Using a Relational Database Management System for the Recording of Ancient Settlements and Sites in the Vrachneika Territory in Western Greece

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Abstract

During the study of the local history and archaeology of western Achaia, Greece, by the workgroup of Landscape Archaeology Group (LAG), an Access 97 database application was used for the recording of archaeological sites throughout the territory of the modern villages of Vrachneika and Monodendri. The application was characterized by its advanced capabilities regarding the types of data entry, such as topographical maps of the sites, pictures of the finds, indexing of the related bibliography, etc. Other components include the capacity to implement a select data research, for example of sites with the same chronology, or sites with similar finds. Some quantitative remarks concerning the numerical data were also attainable with the use of statistical graphs. Finally, all the data entries of the sites may be printed in reports or accessed through other software applications (Word, Excel etc.) for advanced processing.

Key words: Access, relational database, database application, landscape history, historical sites, landscape archaeology group, cultural data management and retrieval

1. Preface

Since 1995, a non-profitable scientific society in Greece, called the Landscape Archaeology Group (L.A.G.), has been investigating the history of the western part of the Achaia province in the northwest Peloponnese.[1] The Landscape Archaeology Group was founded in an attempt to accomplish the following four goals:

1. To contribute to the preservation of the historical landscape and the historical memory.
2. To awake the historical memory and consciousness of the native population.
3. To encourage interdisciplinary co-operation, not only among Group members but also in the wider research field, for the advancement of archaeological research.
4. The exploration, promotion and support of modern techniques and, in general, of a new strategy that will correspond to the research notion of our times.

The means used by the Group to achieve its goals are field surveys, implementation of historical, archaeological, anthropological, environmental and social studies and the publication of a scientific Newsletter, as well as individual studies, such as monographs and articles in scientific journals.

2. LAG's background and present studies

Our work in Achaia began as early as 1991, with the participation of some Group members in an interdisciplinary study of the historical topography of Achaia, a project supervised by the National Hellenic Foundation of Research and the local branches of the Archaeological Service (Papagiannopoulos and Zahos 1994, Zahos et al. 1995, Tsakirakis 1996, Andrinopoulos 1998, Simoni and Papagiannopoulos 1998, Andrinopoulos and Simoni in press, Zahos and Papagiannopoulos in press). After this initial step and the foundation of the society, the Landscape Archaeology Group started to develop an interest in the recording of the local history of western Achaia. This interest was partly in response to the concern of local mayors and community council members regarding the establishment of historical documentation of their towns and villages. Since 1996, our society has given lectures and organised exhibitions relating to the cultural identity and history of the local communities. From the beginning we have focused on the diachronic unity of a geographic area subjected to human intervention. This is our Group's main methodological approach, as we believe that the landscape consists of a combination of natural and man-made characteristics. During successive historical periods, settlements and human exploitation leave marks of cultural intervention on the natural landscape. When looking into the human past of a specific area, attention must be paid not only to historical testimonies and archaeological finds, but also to the study of the natural landscape in all its aspects. This can be attained with the contribution of the natural and environmental sciences, like geology, chemistry, forestry and geography. When such a combination of disciplines studies all landscape components, local history can be apprehended in detail.

At the present time our workgroup for the study of the cultural landscape of western Achaia has completed its work regarding two communities, Agiovlassitika and Kareika. The result of these studies was the writing of two books of history (Argyropoulos et al. 1998, Papagiannopoulos and Chronopoulos 1998). Since 1998, the city council of Vrachneika, a newly founded municipality in western Achaia, has assigned to our society's workgroup an ambitious project for the documentation of the diachronic history of the area within the modern town's administrative boundaries. An essential part of the project was the study of human settlement and intervention in this area, a task partly undertaken by the author.

