# A SPECIAL INFORMATION SYSTEM FOR THE DOCUMENTATION OF CASTLES

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ISPRS Commission V

**ABSTRACT:**

Castles are of great importance for Greece. Their sound documentation can only be achieved by combining properly photogrammetric methods to special Information Systems for the manipulation and storage of related alphanumeric,graphical,digital and imagery data. By using the most affordable possible solution for hardware and software, an application for the documentation of a large Greek castle, named Acrocorinth, was tested. The information which was included into the system is given and the requirements in storage capacity for a variety of outputs are described. It can be concluded that such a system can be established with modest amount of funds, manpower and time and that the influence of it on the management of monuments will have a considerable effect.

**KEY WORDS:** Archiving, Castle, Archaeological, G.I.S., Data Base, Documentation

## 1. INTRODUCTION

The Laboratory of Photogrammetry of NTU under the instruction of the Arcaeological Society of Athens is involved in a ten-year project of establishing a system for the documentation of Greek Castles mainly the Medieval,Venetian and Byzantine.

This system will contain every information that could be collected from all existing sources for each Castle as well as new information, e.g. photogrammetric restitutions, mosaics, baloon photographs, new surveys, 3-D plans.The additional information will be produced mostly by the Lab. of Photogrammetry as well as other agencies.

Although archaeological and architectural restitutions of monuments have undergone considerable developments and improvements over the years, they have generally been developed independently from each other isolated to a great extent from other activities related to each.

Unfortunately, due to the lack of collaboration and interdisciplinary cooperation, the products of the various scientific approaches to a particular monument are usually scattered and extremely difficult to collect and use efficiently. Even more difficult is the collation and modification of the enormous amount of existing information arising from various sources for many practical reasons: e.g. matters of scales, reference frames etc. Many countries and institutions have already tried to face up to the problem by organising systematic archives related to monuments.

The modern alternative answer is the creation of a Special Information System (S.I.S.). The structure of such a system would be complicated and very critical for its success. It could be established at a local level, especially in countries with many monuments, or at a district or national level.

The proposal put forward by this paper is the establishment, in Greece, of a S.I.S. containing the documentation of Castles. This is of national importance for the simple reason that previous archaeological activities in Greece have, over the years, tended to focus on classical and pre-classical monuments and castles-usually medieval; Venetian and Byzantine taking a very second place. For this reason, the documentation on castles is extremely limited, but they can, on the other hand, unlike other antiquities, serve a positive modern purpose as tourism or recreation centres etc. Presently, conference centres, research facilities, even prisons are making full use of suitably adapted castles.

The special I.S. of the Castles is PC oriented for practical reasons, with the possibility of free expansion of memory, H/W and S/W. The system used consists:

- as far as hardware: a PC 386 (Compaq Deskpro 386/25e) with 200 Mb hard disk,connected to a digitizer (Calcomp 9100) and a scanner (EPSON GT-6000) for the collection of information from existing maps or images, a Stereocord G2 and a VMAP-Digital Mapping System for photogrammetric restitutions; it is also connected to a printer and a plotter (Calcomp 1044) as output devices

- as far as software: a PC ARC/INFO version 3.4, which is a general G.I.S. package, with DBASE IV for data base and AutoCAD for editing of analytical photogrammetric restitutions or other digitized data.

## 2. INFORMATION CONTAINED IN THE S.I.S.

The decision for the information which will be included and processed by the system is very important, because, to a great extend, will give the character and the efficiency of the system. The final answer on this question will be defined after long cooperation with all authorities who are expected to use the system.

As a first approximation the following groups of recorded information are identified:

1)General information
location of the monument, administrative information, access possibilities, land use, ownership, meteorological data

2)Historical information
dates of constructions, occupation periods, battles, important visits, dates of restorations and interventions

3)Publications
books, reports, manuscripts etc.

4)Images
post-cards, photographs from amateur or metric cameras, pictures taken during excavations, aerial photographs, images from other sensors, video tapes etc.

5)Measurements
topographical, architectural and technical measurements, surveys, maps, coordinates, D.T.M., plans and surveys of restorations and interventions

6)Archaeological information
archaeological studies, information related to archaeological excavations, such as dates, chief archaeologists, lists of photographs and plans, main findings, results

7)Architectural infrormation
style of constructions, masonry, style of columes etc.

