

# SMR in New Clothes: The Danish National Record of Sites and Monuments on the Verge of a New Era

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## *Abstract*

*The Danish National Archaeological Record of Sites and Monuments (DKC) is at the moment in a transitional phase - in two respects:*

*One is that DKC, as an institution, is changing from its traditional SMR function of registering information to providing a wider service for use of cultural historical information technology.*

*The other is that the DKC-database is progressing from a traditional SMR-base to become a Cultural-Historical Atlas of Denmark – a portal to digital knowledge about the cultural history from past to present.*

*This paper provides a brief presentation of these two developments.*

*Key words: SMR, database, cultural-historical atlas, GIS, internet mapping, digital excavation plans, multidisciplinary projects, multimedia*

## **1. DKC in a transitional phase**

The Danish National Record of Cultural History (in short: DKC) is a national database of archaeological sites and monuments. The register, which is housed at the National Museum, was founded in 1984.

The original basis for the Central Register is the so-called "Parish Record" which comprises comprehensive text and map data concerning archaeological monuments and finds.

During the years from 1873 to 1937 archaeologists from the National Museum's staff visited the whole of Denmark. The result was a systematic nationwide record of Danish ancient monuments and locations for many of the objects in the present National Museum's collections. In 1982 DKC started the digitisation of the "Parish Record", a task which has not yet been completed. The database can be accessed from the Internet with full access only for professional users.

During the last decade a number of new developments have occurred at DKC. One of the reasons for this is, of course, the rapid development in computer technologies, a development that is enabling the implementation of many ideas that before were not truly viable.

DKC is at the moment in a transitional phase - in two respects:

- DKC, as an institution, is changing from its traditional SMR function of registering information to providing a wider service for use of cultural historical information technology.

- The other is that the DKC-database is progressing from a traditional SMR-base to become a Cultural-Historical Atlas of Denmark – a portal to digital knowledge about the cultural history from past to present.

This paper will provide a brief presentation of these two developments.

## **2. Status: The DKC today**

The main task for DKC is maintaining the national database of archaeological sites. As of now the database contains more than 140.000 sites at three different levels of registration (figure 1). It is clear from this illustration that care is necessary when making distribution maps at a national scale.

3150 new site reports were received from the Danish museums during the year 1999 – a fairly typical annual average.

The current procedure for a new site report is shown in figure 2: Information from a new archaeological location is brought to the museum where a new site report form is sent through the mail system to DKC. The information is then typed into the database.

### **2.1. DKC online**

DKC online is a presentation of the data in the DKC database on the net – it is the DKC front to the public (<http://www.dkc.natmus.dk>). There are several entry points to the online database.

First the user is shown a map of Denmark with a geographical search procedure. By clicking on an area, a new menu appears with a choice of various maps at different scales. The public can

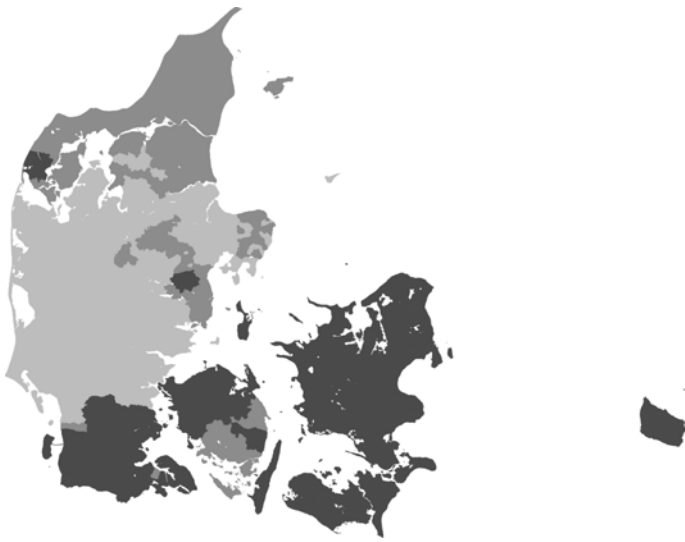


Figure 1: Registration status by parish. Dark parishes are fully registered, meaning updated with all information from the original "Parish Record", supplied with information from other National Museums archives. A check of the geographical position has also been made. The medium gray marks are partly registered parishes, which contain information from the original Parish Record and a site classification (dating and category) based on "Parish Record" information only. Light gray denotes parishes, where the location of the sites is registered, but only a provisional classification has been made.