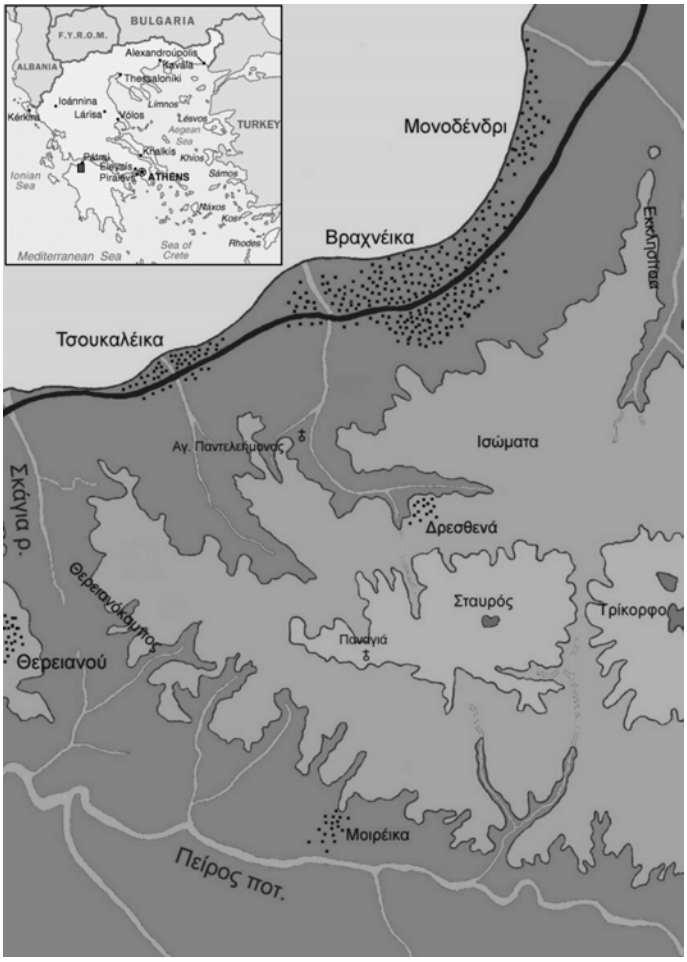

Figure 1: The territory of Vrachneika.

3. The Vrachneika case-study

The area under study is a hilly terrain with a complex geomorphology, divided by small ravines into separate geographical units, a factor that complicated our study (figure 1). It soon became obvious that a surface survey was required, due to the lack of information on the history and archaeology of the majority of the area. On the other hand, smaller areas near the coastline and in a ravine had already been surveyed by archaeologists of the local branches of the Archaeological Service and members of the project for the historical topography of western Achaia (Petropoulos and Rizakis 1994). These areas are well documented in the archaeological and historical bibliography as places evidencing important settlement activity during the Late Bronze Age (Papadopoulos 1979:26, Petropoulos and Rizakis 1994:190, table 1, site no. 21) and the Roman period (Petropoulos and Rizakis 1994:190, table 1, site no. 22). Consequently, there were two stages of research: selecting all published evidence of human habitation during prehistoric, historic, medieval and post medieval times in the area, then surveying the terrain by fieldwalking in order to evaluate the published information, in the light of new evidence and finds. In the first stage, we used the testimonies of ancient and modern travellers and some published excavation reports from the last 50 years. In the second stage of research, a wider range of information was collected, including topographical maps, place-names, environmental and geomorphologic evidence, survey drafts, survey fieldnotes and photographs. As a result, a large amount of information was gathered and we had to utilize it in the best way in order to formulate the final interpretations and conclusions of our work. This was achieved by creating a relational database application, using Access 97 software (Tsakirakis 1997-98).

4. Database application

4.1. General description

The database of the Vrachneika project, soon to reach its final form, is the first computer application in the Achaia province for the documentation of the local cultural heritage. It consists of 20 tables with a total of 87 fields of data and more than 50 select and crosstab queries in Structured Query Language - SQL. Most of the queries are embedded in forms and reports. Data can be recorded, viewed and edited via the input and output forms and subforms, which also contribute to a better user interface. Macros and Visual Basic for Applications – VBA routines and procedures manage automation of the application. Tables are bound to each other with “one-to-one”, “one-to-many” and “many-to-many” relationships. The overall size of the application was about 5 MB with no data and 60 MB when all information of the project was stored in the database. Eighty-seven historical sites were recorded.

4.2. Table structure and methodology

The overall structure of the Vrachneika database was determined by the research methodology of our workgroup. Initially, it was necessary to decide on the categories of information that should be recorded and processed. Our methodology necessitated a primary data table, where the basic characteristics of each site would be recorded. To create the primary table of sites we took into account a definition of the term “site” as an area of concentrated human intervention in the past, in relation to the historical evidence and finds of its proximate surrounding geographical space. This helped us define the “site” as the basic record unit of our application. Modern topographical parameters and a description of the natural landscape of each site were important, as well as information about landowners and the place-names. All these fields of data, along with a field for the general description of the site, were included during the layout process in the primary table (table 1).

