Effective - Easy to Use - Economical: PGIS, the Database for Archaeological Monuments in Speyer (Palatinate), Germany [1]

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Abstract

The monumental heritage department in Speyer/Palatinate has developed a GIS-supported inventarisation for archaeological monuments which guarantees the user an easy handling and a very effective procedure not only thought for the needs of the monumental heritage but as well for scientific research. Besides this data bank offers minimal costs concerning purchase and support. The following article gives a short insight into the possibilities of the system.

Introduction

In the last decade, the use of GIS-supported applications has multiplied in the archaeological world and is beginning to become a standard-tool for the monumental heritage of Germany as well (see e.g. Zeeb 1999, Wilbertz 2002, Schwarz 2002, Hess 2003). Whereas some of the bigger state-departments for monumental heritage in Germany were able to provide the necessary funds for the development and later support of GIS-based data banks, the smaller and financially less amply furnished departments are still forced to manage with analogue data and maps.

Out of the need to accelerate statements on building plans and the like and for more effective procedures in the daily work, the department for archaeological monuments in Speyer took advantage of the fact that a PhD-student working on his thesis in Speyer offered his skill in programming data banks. The authors experience in working with an archaeological GIS gained during her years of work at the monumental heritage department of Saxony offered additional help in creating a GIS-supported data bank for the archaeological monuments of the Palatinate (southern part of Rhineland-Palatinate). The goal was to achieve a system which would be modest in costs, easy to handle but nevertheless effectively working for the necessities of the monumental heritage administration.

The need for more effective tools becomes more and more demanding in the preservation of archaeological monuments. The amount of all kinds of building projects is steadily rising. Each one concerned with any changes in the ground requires a statement from the archaeological side. The way these statements are traditionally achieved shows that the time required and the output of the analogous work is not up to date any more.

For working on a plan for land utilization for instance it was necessary to examine all the registered sites in the communities concerned. Every known archaeological site had to be looked up in the analogous record, maps had to be looked at and the parish-files with detailed descriptions and extended pieces of information had to be read.

The result of this extended research was a copy of the original plan into which were entered by hand the sites concerned. A list of the sites, their significance and potential endangering had to be written down separately. This proceeding is neither effective nor in keeping with the times. It does not add to the reputation of the archaeological departments as equal partners for investors and building administrations in the communities.

A second important fact is the endangering of the analogous data - parish-records are often not kept fire-proof; one major fire and the archaeological record as a whole would be lost without any chance of recovery.

The summary beneath lists a number of advantages that make a GIS-supported data bank an outstanding preference to the conventional course of the administration of archaeological sites:

- lists of selected sites can be created instantly
- specific formulations of a question can be followed up easily
- if details to a site are needed they can be provided with a single mouse-click
- detailed or generalized maps can be drawn up
- parish-records are available in standardized digital form
- safeguarding of analogue data is guaranteed

A second main subject on the agenda of the departments for monumental heritage must be mentioned in connection with PGIS: archaeological research. Specific scientific questions can be answered more easily with the help of a GIS. Quantitative and qualitative analyses are performed within the frame of a data bank. Culture-historical maps quickly answer questions concerning settlement history or changes of settlement patterns.

Technical Details and Possibilities

The data-bank U. Himmelmann, responsible for programming PGIS, created, is a product fulfilling a multitude of tasks.[2] It is usable without lengthy introduction, it is compatible with all Microsoft products and must not be supported by a specific firm as access-programmers are widely available.

Extended discussions about structure, contents and meaning of the sources led to a concentration on the archaeological site which is the focus of the archaeological work in monumental heritage administration. A multitude of primary relations and connections with other data were defined (Fig.1). The arrows with broken lines indicate that many secondary

relations had to be defined as well before definitely working out the structure of the data bank.

PGIS consists of three central parts: PGIS (the data bank), the GIS-Software/Digital map and the parish-records (in different formats under HTML-surface). In a second step the integration of the items shown on Figure 2 is planned; then the entire record of an archaeological site will be provided by PGIS.

PGIS can be used on a single station as well as on an internal network or via internet. The programme was realized on the basis of MS access with extended SQL-orders; the next stage will be programmed in Visual Basic. A small programme allows the transfer of the data bank including all of its functions to an unlimited number of other computers. No MS access-licence is needed, PGIS works with an integrated run-time-version free of charge.
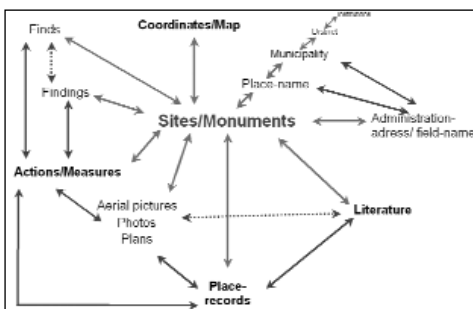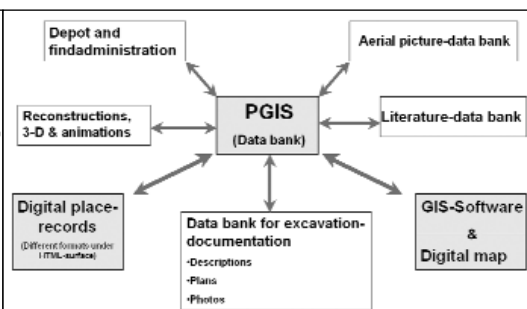
ders containing a lot of details including old maps, drawings and site-descriptions. These are formatted as html-pages, thus needing only a small amount of memory capacity so that even lengthy documents can be integrated.

