Image Databases for Museum Staff, Visitors and the Outside World:
The Same Basic Material?

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Abstract

This paper deals with different kinds of image databases in museum surroundings. Based on the experiences of the National Musuem of Denmark, different target audiences are mentioned, which require different user interfaces, from illustrated text databases (collection mangement systems) to highly interactive image databases for unqualified visitors. The question arises as to whether it is possible to adapt the same basic material to the different user levels, or to what extent new recording material is necessary. Furthermore, the role of images in systems is discussed. How do we avoid images becoming dead ends in the systems? How do we make them searchable, and platforms for "association jumps?"

The National Museum of Denmark is a cultural historical museum covering Danish history from prehistoric to modern times, anthropology, antiques, coins, open air museum, conservation etc.

The museum is in the middle of an extensive rebuilding project. The purpose of the project is partly to create new exhibitions and facilities for visitors, but another important part (called the Documentation Project) is to make information available for visitors as well as the outside world, e.g. education. "Information," in this case, means all the knowledge existing in a museum, but normally hidden in archives and storages. Two important means of making that information available to a broad public are text and image databases. But before dissemination of information is possible, it must be assembled on a media well suited to electronic distribution.

Since most departments have been or will be involved in the documentation project, which runs over 7 years, it has not been possible for all departments to reach the same stage at the same time. This has turned out to be an advantage, since it has made it possible to test different approaches to recording and dissemination. We have had the opportunity to consider the nature of image databases as a result.

During the last three years, we have established text databases of almost half a million artifacts, of which about 100,000 have also been registered photographically. Consequently, we claim that we have an image database, in the sense that an image database is merely a text database containing images to be seen with text. An illustrated text database, so to speak. For the user, the image serves as another field to be retrieved from the database, but we know that no field in the database contains an image in itself, only an external reference to the place where the image is to be found by the computer program. It is, of course, important that the image be stored in a medium which gives the user immediate access to it. The image itself, however, does not provide for any further possible qualified searches as do the other fields in the database, such as measurements, materials, or codes of function and origin, all of which give us written information about the artifact.

The pictoral part of the database is an appendix, in a sense. It primarily serves an administrative function similar to storeroom information about the artifacts, or information about where to find the records in the manual archives. By establishing image databases of this kind, we can free ourselves from dependence on manual photoarchives. Now we can simply call forth the images on the monitor instead of going to the archive drawers. In our case, the images are photos of the artifact, but they could just as easily have been photos of the protocols or other related documents.

How lucky we are, that technology allows us to transfer images along with text when we establish electronic databases, especially since the combination of text and images has already been in use for many years in our manual archives! Explained in this way, an image database seems to be of obvious benefit, since a photo of the artifact is a necessity in an artifact database. Anything less would be a step backwards, since manual archives have been replaced by databases.

At the National Museum, all 80,000 artifacts from the Ethnographical Department have been text registered and photographed. The images are stored on a two sided Laser Vision videodisc. The database functions in two ways. First, you can search the text, and when the appropiate records have been found, you can look at images related to the text. The other way round, you can browse through the images and, after having found some interesting looking artifacts, you can retrieve the descriptive text. This database is useful to the museum staff working on plans for new exhibitions, especially in situations where the artifacts are stored away and not physically accessible. One record, describing one artifact, consists of up to 60 fields, 15 of which are currently searchable, including the address of the image. What we are talking about is simply a collection management system with familiar possibilities for searching and retrieving information. The browse function, however, focuses on the images and gives us a previously inaccessible visual perspective on the whole

collection. With 105,000 pictures in the database, it would take about 10 hours to browse through all of them using the slow step function.

It is important to remember that museum databases are usually computerized catalogues, formerly written on cards or in books. Will visitors enjoy having access to this kind of information?

It is often claimed that a picture is worth more than a thousand words, and it *is* true that a picture can create a series of associations. But these associations are rarely articulated in words, and in the administrative database there is seldom room for registration of such things. Nevertheless we have, at the National Museum, attempted to create a system for less determined users: the visitors coming in from the street. If we imagine for a minute that visitors are not primarily interested in computerized catalogues of the kind just described, what exactly do we need to make image databases more attractive and exciting?

We have to find out how we can integrate the images in the search process. As far as I know, it is not possible yet to create real picture driven databases, which allow you to point out any area of a picture and make it the parameter for a new search. In its most extreme version, such a database would involve pattern recognition on a scale which is not realistic right now. And besides, how would the system know what the user expected to see when an area was activated? Take an image of a hat. If the user points out a certain area, what kind of information could he then expect or hope to get? He or she might be just as interested in the material, the pattern, or the techniques used, but the computer still does not know which aspect the user wants. Maybe in the future the data programmers will be able to provide us with expert systems in which the image databases can recognize users and build up a universe of experiences for each individual user. Until then, we will have to use the written languages we have in common to describe elements of the images.