8)Technical information
building materials, wheels, water tanks, bridges, quarries, pedological, geological, utility networks

9)Caltural information
languages spoken, fairs, population etc.

10)Pieces of art
ikons, statues, idoles etc
and surveys of restorations and interventions

The information is recorded into files following the classification mentioned above. Each Castle has a code number; the first part of it declares the region, the second part the prefecture and the third part the number of the Castle. This code number is the key code to each file.

The system permits the use of either raster or vector data form, depending on the source the

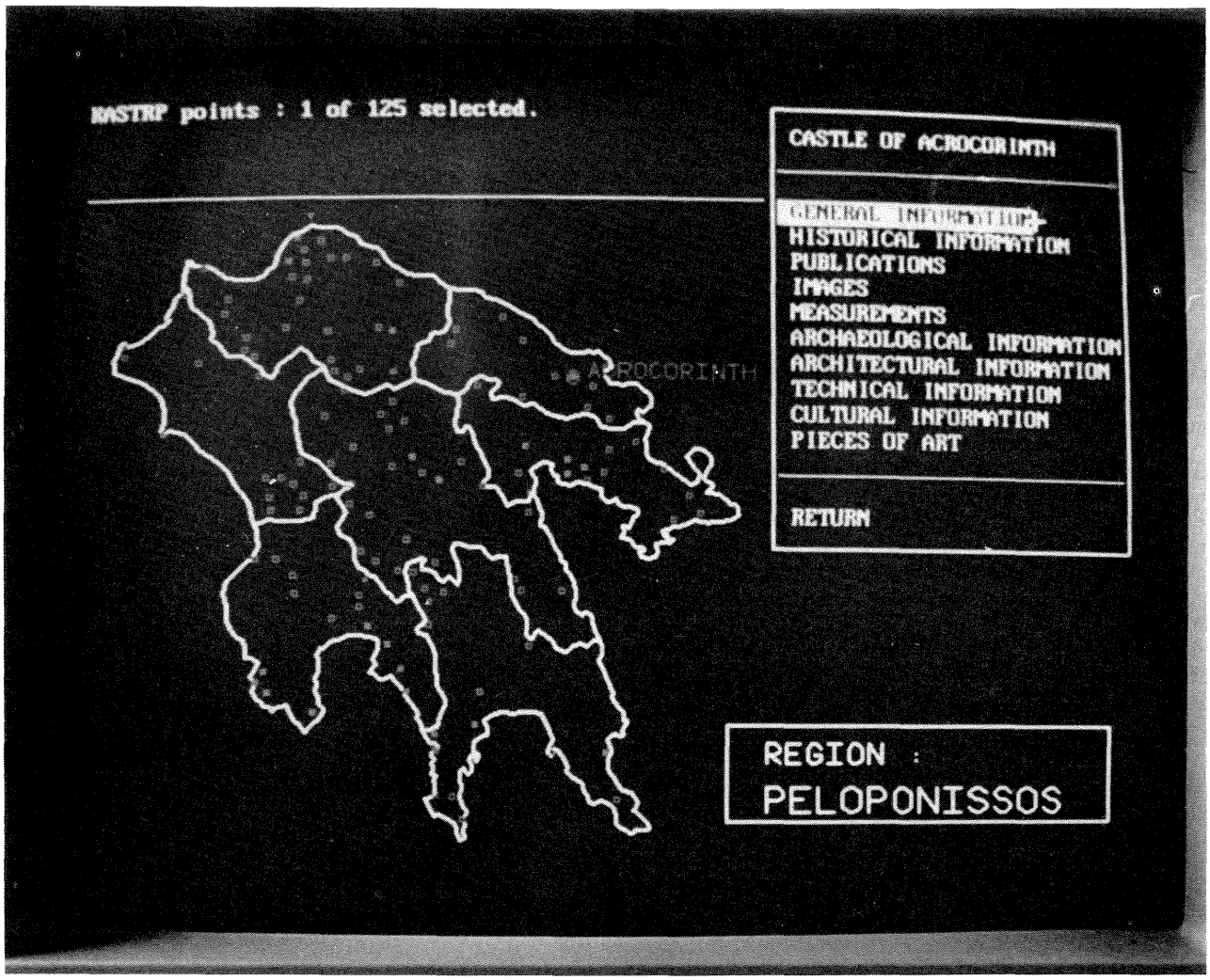


Fig. 1

information is derived from. The input of scanned pictures or photographs is decided to be limited at the time being, e.g. one or maximum two pictures for each Castle and only in special occasions more than that. It is mentioned here that for a picture 10x10cm scanned at 300 dpi a storing space of about 1.4 Mb is needed. In the future, an optical disk that will be loaded on the computer, will permit a larger number of raster pictures to be stored into the system.