The table of sites, associated with the other tables, plays a pivotal role in the application. For each recorded historical site of the primary table, a number of fields provide additional information in supplementary tables about topographical site maps, site finds, surface survey ceramics and bibliographical quotations. These tables are bound to the primary site table with “one-to-many” relationships. Some of their fields support Object Linking and Embedding - OLE, in order to accept picture entries: this is the case in the fields of site topographical maps, survey ceramics and finds tables.

As mentioned before, archaeologists of the Archaeological Service had previously investigated some sites. This provided us with a bibliography of published finds, such as pots and necklace beads from two Late Bronze Age cemeteries of rock-cut chamber tombs (Papadopoulos 1979:66 and 141, Papapostolou 1977:485-490). According to the archival classification system of the local branches of the Archaeological Service, these finds are indexed as “movable” finds, in contrast to the category of architectural finds, like ancient tombs or building walls. This classification, which serves an administrative purpose, was at first adopted for

FIELD NAME	DATA TYPE	FIELD SIZE	VALIDATION RULE	DISPLAY CONTROL	ROW SOURCE (SQL)	KEY	INDEX
SiteID	AutoNumber	Long Integer	-	-	-	Primary	Yes (no dublicates)
SiteName	Text	255 bites string	No zero length	Text Box	-	-	Yes (no dublicates)
Village	Text	100 bites	Is Not Null	Text Box	-	-	No
Settlement	Text	100 bites	No zero length string	Text Box	-	-	No
Toponym	Text	255 bites	No zero length string	Text Box	-	-	No
Description_ of_Location	Memo	-	No zero length string	Text Box	-	-	No
Category_of_Size	Number	Integer	-	Combo Box (2 Columns, 1st Bound, 2nd Visible)	SELECT SizeCategories_ of_Sites.* FROM SizeCategories_ of_Sites ORDER BY SizeCategories_ of_Sites.Size;	-	Yes (dublicates OK)
Natural_Landscape	Memo	-	No zero length string		Text Box	-	- No
Landowner	Memo	-	No zero length string		Text Box	-	- No
General_Site_Description	Memo	-	No zero length string		Text Box	-	- No

Table 1: Sites Table Layout.

the database classification of site finds. During the first layout procedure of the database, all finds were indexed as "architectural" or "movable" in two different tables, in order to make our application compatible with possible future databases of the local branches of the Archaeological Service. But later on, when it was realized that such a prospect was not immediately forthcoming, we decided to merge all the finds in one table, to avoid duplicate table fields and refine our database.

Except for the aforementioned primary and supplementary tables of the application, other tables with a few data fields, conventionally named "list tables", were created for feeding in the selection lists and combo boxes of the forms with information. This is the case with the tables for researcher names, site categories of human use, categories of size, historical periods of human use, titles of the relevant bibliography, typologies of finds and surface survey ceramics. The researcher names were required for the documentation of site surveys. The site category of human use is a term for specifying what function a site had during its historical lifetime, for example, if it was a settlement, a farmstead or a cemetery. We had to take into account the fact that many sites had different uses in different historical periods, especially in the case of the multi-period sites. Size category is a subjective criterion for assorting sites according to their size on the surface and was measured in square meters. We assigned three basic size categories. The purpose of this classification was to compare the site categories of human use with the average size of sites and conduct explanation models for contemporary sites that could not be ascribed a clear use, due to lack of sufficient archaeological evidence. As for the historical periods of human use, each site could be represented by more than one record. This proved to be very convenient in the case of multi-period sites, where human activity occurred at the same place during different periods of time.

4.3. User interface

Having arranged all issues concerning table structure and the overall layout of the application, we proceeded to design the user interface. A switchboard form with navigation buttons was created to provide access to the recorded information in the database (Tsakirakis 1997-98: figure 1). From here the user can load the sites primary form (figure 2).

This form retrieves all data related to each site from the primary sites table (table 1). Through the sites form, the user can view or edit each site's maps (figure 3), finds, fieldnotes and bibliographical citations, stored in the supplementary tables. These categories of information are accessible via graphic buttons that open other forms, by using VBA routines and macros. Access to the same information is also available through the switchboard form of the application. All forms have combo boxes, which retrieve their data from the "list tables" of categories, typologies, historical periods and bibliographical titles. The records of the combo boxes can be selected by scrolling lists. At any time and by request of the user, these lists are automatically updated with more records, as VBA procedures add new entries in their source tables. These procedures are activated after specific events, for example the user double clicks on a combo box field to enter a new record on its list.