One way is to create links by hand, as has been done in some interactive video systems. By pointing at certain elements of an image, you are led to supplemental information, an explanation or a similar image. This kind of links will, however, always lead to an element of information which has been selected by the designer of the system. A system like that seems to be very flexible and dynamic, but what you really have is many possible combinations, all of which have been foreseen by the designer. Without doubt, creating such links by hand is a comprehensive task. A large scale image database is not well suited for such a treatment, and it is not possible for a human being to think out all possible combinations of the images. Which is fine - that is exactly what computers are for.

One year ago, The National Museum launched its first interactive video system for visitors. The title is "Danish Resistance during the German Occupation 1940-45." All of the material comes from the Resistance Museum, which is a department of the National Museum. The system is presented on two screens, a video monitor and a touch-screen, which operates the system. At the main menu the user can choose among "cinema" (looking at short films), "photographs" (exploring 4,000 photographs from the history of the Resistance) and "artifacts" (looking at objects from the time of the Occupation).

If the user chooses "cinema" a new menu will present a choice of titles. Each title leads to a 3-minute film, which can be stopped when desired. In terms of image databases, the other two selections - photographs and artifacts - are much more relevant. We operate with two different bases for practical reasons, though both databases operate in the same way.

The main entrance to the databases is by item or (for the photographs) geographical criteria. When you have passed through 2 or 3 menus, which can make your choice more specific, you will see the first image on the videoscreen. You can then browse through all the selected images. Accompanying each image on the computer screen is a short description of the artifact or the situation shown in a photograph. The right side of the computer screen shows a column of nine key words, which can be used to jump to other series of images described by the same key words. The key words describe classification, date, place and theme/subject of the image. A combination of up to three key words are allowed when starting new searches. The fascinating aspect of the program is that nobody has arranged the order in which you see the images. Each photograph or artifact has been registered one by one, and it is up to the the user to make his or her own way through the images, using the key words as springboard for what we call "association jumps." Of course, associations are limited to those planted in the system by the designer in the form of key words, but it is important to note that the springboards - not the routes - have been planted. From every single image with nine key words, in combinations of up to three words, there are 129 different possibilities for jumps to other images!

The impressive thing about image databases in museums is that by means of an optical storage media and the computer, you can do things that would not otherwise have been possible. In this case we are working with 4,000 photographs, 6,000 artifacts, and 1,000 archivals. How else could we have exhibited 4,000 photographs in a meaningful way, with several different forms of access and possibilities for combinations?

But the crucial problem is the basic material. Is it sufficient to be used as the nucleus of a system following the hypertext principles described above? Our experience with the Resistance system showed that we got into real trouble when we used the computerized catalogues just as they were. We did that with the artifacts, and the result, we must admit, may look rather poor when seen by an unqualified museum visitor. The information is scanty: the name of the artifact, a museum number, a date, a place, a classification and the names of the donor and user (which probably wouldn't be displayed) etc. That's all. The average visitor lacks context information: how was the artifact made? how was it used? What were the ideas behind it?

With the photographs, we had to record every photograph from scratch, and the result was much more satisfying, since the recording could be adapted to the design of the system. We were able to have a comment and almost always 9 key words for each photograph, while the artifacts are only accompanied by their names and a maximum of 5 key words. Because of this, though, it was difficult to combine the two databases. If you entered the artifacts once it was very difficult to go back to the photographs, so we chose to separate them from the beginning.

Should it be concluded, then, that traditional museum records are not well suited at all to dissemination to wider circles? The answer is yes *and* no, depending on the target audience. One of the most important things to remember is that different target audiences require different applications.

At the National Museum we operate with at least three levels of users. On the first level we have the professional museum staff, on the last the unqualified visitors, just walking in from the street to take a look. The users who make up the level in between might be characterized as qualified visitors, mostly amateurs with special interests. We are planning to establish documentation rooms and a kind of open storage or study collections with access to the databases for them, much like the application for the museum staff, but with access to only some of the data fields.

Likewise, outside the museum, there will be target groups with interests on a higher level, especially in the educational world. In the case of the Resistance video disc we have made an attempt to reach that group. The video disc and floppy discs with basic information about each image is sold at a moderate price. Included in the package is a sheet with bar codes, so that users without computers are able to use the disc in a meaningful way by means of a bar code reader. There are bar codes for each video sequence and about 110 bar codes for access to items in the three groups of material: artifacts, archivals and photographs. The publisher - the Danish Broadcasting Company - has also prepared some educational material that provides a guide to the video disc and suggestions for its use in the classroom. We already know that the video disc has been used by several schools and that teachers have made their own bar codes and hyperstacks to use with it.

This very positive experience is enhanced by another one, which should be foreseen by museums disseminating information on a large scale: the user's ability to check and find incorrect information. Some errors have been found in the Resistance videodisc, particularly wrongly placed photographs. Time will tell if large scale publication of images on videodiscs will create extra administration for the museum staff afterwards. Perhaps we should both hope for and fear it.

