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Introduction

Knowledge dissemination through digital media in museums and exhibitions – that is the title of this contribution. We will refer to the strategies of dissemination and the development of digital media. It is important to mention that all the applications we will talk about have the visitor of an exhibition in mind as a prospective user, not the expert.

Before starting with some remarks on dissemination strategies, it is important to mention that the "old and honourable exhibits", which are the assets of each museum, should always be the focal point of all our endeavours to present information relating to them. I think, dissemination is therefore always a process of reconstructing relations between the exhibit and the original context it once has been part of.

By presenting some of the projects "märzdesign" has carried out, I want to point out three different strategies which have turned out to be useful, even with differing aims.

"1848" – has a databank-solution in the back-ground. These applications make sense with the presentation of optional knowledge.

In this case it is the origin, the biography and the political orientation of the about 800 members of the Paulskirchen-Parliament in 1848 in Frankfurt/M.

There are three ways to get information on these members:

1. On their places of origin by use of a map of the German States
2. On their names by use of an index
3. By activating filters like "profession" or "political orientation" the selection can be reduced right from the start.

In this application the idea of context orientation does not play an important rôle. Links are only possible if the databank has a hyper-textual structure and enables unlimited relations – this kind of structure is known from the Internet.

The accumulation of knowledge is structured by the interaction between the user and the computer. The users become co-authors: by finding-out reasonable links themselves they extract the information they are searching for.

Therefore dissemination strategies based on data-banks are only possible if one of these conditions apply:

1. The user has the necessary background-knowledge enabling an orientation in such a structure or
2. There are only reduced options, like the "1848"-application, so the user will hardly ever get on a wrong track.

"Picture Gallery, Berlin" – as a second type of dissemination strategy I want to present an "exhibit-oriented" application. This is a specific way of presenting objects of art. In deviating from the traditional mono-graphical approach the objects are presented and analysed regarding the historical background at the time of their creation.

First a selected painting is described from its visual impression including phenomena typical for that time and style (e.g. "madonna" in the context of early Netherlands paintings).

This is followed by a selection of short presentations relating to the themes and motives of the picture in connection with their cultural, artistic and historical context (e.g. "function" or "perspective" of the picture).

It is obvious to imagine that by this kind of application also technical objects, historical objects of every-day-life or objects of natural science can be presented in meaningful contexts. Due to the high effort the development of this type of application necessitates, the presented exhibits should be a typical example. Exhibit and digital application, both take part in the presentation of fundamental contexts pointed out in an inductive approach. The user's intrinsic interest is a prerequisite to make use of this type of application, which offers a cognitive approach leading far beyond the meaning of the single exhibit.

The Classical Antiquties application – the third strategy is narrative in character. Background knowledge or information which are difficult to show in an exhibition are presented in short sequences. Integrated into these sequences are images of objects shown in that exhibition. In contrast to the previous applications the approach is more deductive – from the presentation of the contexts the user is led to the exhibits around him.

As an example for this more narrative type we present the application produced for the Antikensammlung (Classical Antiquities) Berlin.

The topic "Housing in Antiquity" describes the way of living in the residential area of a Greek city in the 4th century BC; the objects illustrating that topic are mostly exhibits from the exhibition.

Another example from that application demonstrates the rather complicated process of painting and burning ceramics in antiquity. The use of cinematographic techniques of presenting this process, enabled by digital technology, is especially impressive in this sequence.

The development of applications

This part will give you some more detailed information on the production of the "Classical Antiquities" (Antikensammlung) application.

The following refers to multimedia applications of the narrative type, like that one in the Antikensammlung. But I think many of the aspects I will discuss also refer to the other types of multimedia applications in museums as pointed out in the first part.

When talking about multimedia applications in museums exhibitions two points have to be kept in mind.

First: a multimedia application in a museum is only one part of a whole set of information media and therefore only one part of a whole integrated system.

And secondly, the best place to present information in an exhibition is to have it where it is needed by the visitor, in the vicinity of the related objects.

Some remarks on the set of information media we have at hand when planning an exhibition. There are

- object labels, collective informative texts referring to several objects and informative texts on the wall
- printed information sheets for the use of visitors, short guides and catalogues
- audio information systems
- audio-visual systems like multi-image shows, videos and multimedia applications.

The advantage in making use of such a well developed system becomes obvious if you think of the specific advantages each of these segments has. An informative text on the wall can be short and well structured if the more elaborate information can be placed in the printed information sheets or the short guide. The audio information can be more like a radio play, including a more emotional approach to the objects, if the essential information is already presented in the text information.

To make use of the whole system of information media in an exhibition necessarily leads to redundancy of information, which is, after all, not a bad thing – as long as it isn't boring. That is what theories of learning tell us.

Placing information media close to the point where it is needed by visitors means integrating multimedia applications into the exhibition area and not presenting it in a room adjacent to the exhibition or even separated from the exhibition area as it is frequently practised nowadays.

