comprises in total 67,550 records, i.e. 8,700 architectural members, 4,350 drawings, 54,500 photographs.

The function of the data base so far has responded to the expectations of its users. Despite the fact that the degree and the quality of the analysis of the information, which is inserted in the base, depends on the commentary of the document done either by the scholars who produce or study it or by the person in charge of its entry to the data system, the retrieval of the data untill now has been proved very effective.

### FUTURE PLANNING

In relation to the further development of the information system, the replacement of the current data base by a new one has been planned. The data and its organization in the data base will be transferred to a new graphical environment, which will provide new ways of access to the documents: the selection of the