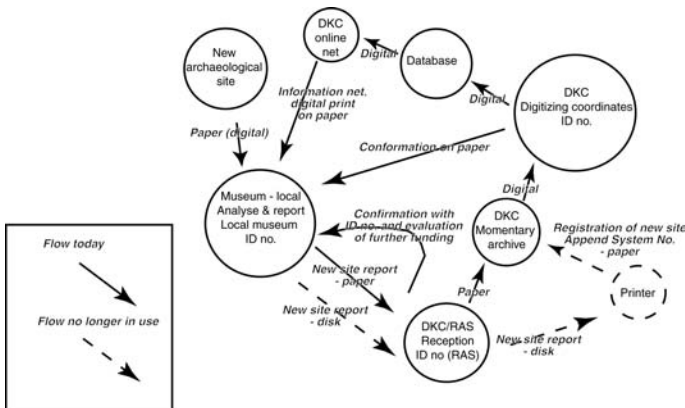


Figure 2: The current procedure for the processing of new site reports.

view the distribution on maps in 1:200,000, but to access 1:100,000, 1:50,000 or 1:25,000 scales (figure 3) a password is needed, thereby limiting the possibility for the public finding the exact location of a find. The user can click on a dot representing a find and further restricted information can be obtained.

The other approach is topographic (figure 4). Here the user is supposed to have more information about the database. Information on a find in the form of an illustration can be presented, for instance the burial shown in figure 5.

### 3. Non-registration tasks

As mentioned in the introduction, the main role of DKC is the electronic registration of various cultural historical data. This, of course, is still the DKC's function, but there are increasing expectations in the museum community that DKC will function as a

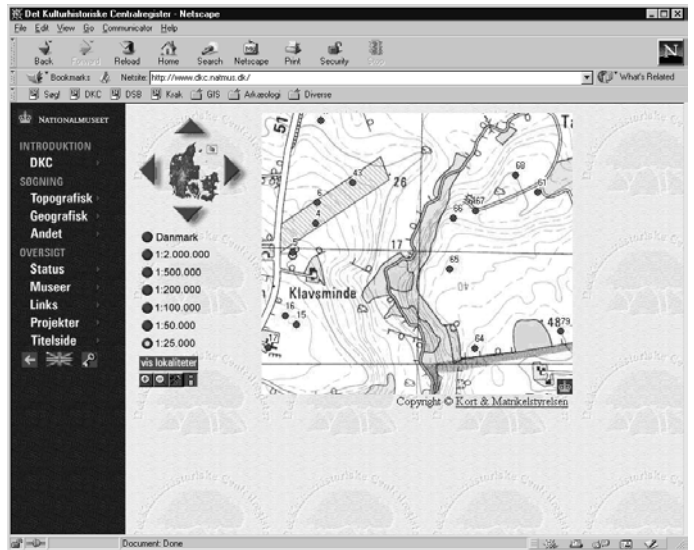


Figure 3: DKC online: Geographic search.

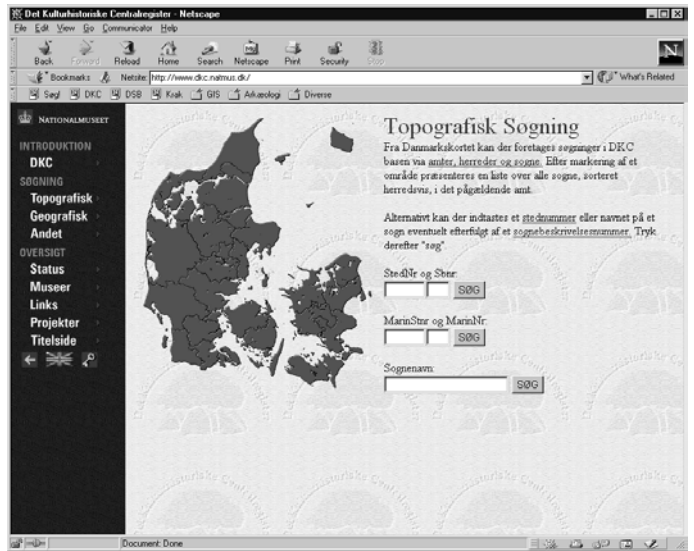


Figure 4: DKC online: Topographic search.

centre for cultural historical IT knowledge capable of any task involving IT and cultural historical data.

Examples of these tasks are the production of distribution maps and other types of illustration for publication, digitising map data, GIS analyses, programming tasks etc.

We can do all of this, of course, but with limited staff and no signs of extra funds in the near future, it is a difficult situation. So there is no alternative other than to charge for these extra services, but even in this situation it can be difficult sometimes to find someone with time to do a job.