The editing of 2D or 3D graphical information, where necessary, is obtained by using AutoCAD package and the final products are transferred into the special Information System.

## 3. STRUCTURE OF THE SYSTEM

The user can enter into the system, working in ARC/INFO environment, in two ways:

a)by asking for information related to a single Castle
b)by selecting queries related to more than one Castle.

When a user is interested for information related to a single Castle can either obtain information as listed in the ten groups mensioned above or combined information selected from queries menus.

The information is structured in such a way in the system, that the user can start from every group and proceeds to any record of interest, continuing to a more specified graphical, alphanumeric or image information. The user could reach these elements by starting from any related group. It is obvious that every piece of original information is stored only once.

To withdraw information of a particular attribure related to more than one Castle, the user follows a procedure of selecting queries through succesive pop-up or other menus containing all type of information (archaeological, historical, spatial e.t.c.) or certain combinations of that. For example, a certain kind of question can offer information related to dates (e.g. *Which Castles were built in the 18th century*), or positioning (e.g. *The Castles of Crete*), or combined information (e.g. *The Castles of Peloponissos that were occupied by Venetians*) e.t.c.

## 4. APPLICATION

Some examples of the operation of the special Information System are given below. For that purpose we follow a user who is interested in acquiring information for a Castle of Peloponissos.

The user first obtains from the system the map of the region with all the existing Castles marked on it. The Castle of Acrocorinth is selected, which is the oldest Castle in continous use in Greece after the Acropolis of Athens; it is found southwest of the ancient city of Cotinth.

By selecting the particular Castle, the user obtains the menu with the ten groups, as shown on Fig. 1.

On Fig. 2 we have a typical example of an output in a form of alphanumeric list. This is the first screen of the answer of the system to the selection of group "General information".

