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The focus of museums has shifted from objects to phenomena. This change is also reflected in the information systems that are used in museums. Traditional systems have serious difficulties when it comes to storing the new approach. This means that, in current systems, a museum object has only one voice: the official one.

In order to provide museum objects with multiple voices, a new role must be given to the museum's information system. Instead of seeing it as a static archive, the information system is considered as a tool for the interpretation process, in which the insertion of the object is the starting point. In the 3D-Bridge project Jyväskylä University Museum has started to develop an application for multiperspective information handling. Currently it is used for virtual reconstruction of the campus area.

Memories in the warehouse

Developing a multiperspective information system for culture historical use

In recent years the focus of museums has shifted from object-centricity to a more anthropocentric view. However, from the information system design's point of view, it is very tempting to outline the museum as a collection of objects. That is, to see the museum as a place that stores objects and holds some information attached to them, like a warehouse. This allows the system designer to take advantage of traditional database design patterns that are suitable for stock accounting. This approach, however, is doomed to fail.

What makes this issue more complex is the fact that museum is a collection. However, storing objects is just one part of museums' nature. Museums (like libraries and archives) are social memory organizations; they are a collection of research material and a collection of interpretations. They even are a collection of empty spots, things that are not in the collection. The meaning of a museum's collection is something that is defined by a viewer's point of view. For an animal activist, a collection of fur farming tools and leather production is a collection of equipment used for mistreating animals. On the contrary, from the research's point of view, those tools may be seen as a timeline that shows the technical development of fur production. For a retired farmer those tools are full of memories from the past. Still, it is the same collection, only the interpretation varies.

The change in the focus of museums is also reflected in the information systems that are used in museums. Traditional systems perform poorly when it comes to storing alternative interpretations in the system. Overall, there are a very limited number of views to the material available. There may be information about donation, restoration, ownership, subject index and some notations about context. All these views are predefined by the system designer and adding a new view is usually impossible without a redesign of the whole database. There is no room for the farmer's memories or for the animal activist's view. This means that, in current systems, a museum object has only one voice: the official one.

In order to provide museum objects with multiple voices, a new role is given to the museum's information system. Instead of a static archive, the information system must be seen as a dynamic network. In archive mentality an object is stored in the system and the process inside the archive stops there: the object is ready when it is saved. However, if the information system is considered as a tool for the interpretation process, the insertion of the object is the starting point of the process. The dialog can continue through the system, and the dialog process remains visible. Some parts of the net remain unchangeable, but new parts keep coming in, and those new parts change the way older parts are seen. This approach is very useful for research purposes, for example, for culture historical reconstruction because it gives a tool for the documentation of the research process. By following the dialog, the roots of the interpretation can be seen.

In the EU-2000 project called 3D-Bridge we at Jyväskylä University Museum started to develop an application for culture historical reconstruction. As part of the project, we wanted to reconstruct our university's campus area in its 1920's appearance as a social milieu and an architectural entity. In order to do that, we needed a tool that would allow different types of views to the core material and could be used for work with interactive 3D-models. Two applications were developed for this purpose: a web-based information system called IDA (Ideal Documentation Archive) and IDA3D for virtual reality aspects.

IDA combines database structure and hyperlinking in order to produce a multiperspective information system that allows an unlimited number of different types of views to the protected core data. IDA makes a strict separation between targets and documents. A document is any digital file (like image or 3D-model) that is uploaded to the system. After the upload the document is attached to a target or targets, since documents cannot exist in the system without being linked to a target. The target can be a painting or an event or any other object stored in the database. The system has no predefined data structure for targets. This means that every organization is free to define what kind of information they want so store. There are plans to implement some sort of template function that would allow some presets for data structure. This would make it easier to set IDA up for new users.

IDA's way of handling multiple views to the core data are arguments. Arguments are html-documents with text and links to the database material. Arguments belong to the project and are therefore organized by projects. Arguments are constructed with a built-in WYSIWYG editor. It is possible to use any item from the database in an argument through IDA's link board. When an item is picked from the link board to the argument, it is actually linked to it. By following the link in the argument, it is always possible to find the original data. Links in IDA are always bidirectional, so every item also "knows" when it has been used in the argument, and the link back to the argument is shown among the item's other information. For example, a transcription of a farmer's interview could be inserted in the database as an argument. Then, images of the tools that are mentioned could be linked to the text. As a result, there would be an illustrated transcription that is easy to follow even for a person that does not recognize the names of the tools.