### 4. Introducing GIS

One of the recent initiatives by DKC has been to arrange introductory courses in MapInfo GIS for representatives from the museums. A number of these sessions have already taken place, and more are still needed. In fact we were somewhat surprised to see the introductory courses become such a success. It is inspiring to see the willingness among the museums to accept new technologies – and to realise the potential in these technologies. So far



Figure 5: "A barrow from ancient times at Raklev on Refsnaes" by Thomas Lundbye (1839). Thorvaldsens Museum.

about 75 percent of the archaeological museums in Denmark have purchased a MapInfo license.

A substantial number of man-hours have been invested in the running of the introductory courses. But as a long-term investment there is no doubt it pays off for the archaeological community as a major leap forward in persuading the museums to "go digital".

Courses for experienced users will take place at a later date.

Why MapInfo? In our opinion it is the best GIS in terms of being easy to learn, easy to use –the fact that we struck a very fair deal with the Danish MapInfo distributor KampSax also helped.

This program of courses in MapInfo GIS is the direct result of a wish to expand the subjects recorded within DKC to include digital excavation plans. By using GIS the documentation and data will be more easily accessible in the future. In an online perspective, it offers interesting possibilities.

Imagine clicking your way through map levels, starting at the national level with your site represented as a dot, zooming through regional levels where the site perimeter is represented as a polygon and ending up at a local level with the plan of your Iron Age village shown against the background of a contemporary landscape as shown in a high resolution digital orthophotograph.

## 5. A National Record of Social History

So far DKC has mainly recorded archaeological information, but we are now facing the challenge of dealing with modern ethnological information. The background for this is the fact that we have more than 100 local, but professionally managed, museums in Denmark. The majority of these museums are working in the field of ethnology and social history, and they are concerned with the period after 1660. Most of them have their own electronic records of things, archives, photos etc. in their possession. By and large they have conceded to a common structure of recording this information, more than half of the museums using the same software program specially developed by an institution under the Danish Ministry of Cultural Affairs.

In the wake of general IT development the idea is to try to gather all these local databases, merge them into one central, national record of social history and present this comprehensive record on

the Internet. The idea has materialized in so far as we are now running a pilot project in small scale. We hope to be able to present a preliminary result of a Cultural-Historical Information System on the Internet by the end of this year.

The illustration in figure 5 represents the various approaches one can adopt when approaching cultural history. The archaeologist will define the monument as a burial with a dating etc., while the ethnologist sees a national romantic representation. Both have to be incorporated in the structure of DKC and perhaps within a common database. The aim for the DKC at present is to deal with these widely variable perceptions.

## 6. DKC as a provider of digital maps

Another of the more recent functions of DKC is to provide digital map material to the Danish museums. Through some very favourable deals with The National Survey and Cadastre and Kampsax, the two largest geo-data agencies in Denmark, it is now possible to offer the Danish museums a wide range of historical and modern digital map material as well as digital orthophotos at a reasonable price.

These data are also available to the museums in paper-form as map sheets with archaeological locations plotted in.

## 7. Project involvement

At the moment DKC is involved in two large multidisciplinary projects: "Changing Landscapes" and "Agrar 2000". The two projects have a number of similarities, focusing as they do on the cultural landscape and with a strong emphasis on strategic aspects, one of the aims being to develop methods and tools of use in the management of the landscape. Both use MapInfo GIS.

### 7.1. Changing Landscapes

The DKC subproject in Changing Landscapes (<http://www.ou.dk/Hum/ForandLand/English/Index.htm>) deals with the development of a Cultural Landscape information System - or CLIS in short.

The aims of the CLIS-project are:

- To develop an information system containing digital information about the cultural landscape in the past as well as in the present - information being presented in the form of geo-data and metadata about the geo-data.
- To generate data for the information system through digitisation of a series of analogue maps from the oldest topologically accurate maps of 200 years ago through to the maps of today.
- To give access to existing DKC-data in a way that is easier to interpret, i.e. where data points have been transformed into areas.
- To produce thematic layers with a predictive content.
- To make information available to landscape managers and researchers on the internet and as thematic layers for use within a GIS context.

There is a real need for an Information System containing factual as well as hypothetical information about the location of sites in the landscape. It is not only a question of which archaeological

sites exist in a given area, but also their presumed extent and what type of site is likely to be found in that area.

DKC is frequently consulted at the planning stage of major public projects, including the construction of new railway lines or highways, with questions about the number and location of sites within or near the project area.

One of the more important issues is to develop methods to transform the point data to surfaces via analysis of landscape characteristics, thus providing a more adequate representation of a pre-historic reality.