The tools for input, corrections and additions to the information-pool of each site form an important part of the system. Data can easily be changed, new information can be added as well as new objects. An unlimited amount of data can be filled into the data-line of a single site which is important as a lot of different archaeological objects are possible on one site.

Thesauri for the fields "archaeological object" (e.g. "settlement site", "burial mound") as well as for chronology and archaeological culture (e.g. "Neolithic", "bell-beaker culture") guarantee the avoidance of writing errors. The information in the thesauri is structured hierarchically so that general assignments like "graveyard" are as well possible as exact descriptions like "barrow with skeleton-burials". Each thesaurus can be changed and new terms can be added.

Figure 1 Relations and connections of the archaeological record

Figure 2 PGIS. Relations in the databank

As explained further below ("Visualisation"), our access-based data bank is attached to the GIS-programme "Hill-GIS", but a combination with standard-GIS-programmes like ArcView or MapInfo could as well be realized without any problems at all.

OUTLINE AND FUNCTIONS

One of the main functions is the enquiry-tool (Fig.3). The parishes containing archaeological sites are arranged alphabetically. Specific place names can be filtered as well as single site-numbers, all sites of a bigger administration unit or all sites of a specific period like Roman for instance. Besides it is possible to run several requests at the same time. Detailed information about the archaeological background of a certain site is provided like the grid reference, field name of the location or details concerning the finds from a site and their chronological classification. It is also possible to get access to the original parish-fol-

Every action like "excavation 1987" or "aerial photo 1992" on a site is recorded, new actions can be added in unlimited number. For each kind of action a thesaurus is used also. A short inventory of finds which are assigned to each single action is provided. This inventory is only thought as a general overview - for detailed information entering the finds data bank is asked; this data bank will be integrated in PGIS in 2004.

Naturally, as PGIS is a data bank with GIS-application, a map for every research can be seen and printed out. When making an enquiry, it is important not only to create a map but also to receive a list of the monuments selected. PGIS offers the choice between a short list providing just basic information and an extended inventory containing more details for each site.
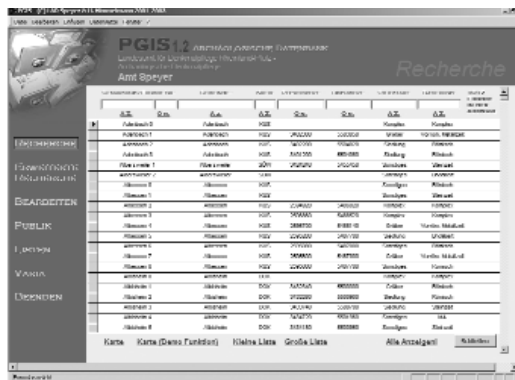

Figure 3 PGIS. Main window for enquiry

Figure 4 PGIS. Integrated ortophoto of the restaurated Roman villa from Ungstein (Palatinate)

Figure 5 PGIS. Flyer-text for the restaurated Roman villa from Ungstein (Palatinate)

These lists can be printed directly out of the programme or be transferred into any MS office-format like Word documents ore Excel data banks for further use.

VISUALISATION

The location of the chosen sites on digital maps is realized by a cooperation with the Department for Land Survey and Geological Basis Information of Rhineland-Palatinate. By providing the afforded maps and a programme (Hill-GIS) for integrating our site-symbols the department is in return offered information on unendangered, visible monuments for integration into various maps produced by this department.

Concerning the maps there is a choice between a scale of 1:200,000, 1: 25,000 and various zoom-scales below the latter. Also provided by the Land Survey Office are orthophotos covering the whole of the Palatinate. These are very helpful especially for the location of visible sites like burial mounds or restaurated roman villas (Fig.4).

Short texts for public relations work concerning selected monuments, added by pictures, opening times and journey descriptions are an additional possibility when using PGIS (Fig.5). All such pages can be transformed easily into html-documents for further use in the internet, for the creation of flyers or other items.

ENDNOTE

PGIS, as described above, is a financially attractive, easy-to-use and effective alternative for the procedures of daily work in state-departments for monumental heritage as well as in archaeological science-work. Such tools, mostly still very cost-intensive at the time, become more and more demanding in the process of preserving archaeological monuments as well as facilitating scientific research.

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