From the accessibility perspective IDA's arguments are one way to approach material instead of traditional queries. Queries can be problematic for the general public because their efficient usage requires knowledge of databases in general, and some information about the content of the database is needed. Projects create a new analysis of the material, but at the same time, a new user interface is created. One might say that every project in IDA is a mini-exhibition, which has a unique perspective to the material.

Unlike in many systems, images in IDA are treated in a non-atomic way. Usually images in

databases are treated as atomic objects, i.e. something that cannot be divided in smaller parts. However, it is very common that the content of the image is not one, unified object. Therefore, the system must provide tools for handling parts of an image. IDA supports linked cropping of images. Linked cropping creates a new image document that can be used separately from the original image. But unlike with traditional cropping, the connection between images still remains. It means that the cropped image always knows where it was cropped from, and the original image is aware of all images that were cropped from it.

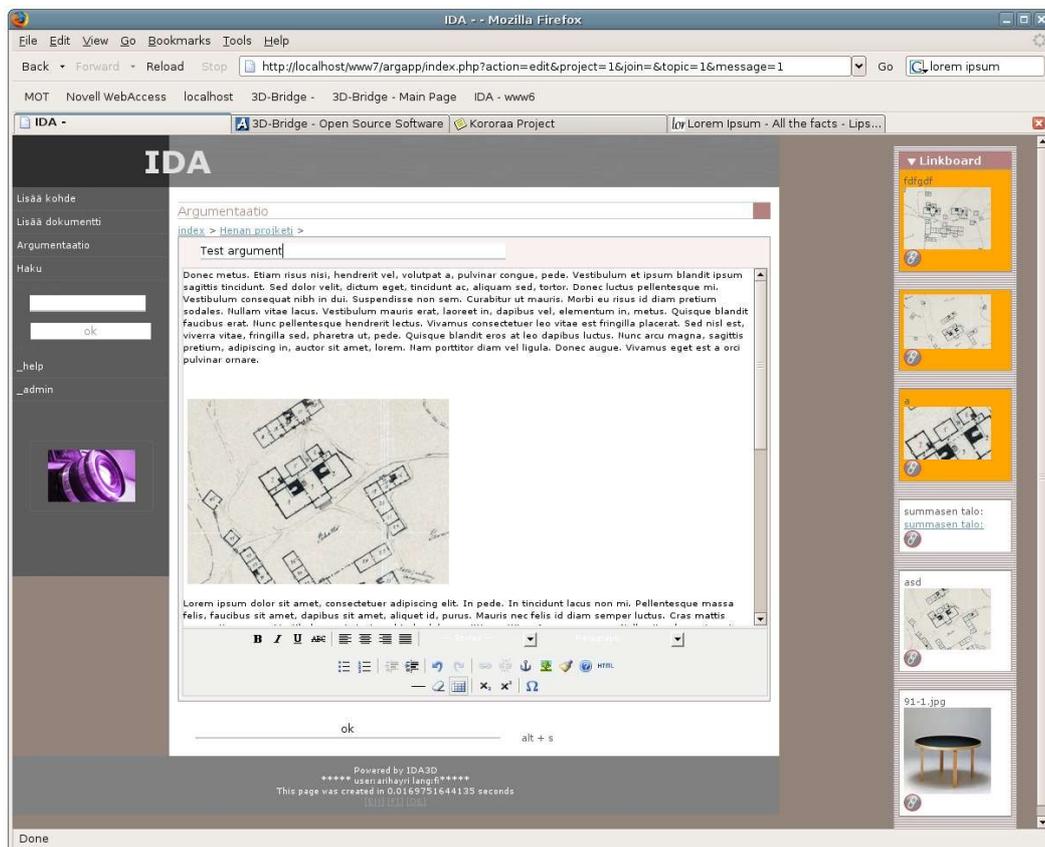


Illustration 1: The argument editor. The linkboard and its content is on the right.

Some interesting possibilities appear when the non-atomic treatment of images is combined with the argumentation structure. For example, if a study is made on how the Virgin Mary is painted in altar paintings, every appearance of the Virgin Mary could be cropped from the altar painting images. Then, the researcher could write notes about these images using them as illustration in the arguments. Now, there would be a new perspective to the altar paintings based on only one of their aspects. Or in the case of art historical vocabulary, the examples could be cropped from actual targets in IDA. The Doric pillar example could be cropped from the image of the Doric temple. However, now there would also be a link from the Doric temple to the vocabulary and, therefore, the content of the Doric temple would be enriched.