From the main switchboard form, the user can proceed to search for information about a site by using the overview form (Tsakirakis 1997-98: figure 7). In this case, all recorded data of a site is retrieved from the related tables and presented synoptically. These data can also be viewed and printed in report format.

Another function of the application is to search the sites categories of information for common records, for example, by filtering all site entries via output forms, to locate the records of a specific find or ceramic category and select all sites dated in a specific historical period. The output data of these forms can be viewed and printed in report format, or exported to another application.

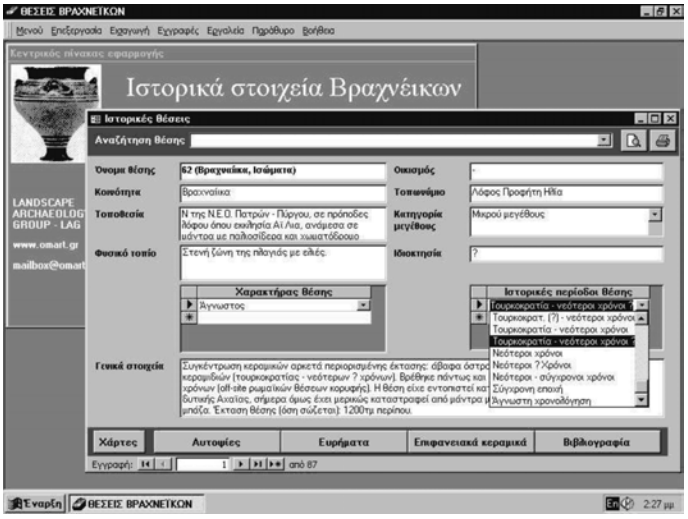

Figure 2: The sites primary form.

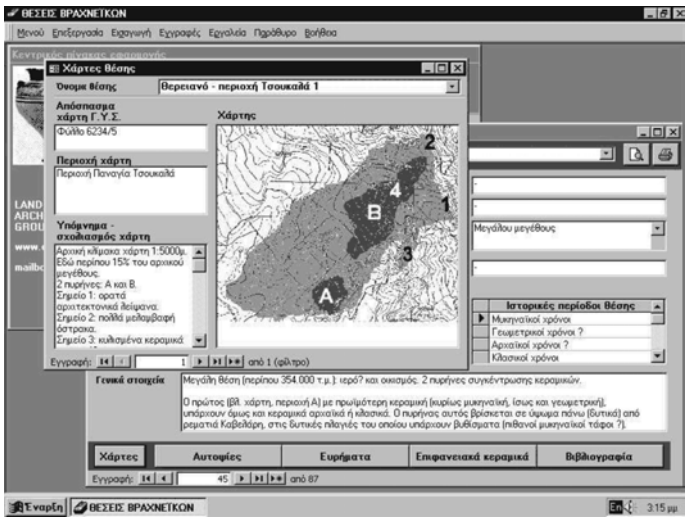

Figure 3: The sites map form.

Besides the retrieval of data, some graphs of quantitative ratios of the site data categories are available via the switchboard form of the application. The user can view graphs displaying the ratio of the total number of sites during historical periods (figure 4), the frequency of the site categories of size and the categories of human use. These graphs, though of no special statistical interest, helped the workgroup to arrive at useful conclusions regarding the history of settlement and the kinds of human intervention during historical periods. Graphs can also be viewed and printed in report format.

Finally, an important feature of the application is the automatic generation of reports of the recorded information. By using macros and VBA procedures, a report of a selected site can be viewed, printed or sent to another application for advanced processing (Tsakirakis 1997-98: figure 6).

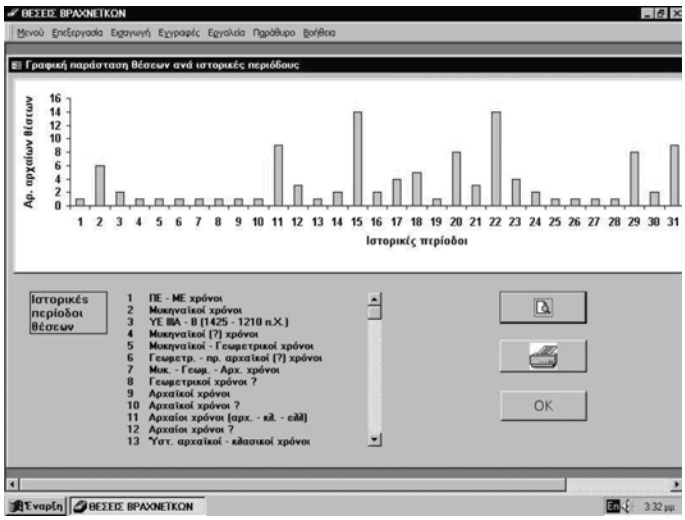

Figure 4: Graph form displaying the ratio of the number of sites during historical periods.