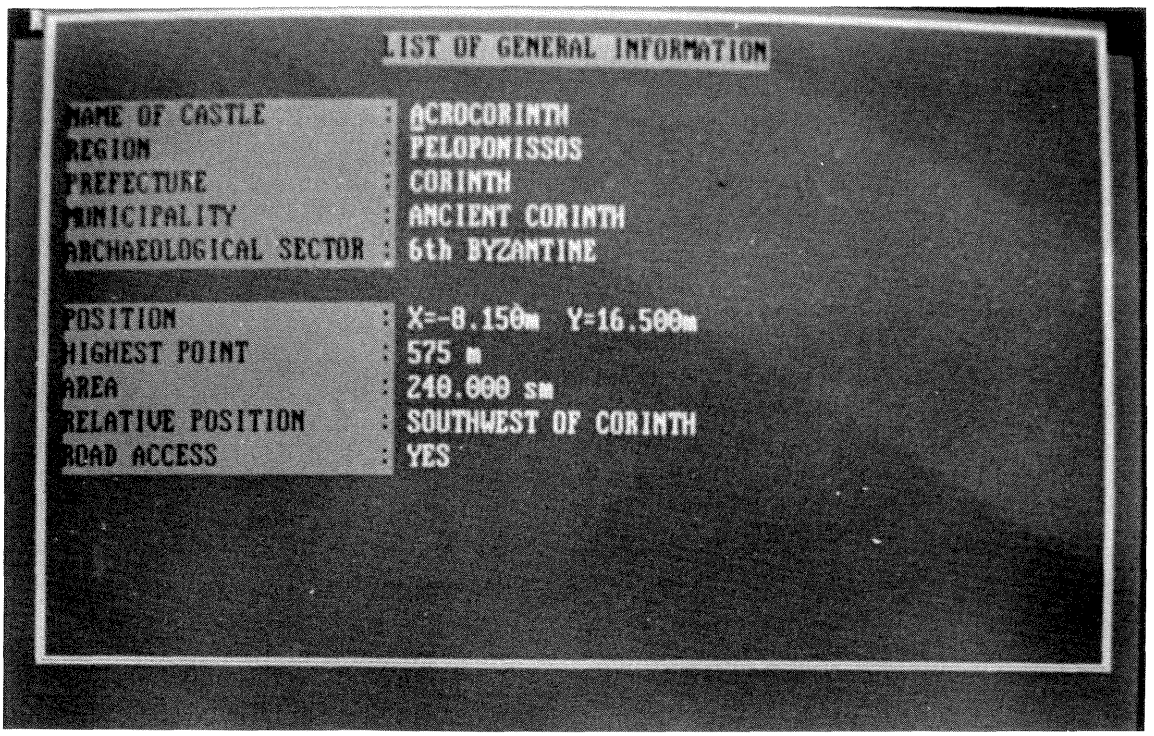


Fig. 2

An example from the group of "Images" is given on Fig. 3, where an old drawing of the Castle was scanned and inserted into the system.

On Fig. 4 we have a graphical output in vector form, selected from the group of "Measurements". It is a photogrammetric restitution of one of the three Gates of the Castle (excecuted by the Laboratory of Photogrammetry of NTU of Athens and completed a short time ago).

An example of an output of combined information is shown on Fig. 5. It has been produced by the system using:
- the hight information of the state map of a scale 1:5000
- the planimetry from an archaeological survey of the Castle, performed in 1931 at a scale 1:1000 and
- the positions of the wall where interventions were made between 1200-1821 (information contained in /Theodorou et al 1990/).

## 5. CONCLUSIONS

New technology gives more efficient tools for studying, protecting and managing our monuments. Hardware and software demands for this application are becoming more common, easy to operate and affordable.

The expected benefit from the use of these systems is great, especially for a country which has such a wealth of monuments but a low organisational level and thus has a tremendous task to undertake. The state has the means to introduce such systems. Thus the next important step is its decision to initiate and fuhd a complete system such as the one envisaged in this paper.