The other part of IDA is its ability to store 3D models. In IDA, a 3D model is just one type of document. However, in order to make the actual real-time presentation, the separate 3D client was developed. IDA3D is based on an open-source rendering library called OpenSceneGraph. IDA3D creates a virtual world based on the models and information provided by IDA. Models are placed on layers. There could be separate layers, for example, ground, vegetation, wooden houses or buildings that were planned but never actually built. This makes it easy to compare and, if necessary, to isolate different parts of reconstruction with just one button press. One important aspect is that because the

models are attached to the targets, 3D models preserve their context and meta-information in IDA3D.

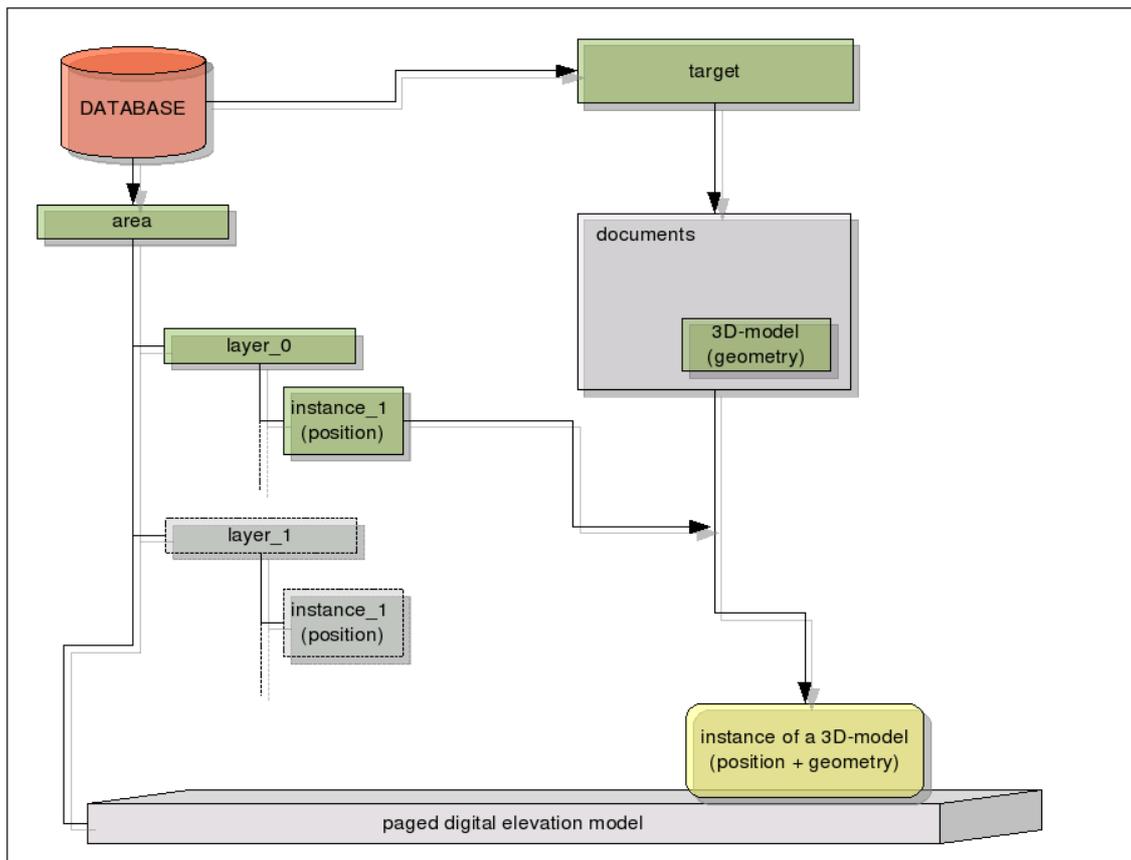


Illustration 2: Structure of the real-time visualisation system.

The IDA system will be accessible for everyone interested in it. Both programs are released under a free GPL license and currently they are under heavy development. More information can be found on the project's website: <http://www.arthis.jyu.fi/ida/index.php>.

Jyväskylä University Museum

The Seminaarinmäki Hill in Jyväskylä has housed museum activities for already a hundred years. In fact, the beginning of the museum's collections can be dated to the 1860s. The Jyväskylä Teacher Training College, the first Finnish training institute for elementary school teachers, was established in 1863, and started to collect didactic specimens. When the College of Education became a University of Jyväskylä, the museum also received the status of university museum. In 1980, it was divided into two separate departments: the Section of Cultural History and the Section of Natural Sciences. Over the decades, the Jyväskylä University Museum has evolved from an ethnological collection maintained by training college students into a museum which presents the history, functioning, and the general cultural scene of the academic community. The museum functions as a training post for museology; a teaching museum where students can receive practical training in museum work.

website: <http://www.jyu.fi/tdk/museo/museum.html>