5. Conclusions

I would like to mention again that our application is the first non-administrative database in Achaia for the recording of historical sites throughout the landscape. Our attempt is basically experimental and by no means a finished endeavour. Presumably some things may need to be changed and improved in order to satisfy the demands of our research. In the future our work in western Achaia will continue and we intend to create a similar database application for every community we study. In the long-term, we plan to link all these databases within a central relational database management system. Thus, all the historical information will be accessible to any individual, from any of the local communities, interested in studying the cultural heritage of this area.

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References

ANDRINOPOULOS, A., 1998. Ancient and Contemporary Land Use in West Achaia, Peloponnesus, Greece: A GIS Application. In Peterson, J. (ed.), *Cost Action G2; Paysages antiques et structures rurales; The use of Geographic Information Systems in the study of ancient landscapes and features related to ancient land use*: 37–42. Norwich, UK: School of Information Systems, University of East Anglia.

ANDRINOPOULOS, A. and SIMONI, H., in press. G.I.S. application on the archaeological survey of western Achaia. In Rizakis, A. (ed.), *Proceedings of the A' International Conference on Ancient Dyme, Dymaia – Vouprassia*, Kato Achaia, 6-8 October 1995.

ARGYROPOULOS, B., PAPAGIANNOPOULOS, K. and CHRONOPOULOS, B., 1998. *Kareika of Achaia: community and identity*. Patras: study submitted to the Community Council of Kareika.

PAPADOPOULOS, A., 1979. *Mycenaean Achaea*. Studies in Mediterranean Archaeology LV:1. Göteborg: P. Åströms Förlag.

PAPAGIANNOPOULOS, K. and CHRONOPOULOS V., 1998. *Agiovlassitika; steps through time*. Patras: Community of Agiovlassitika.

PAPAGIANNOPOULOS, K. and ZAHOS, G., 1994. Intensive Survey. In Petropoulos, M. and Rizakis, A., Settlement Patterns and Landscape in the Coastal Area of Patras, Pre-

liminary Report. *Journal of Roman Archaeology* 7:187 – 189.

PAPAPOSTOLOU, I., 1977. *Collection of antiquities from Achaia*, Praktika tis en Athinaes Archaeologikis Etaireias 1977 B:485 – 490.

PETROPOULOS, M. and RIZAKIS A., 1994. Settlement Patterns and Landscape in the Coastal Area of Patras, Preliminary Report. *Journal of Roman Archaeology* 7:183 – 207.

SIMONI, H. and PAPAGIANNOPOULOS, K., 1998. Project for the Topography of Ancient Achaia, Greece: Quantitative Analysis and Visualisation of the Results of the Intensive Surface Survey at Kamenitsa. In Peterson J. (ed.), *Cost Action G2; Paysages antiques et structures rurales; The use of Geographic Information Systems in the study of ancient landscapes and features related to ancient land use*: 43–56. Norwich, UK: School of Information Systems, University of East Anglia.

TSAKIRAKIS, V., 1996. Statistical notes on archaic, classical and early hellenistic pottery from the intensive survey at Western Achaia. *Pyxida* 2:37 – 43. Patras: Landscape Archaeology Group.

TSAKIRAKIS, V., 1997-98. Database application for historical–archaeological research: recording of historical sites. Preliminary report. *Pyxida* 3: Web edition at www.omart.gr/pyx3gr.html#Pyxida3_MeletiBT. Landscape Archaeology Group.

ZAHOS, G., PAPAGIANNOPOULOS, K., SIMONI, H. and THANASSOURAS, N., 1995. Experimental application of intensive survey of Therianou area, Achaia. *Pyxida* 1: 24 – 34. Athens: Landscape Archaeology Group.

ZAHOS, G. and PAPAGIANNOPOULOS, K., in press. *The intensive surface survey in Achaia; a different approach*. In Rizakis A. (ed.), Proceedings of the A' International Conference on Ancient Dyme, Dymaia – Vouprassia, Kato Achaia, 6-8 October 1995.

Notes

[1] Cf. at the LAG's website, http://www.omart.gr/.