The use of historical as well as modern map material makes it possible to study the changes in land use over time and compare this information with the archaeological record in order to assess the significance of archaeological sites.

## 7.2. Agrar2000

The other multidisciplinary project involving DKC is Agrar2000 ([www.natmus.dk/Agrar2000](http://www.natmus.dk/Agrar2000)). The title of the DKC-subproject is “*The agrarian Landscape: Land-use and regional variation during the Roman Iron Age, Early and High Middle Ages*”. The aim of the project is to develop methods to refine the information in the DKC database in order to enable a qualitative improvement of these data and increase data homogeneity, so that the database can more confidently be used in analyses aimed at elucidating the development of the agrarian landscape and prehistoric settlement patterns.

The research is taking place at 22 different locations spread around the country. The distribution of lakes, which provide the potential for pollen analysis, was the principal determining factor within this project. Collection and critical evaluation of the archaeological evidence was limited to within the pollen catchments around chosen lake sites.

The end result of the sub-project is expected to be a set of tools which can provide plausible definitions, and clarifications, of archaeological data in the DKC-database, and which can be used in mapping the interaction between human populations and agrarian landscape.

## 8. Multimedia project involvements

In 1997 the Danish National Museum made its first electronic publication *Gods and Graves* (<http://www.natmus.dk/kulturnet>) available on the Internet as part of the pilot project *Culture Net Denmark*. This publication, aimed at the general public, provides information on some of the more important sites from the Early Bronze Age in Denmark, and is unique in as far as it is the first time that the two large databases the DKC-base and the National Museum’s Object Register of the Department of Prehistory and Early History were combined and presented on the internet. Since the initial publication, *Gods and graves* has been updated to include the Late Bronze Age.

## 9. Danish Museums online

Another *Culture Net Denmark* project involving DKC is *DMOL - Danish Museums OnLine* (<http://www.dmol.dk/>). *DMOL* will provide a common gateway to information on individual museums – cultural-historical museums as well as art museums. *DMOL* itself

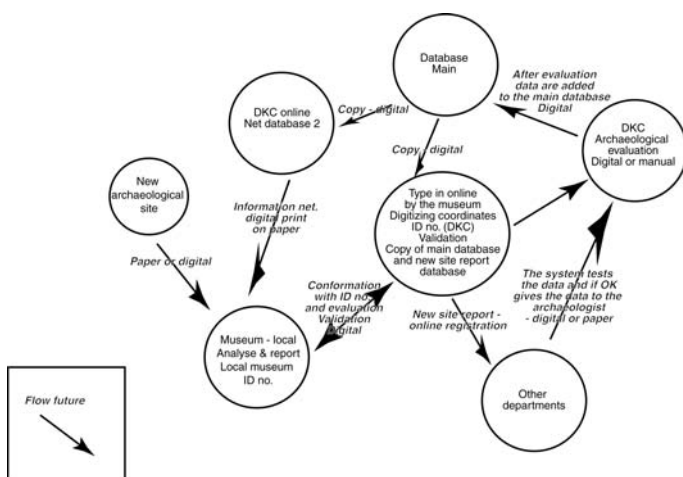


Figure 6: The future procedure for the processing of new site reports.

can be considered a virtual museum, containing key information on other museums and presenting some of the major artefacts or works of art from each institution. Essentially these will represent the highlights of each museum.

Altogether 150 museums will be represented in *DMOL*, with links to their own home pages, enabling the public to get more detailed information.

Apart from these web-projects, DKC has been involved in CD-ROM production in co-operation with other departments at the National Museum and the National Survey and Cadastre.

## 10. Online improvements

The DKC-developed GIS used with DKC online is about to be replaced with MapInfo Corporation’s MapXtreme mapping server. This will represent a quantum leap forward in that it will give the professional users of DKC online a whole new suite of possibilities. At present, as was mentioned above, there are several ways of searching the database, but with MapXtreme it will be possible not only to search but also to spatially analyse DKC data on interactive maps. Increased flexibility, thematic mapping and full layer control are some of the possibilities. But one of the main advantages is the possibility to show not only point data, but also line and polygon objects.

MapXtreme is also a sensible choice in respect of new site reports. The complicated flow of information connected with these was shown in figure 2, but with this new mapping server software it will be possible to have online registration of new sites with entry fields for information and a map window for point and click marking of the location - as a point, a line or a polygon (figure 6).

## 11. Where are we going from here?

DKCs involvement in the Changing Landscapes and Agrar2000 projects is nearing its conclusion, but steps are presently being taken to start new initiatives and to develop these multidisciplinary projects still further.

We have discussed a number of new initiatives in this paper: