SPACES FOR CREATING CONTEXT & AWARENESS - DESIGNING A COLLABORATIVE VIRTUAL WORK SPACE FOR (LANDSCAPE) ARCHITECTS

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1 Introduction

This paper addresses the design of a collaborative virtual work environment for (landscape) architects. More specifically, it uses ethnographic studies of work practice for exploring the metaphor of *Manufaktur* as a space populated by workplaces, tools, materials, people, exchanges with the outside world, and links between these different elements. We conceive of the *Manufaktur* as a space, which supports (landscape) architects in keeping the context of a project for particular tasks and activities present.

Context, and appropriate visualisations of context, are crucial for the support of work which is highly complex (in terms of parameters and materials to hold present), cooperative, and distributed, with a fluent mix of tasks and people. This context is constantly changing with the project and tasks at hand, the people involved, the progressing of ideas and solutions, the multitude of documents that are activated, changed and created in this process. There is therefore a need for a workspace which is easily customisable, affording the views of a project or task that are most relevant at a given moment.

Our fieldwork material highlights the ways in which diverse materials are assembled, arranged, manipulated and displayed in practitioners' workspaces – around their desks, rooms, furniture and equipment. Much of this material is graphical and visual. Some of it is precise and detailed but much of it is conceptual, metaphorical and in formation. It forms a context for their work but,

more than this, organising their materials importantly *constitutes* their work.

We have developed an early prototype of a 3D computer-based environment, the *Manufaktur*, to support these work settings. It enables practitioners to place, orient and move materials, and themselves, in three dimensions, analagously to their use of physical space. Elsewhere we describe the system in more detail, with a variety of contexts of use (Büscher at al. 1999). Here we focus in particular on the need to keep the conceptual bases of a design project present and available in the course of the work of design.

2 Contexts of an (architectural) design project

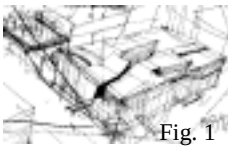

Fig. 1

Architectural design proceeds through concepts, which are gradually made to interact with the 'givens' of the place of the building, the specific requirements, technical constraints, building regulations, etc. Imagine the start of a large building project, for example *Eurocity*, a large cinema center which is being planned by one of our user partners (Architekturbüro Rüdiger Lainer). The idea is to create one large, monolithic volume, which "barely touches" its surroundings, and is wrapped in a floating "skin" which is used for a variety of light effects. Inside, the movie theaters are piled up like "boulders" (Fig. 1) (Tellioglu et al. 1998).

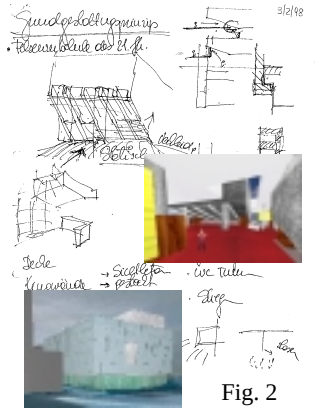

Fig. 2

This image forms the core of the project's conceptual context. It remains fuzzy, as it needs to be held open to alternative, yet to be explored solutions. Also, qualities such as distance ("barely touching"), density and compactness (the interior space as "monolithic and hermetic"), and texture (the skin as a fabric rather than a smooth glass surface) require the construction of rich narratives in order to be grasped by others so that they can fill in their own ideas. Important elements of this narrative are images (collected from artbooks), a scale model, metaphors, sketches, abstract 3D visualizations and some preliminary CAD drawings and calculations.

In an early project meeting the principal architect explains the design principles and produces an annotated sketch (Fig. 2). He uses metaphorical descriptions for the building's skin, the role of light as a "calm surface" onto which images are projected, the "stony, grey" movie theaters, and points to the "dramaturgy of space" to be created by combinations of material and light. Some of these ideas are translated into 3D visualizations, others into CAD drawings. A list of

material is produced, the main technical consultants are contacted.

A main question is how to communicate the concept to the client, to technical consultants and local authorities so as to convince them and engage them in a cooperative process. But also how to keep the concept alive within the team when it comes to drafting detailed solutions, discussing design changes, evaluating alternative realizations. Our observations suggest that the conceptual space of the project is simultaneously constructed and presented through the evolving set of visual, graphical and textual material. What emerges is that manipulating the presence and absence of materials and bringing them into dynamic spatial relations in which they can confront each other are not just a context or prerequisite for doing the work; rather, they are an integral part of accomplishing the work itself. *To manipulate the context **is** to do the work.* Typically, what is important is not just to create or change a document or other materials, but to do so in the presence of and in relation to others.