Before I mention some more general points let me describe an "info-station" as we have called the place of presentation in the exhibition of Classical Antiquities in the Altes Museum, Berlin. There are three info-stations having the same general design characteristics as the whole exhibition – they are areas a little separated from the originals:

Users are sitting on a bench, about 2 meters away from the 37inch screen, they can turn their heads and see the originals. The screen is integrated into a large wall, which keeps the daylight away coming through the windows behind the screen. In line with the middle of the screen there is a console mounted to the bench with the user interface. The loudspeakers are installed overhead the users, the volume is adjustable within pre-set limits.

Some guidelines for developing multimedia applications for museums

Multimedia applications should be a supplement to exhibitions - not a substitute
When using narrative multimedia applications the users have already seen parts of the exhibition, they must not be convinced to visit the exhibition by presenting parts of it. Contexts should be presented, the objects once have been part of, details of the objects could be pointed out, or technical aspects of manufacturing these objects could be presented.

Visitor's time should not be wasted but used to the optimum
Every minute visitors are sitting in front of the screen feeling bored is wasted time, even if are only staying because they think the application will become more interesting any second. An application should try to keep the balance between offering good edutainment and leaving users enough time for looking at the original objects. Therefore multimedia applications presented in an exhibition will not have that much depth of information.

The way of presenting the multimedia information can stimulate communication between users
Workstations with 15 or 17 inch screens can only be used by one or two persons simultaniously, that might produce the feeling of isolation, especially when the visiting group has more than two persons. That was one of the reasons for choosing a 37-inch screen for the presentation; six to eight persons can sit in an info-station – only one can control the programme through the user interface. A situation demanding communication if users want to participate in the selection – and it works.

User's curiosity should be stimulated
Curiosity is one of the behavioural dimensions users need to make full use of the multimedia application. The application itself should foster it and should offer ample opportunity to use it. Install different ways of navigation leading to the same screen, avoid a description how to navigate, let users find out their way.

According to one of the latest surveys an overall average of 38% of the German population has interest in trying out technical novelties, this interest raises with better education and is especially well developed in the group 14 to 29 years of age, decreasing continually with age.

Take into account the expected visitors
To be honest, we don't know very much about the visitors of our museums but the little we know we can make use of. We do know that visitors of a collection of Classical Antiquities - apart from school-classes which normally have booked a guided tour - usually are from the higher age-group and that they are well-educated. For the installation of a multimedia application this means, that a large majority of visitors are not very experienced computer users. For the museum of Classical antiquities we have therefore chosen a user situation which comes close to the private use of TV rather than the use of a computer system.

Appropriate interactivity

High interactivity is often enough thought to be an essential feature of multimedia applications. For the sake of high interactivity information is frequently broken up into very small pieces, leaving behind only fragments of a chain of arguments or isolated steps of a complicated production process. Appropriate interactivity would keep the chain of arguments uninterrupted as well as the various steps of a production process. On the other hand, a very simple form of interactivity should always be possible: the chance to change to another contents or to leave the application at all.

No extensive reading texts on the screens

One of the frequent solutions for the sound-problem is to replace spoken commentary by reading texts. Since text-files don't need large storage capacity you can sometimes have complete books on the screen. Since reading speed of individuals varies considerably and reading texts have to be much more formal than spoken texts, I think that this is a bad solution for the sound problem.
Another argument against reading texts: proof-reading is usually done with a print-out and not on screen. There isn't any reason to expect it differently from users of a multimedia application.

You cannot do without recorded comment and sound

The more senses are involved in the acquisition of information the better it is retained. It is not only the commentary, but also the sound which can support a series of images or evoke certain associations in the mind of the user. If an application is installed in an exhibition room, it is important to have a technical solution which doesn't bother the other visitors too much. We have installed the loudspeakers above the users, the volume is individually adjustable within pre-set limits – and we are quite happy with it.

Find a user interface as simple as possible

About one third of the German population uses a computer either in the office or at home. The use of computers however decreases with age, in the age-group "60 and above" we only have 2% of computer-users. Museums have to take into account that far more than two thirds of their visitors are non-users regarding computers. If we don't want to build a barrier in the use of multimedia applications, the user interface must be as simple as possible.
After some research and some tests we have decided to use a modified trackball and a "go" button. Furthermore we decided to avoid any written instruction on the user interface but to install a help button.

Navigational structure must be easy to understand, the screen design should be clear

All three info-stations in the exhibition have identical screen-design and navigational structure. At any time the user can go back to the start-screen or can change to another topic directly. In any of the three info-stations the start-screen lists the topics available in that particular station and in addition the topics available in the other stations.

Contents-centred design of each topic

I think this is the most important point of all. In the application for the Classical Antiquities we have developed each topic contents-centred – there is no principle how a topic is presented except the one that users always get an introduction after they have clicked on a topic. It kills interest very rapidly if a users can imagine how the next topic will be approached without having ever seen it before.

Evaluation

We hope to have our first results of the evaluation available by the time of the EVA conference in Berlin.