The New Norwegian Rock Art Database

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ABSTRACT

The Rock Art Project was set up by the Directorate for Cultural Heritage on behalf of the Norwegian Ministry of the Environment in 1996. The database was initiated within the EU-supported INTERREG IIA, a joint Norwegian-Swedish project called Rock Art in the Borderlands 1998-99. The Norwegian Rock Art Database combines photographs, drawings and digital maps to provide a useful multimedia source. Any feature described in the text part of the database can be linked to one or more photographs. The photos can also be linked to an overview of the selected site, which is represented either by a tracing or by another form of small-scale map. An important function of the database is to store the complete documented history of each site. By selecting a specific site from the database, the user is presented with a list of all previous scientific evaluations and records for that particular example, including dates of earlier field studies, the names of the project leaders, and types of documents available. The application is designed for the data input and interrogation using an Oracle database. The software used to develop the application is Visual Basic and Map Objects. The application executes 100 percent on a Citrix application server and only mouse clicks and screen updates are transmitted over the network between server and client. This allows the use of inexpensive computers and enables high application performance even over limited bandwidth connections. The regional institutions and the regional museums are responsible for updating the database.

KEYWORDS: Rock art, database, Citrix client-server

INTRODUCTION

The Rock Art Project [1] was set up by the Directorate for Cultural Heritage (Riksantikvaren) [2] on behalf of the Norwegian Ministry of the Environment in 1996. Alarming reports had already been coming in for several years before that date. The rock art is in generally poor condition, due to weathering, vandalism and other human impact. Around 95% of Norway's rock art is damaged in some way, and the speed of deterioration is steadily accelerating. Around 1100 sites representing more than 2000 individual examples have been documented to date, the majority of which are rock carvings. The rock art mostly dates to the Mesolithic, Neolithic and Bronze Age periods, but also extends a few hundred years into the early Iron Age. A current priority is to create standardized methods of recording and maintaining 300 targeted sites. In order to do this, the Norwegian

Institute for Cultural Heritage Research (NIKU) [3] has developed a rock art database to manage the protected sites. The database was initiated within the EU-supported INTERREG IIA, a joint Norwegian-Swedish project called Rock Art in the Borderlands 1998-99. The database is available on the Internet [4] for the purposes of research and local and national government administration.

THE NORWEGIAN ROCK ART DATABASE

The Norwegian Rock Art Database combines photographs, drawings and digital maps to provide a useful multimedia source. Any feature described in the text part of the database can be linked to one or more photographs. The photos can also be linked to an overview of the selected site, which is represented either by a tracing or by another form of small-scale map (figure 1).
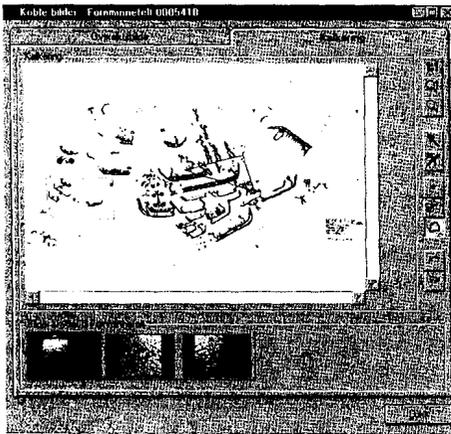

Figure 1: Tracing and photos.

The database also includes an integrated GIS-function, allowing any selection of sites from the database to be given their own signatures and to be presented on a digital map.

Most data fields are supplied with a dropdown list with options giving the legal terms or values for that field, thus ensuring content consistency.

Information relating to the landowners on whose property rock art sites are found can be automatically retrieved from the national property register via the database.

An important function of the Norwegian Rock Art Database is to store the complete documented history of each site. By selecting a specific site from the database, the user is presented with a list of all previous scientific evaluations and records for that particular example, including dates of earlier field studies, the names of the project leaders, and types of documents available.

## TECHNICAL SOLUTION: THE ROCK ART DATABASE

The application is designed for the data input and interrogation using an Oracle database. The software used to develop the application is Visual Basic and Map Objects.

We are using a "one server" solution, placing both the database server (Oracle) and the application server software (Citrix) on the same physical machine.