So for the more detailed work on aspects of the cinema center, such as the "skin", the construction of the façade, or the lighting, one must connect an evolving set of parameters, each of which is represented through multiple visual and textual documents. An example is the search for material for the "skin" which starts with a description of a glass surface with an "irregular, textile-like structure", as expressed in a series of images, sketches, and a preliminary list of requirements. Searching for suitable material is done in multiple conversations with consultants and fellow architects, by glancing through journals, browsing through product information on the Internet, participating in a seminar. At the same time a façade consultant is asked to conduct inquiries about a variety of techniques for giving glass a textile-like character. The results of this search are present in a series of letters, faxed and annotated. Images of textiles are scanned, small sample elements produced. At a certain point the principal architect summarizes the different methods, each with a small explanatory sketch, and re-defines the tasks to be completed.

For the architect who is working on this task, information about suitable material consists of a growing set of resources and documents: inspirational resources of various kinds – images of glass as a textile-like surface for light effects, architectural projects, samples of textiles, product information from various sources (catalogues, the Internet, articles), etc. In team sessions a narrative is constructed which knits them together. This narrative needs to be placed and viewed within the conceptual space of the project in order to be fully understood, evaluated and further developed. None of it stands for itself and the architects constantly refer to these documents as the context of their work.

They do this in two ways. First, through linking documents or particular parts of them. As a large part of their world consists of paper objects, linking is done by

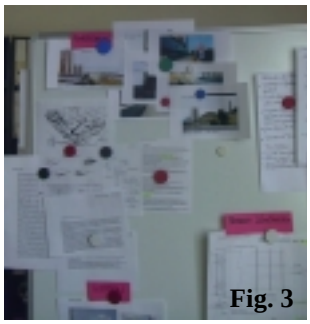
Fig. 3

spontaneously pointing to and highlighting particular places in a fax, CAD drawing or sketch, creating annotations, etc. Also, when discussing a design problem, they spatially arrange the pertinent material on their desk or on the meeting table where it forms a visual reminder of context (as in this image which shows part of the documents representing the design concept, Fig. 3). An advantage of these spontaneous arrangements is that they reflect the current thinking around a design problem. However, much of the project material, unless visibly placed on the desk, tends to get 'lost' in the maze of tasks and parameters to consider simultaneously. Just moving a concept sheet, an association image, or text into a pile of documents makes it invisible, filing it may make retrieving it cumbersome.

3 The 3D Manufaktur space

The 3D *Manufaktur* workspace will support the configuring of multi-media documents to specific *views* of a project. It will contain or integrate a series of applications, some of which are underlying services (exploring & navigating technologies, linking facilities, support for sharing and awareness, document management, etc.). We currently have the vision of having the *Manufaktur* running as a kind of 'desktop' (e.g. using Active Desktop). The workspace ('desktop') is tightly coupled to documents within their 'native' applications. For example, double clicking any of the documents in the workspace will launch the proper application with that document, and changes to it will be updated on the 'desktop' in near real time. The objects can be moved, rotated, etc. The prototype is developed in C++, using COM/ActiveX technology for integrating the documents, and DirectX v.6.1 for rendering them in the 3D environment.

A workspace of any team member of the *Eurocity* Project may at some point contain hundreds of documents and many more links. One approach to holding these documents and relations present is the notion of 'views'. We are experimenting with different types of views to be generated in the 3D *Manufaktur* space. A collection of documents that are thematically related and related through work practice may be arranged spatially and manipulated as a particular view of a project or task within it. This view may contain a series of 'small worlds' (views within a view). So, for example, a view of the conceptual space of *Eurocity* could contain representations of views of different workspaces within the project – the construction of the façade, the search for material for the "skin", the lighting concept, project management, etc. Each of these 'small worlds', when double-clicked, may expand into a full view of the

documents that are relevant to the work at hand. Similarly, a view of the workspace for developing the lighting concept may contain representations of all other views relevant to this task. In sum, views may fulfil different functions:

- they may narrate the history of the project
- they may give a "full view" of all relevant concepts which are simultaneously present
- they may support the viewing of a particular document within a particular context of documents
- they may be both, a workspace and a kind of pre-view of a representation for an outside audience
- they may be shared, within an office, with the client, the construction engineer, etc.

We will develop a series of templates for creating view-types which can then be used and customized. The *Manufaktur* currently opens as an empty black space with the possibility to insert 'implantations', such as (transparent) walls, for demarcating areas. Spotlights can be used semantically – special colours for particular views (this is already done in the architectural office) and for highlighting. If a document is moved into the red area, for example, this might mean prioritizing, alerting, etc. As a next step we will experiment with topographies such as a model of an area or landscape or a rotating stage in which to place material.

Particular to our approach is that rather than attempting to structure the information field through the use of automated mechanisms, the presence and arrangement of materials must emerge from the flow of the work itself, in the kinds of ways described in our fieldwork example.

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4 References

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