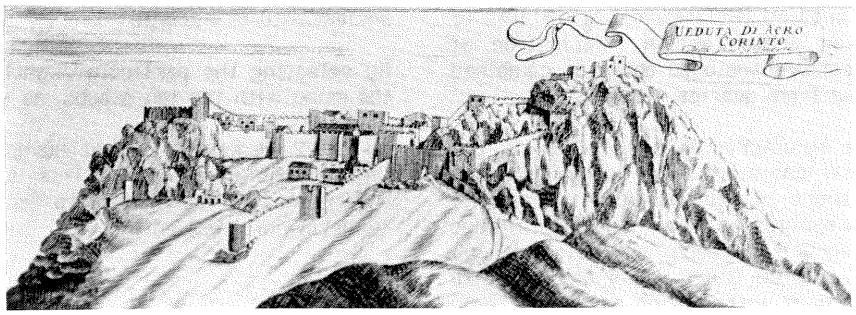


Fig. 3

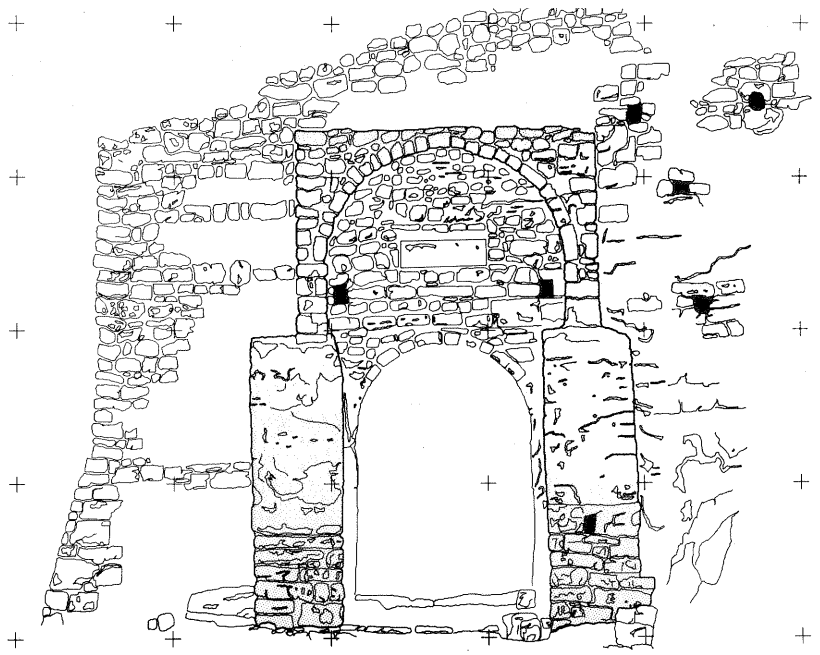

Fig. 4

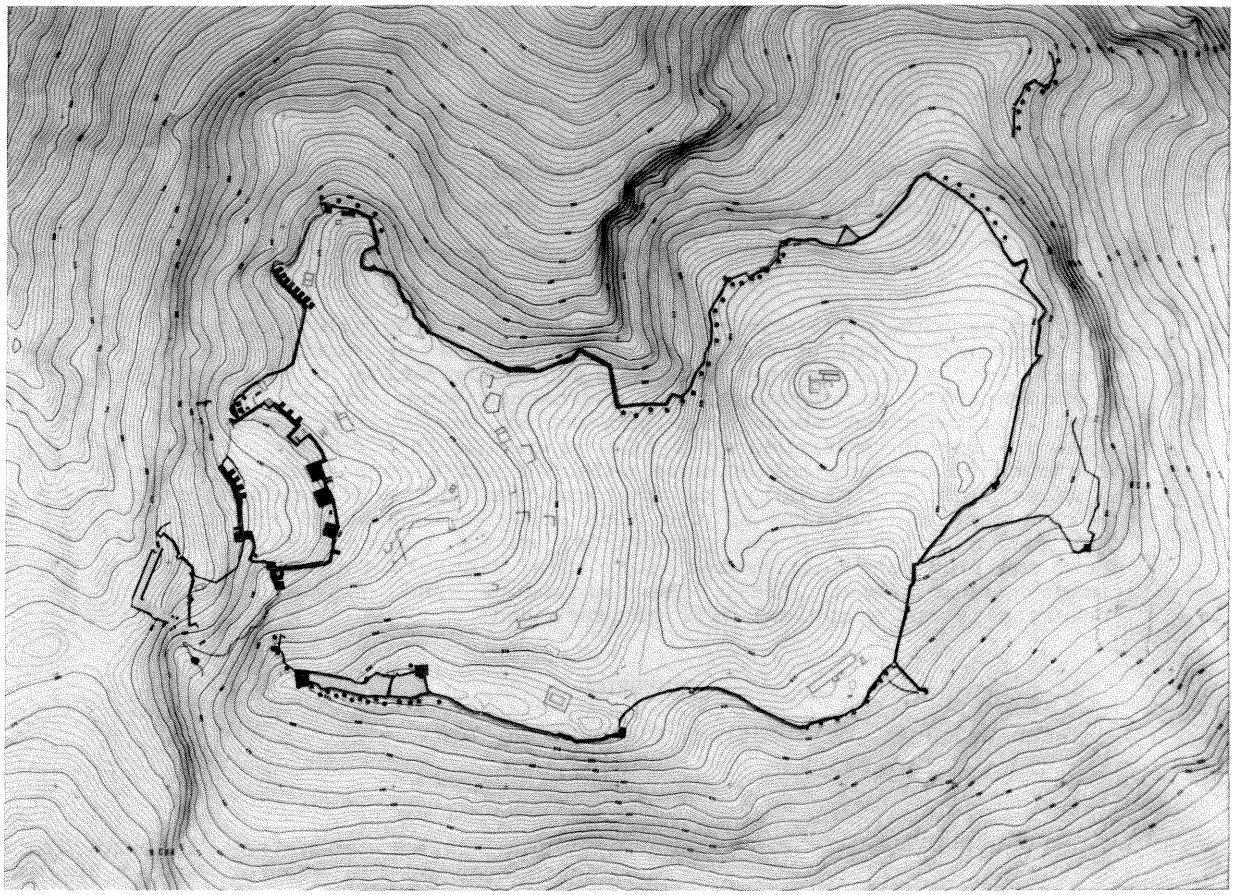

Fig. 5

Acknowledgments
To C. Logothetis graduate student of NTU of Athens, we owe thanks for his contribution to the structure of the proposed I.S.

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