Additional software includes: Windows NT Terminal Server 4.0, Citrix Metaframe Application Server v. 1.8, ODBC Merant Client Access, MapObjects and Oracle 8i standard edition.

The software and application is run on a 800 MHZ, Pentium III server with dual processors, 1 GB RAM and 2 * 9 GB (os mirrored) and 3 * 9 GB (striped) RAID discs. The quality and size of the

server is critical for this kind of solution
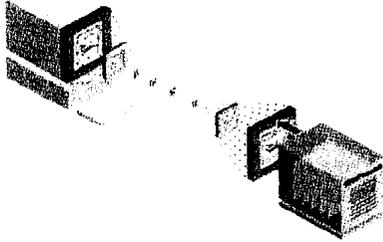
Figure 2: Thin clients

The application executes 100 percent on the server and only mouse clicks and screen updates are transmitted over the network between server and client. This allows the use of inexpensive computers, which act as "thin clients" (figure 2). The only software needed on the user's side, is a very small Citrix file for win95/nt/2000 (ica32.exe), which is downloaded from our website. The technique enables high application performance even over limited bandwidth connections such is ISDN (64 K) and modems (28.800 baud).

USERS AND DISTRIBUTION

The most important users are the regional government administrations and regional museums, about 30 institutions in all. The Rock Art Database is intended for use in regional and local planning, as well as in the management of cultural heritage at all levels. It is also designed as a tool for research.

The regional government administrations and the regional museums are responsible for updating the Rock Art Database. The database and the application are located on a central server at the National Institute for Cultural Heritage (NIKU), and are distributed to the users by means of a thin client (Citrix Metaframe). This includes all data-types: text, maps, drawings and photos. The regional institutions, which are responsible for updating the database, are given read-write access regulated by security passwords.

NIKU offers introductory courses for all new users. To date four such courses have been held and the plan is to run several more each year throughout the country. We believe these courses are necessary to ensure that a high standard of data is maintained in the database. In addition to this there are established protocols to verify the data. This means that NIKU monitors database updates. During this process the data is "locked" so that no changes can be made by the users without special permission.

User support is critical for all distributed data-systems. It is important that new users in particular can get rapid solutions to any problems. NIKU offers user support by e-mail and telephone. There is a website with information about user support (figure 3).
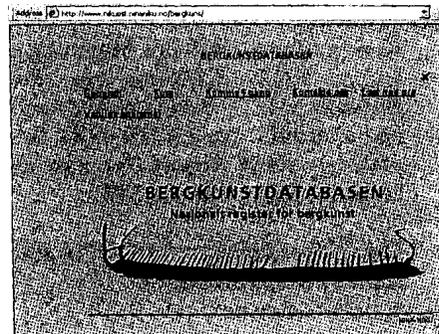
Figure 3: Website for support

We have also planned to expand this site with an additional section covering items such as: "frequently asked questions", information on changes in

the applications, and any new procedures.

CONCLUSION
The first version of the Rock Art Database is now available. The aim of the database is to centralize all relevant governmental information about rock art. This includes data from archaeologists, geologists, botanists and curators, and other relevant disciplines. This provides a cross-discipline information resource, which we hope will help to reduce the further deterioration of Norwegian rock art.

The use of "thin client" technology has made it possible to access the Rock Art Database through analogous telephone lines and mobiles. This enables the use of the database during fieldwork.

There will, of course, be a constant need for improvement and adaptation as user-demand dictates. New suggestions will be recorded and acted upon to ensure that updated versions of the Rock Art Database are continuously developed.

REFERENCES
1. Karl Kallhovd and Jan Magnusson (Ed.): Rock Carvings in the Borderlands. Bohuslän/Dalsland and Østfold - An INTERREG IIA project - Final Report Rapport nr: 2000:56. ISSN 1403 - 168X.

2. The Directorate for Cultural Heritage,Riksantikvaren.
   http://www.ra.no

3. Norwegian Institute for Cultural Heritage Research, NIKU. Foundation for Nature Research and Cultural Heritage Research, NINA - NIKU. English website: http://ninaniku.no/Estart.htm. Norwegian website http://www.ninaniku.no/

4. http://www.bergkonst.org

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