

Discussing Plans via the World-Wide Web

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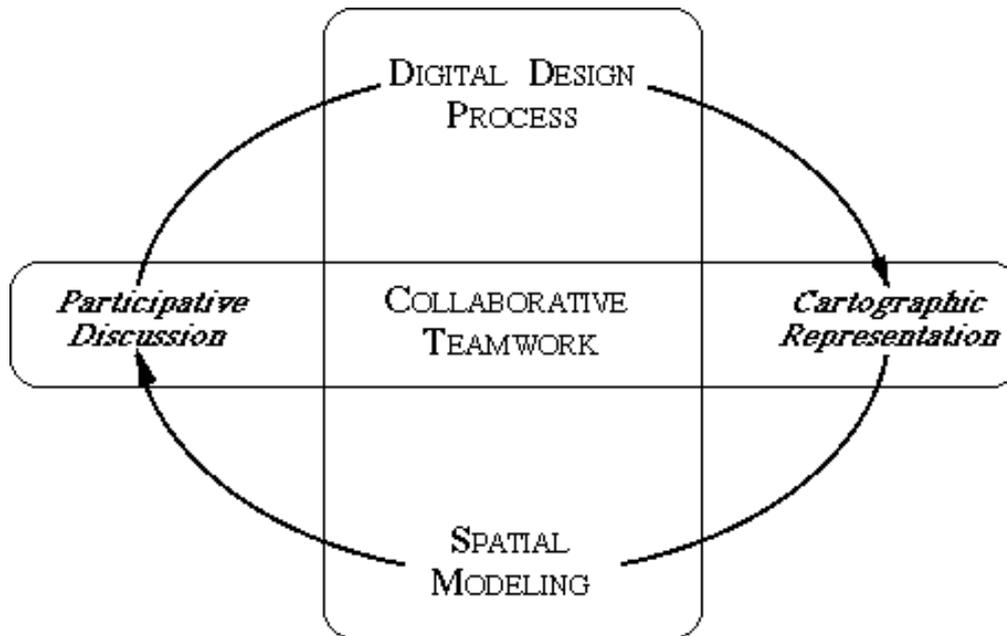
1 Introduction

Collaborative teamwork often goes beyond same place - same time situations: new information technologies allow for distributed asynchronous cooperation. In urban planning procedures, the elaboration of a land-use or building plan may be considered as the common goal of all actors. But in general, the participants do have conflicting subgoals. Computer supported cooperative work (CSCW), therefore, must include tools that allow for discussions in distributed workgroups. GMD's Zeno system aims at structuring such argumentation processes and at mediating between opposite interests (-> section 2).

Creating, discussing and deciding a spatial plan is a complex (**digital**) **design process**, which implies heterogenous design tools, competing participants and fuzzy decision bases. As an electronic discussion forum, Zeno helps to clarify implicit understandings of single actors and makes decisions more transparent. By its WWW-based, platform independent technology, Zeno makes heterogenous documents easily accessible for a broad range of users.

The dimensions of **spatial modeling** go from verbal description of spatial situations over "flat" maps to three-dimensional architectural models and Virtual Reality graphics. The contributions to a planning discussion forum talk about space via verbal expression, while the project to be discussed may be visualized by cartographic map representation. On the other hand, positions and arguments of discussion participants may be considered as attribute data for plan elements and therefore may be seen as part of a spatial model.

Currently, I am working on the technique of connecting the argumentation model of Zeno with 2D geographical data via hyperlinks. Adding a spatial reference to discussion messages is the topic of section 4, while section 3 first describes the other perspective: VRML, the Virtual Reality Modeling Language, which is used to define online maps in a prototype implementation, is a proper means for providing graphical scenes as user interface to complex information spaces, such as a discussion forum.



The layout in figure 1 shows the relation between the conference's main themes and the cartography-augmented Zeno discussion forum. Linking architectural design plans and a discussion forum is only a little step beyond working with two-dimensional spatial plans. Zeno could be used to discuss city planning projects within the concerned administration and with architects, investors and interested citizens, making planning more efficient as well as more creative (-> section 5).

2 The Zeno discussion forum

Zeno is a discussion forum that is used to structure argumentation processes. The current state of the discourse shall become apparent for the participants, who become informed about stronger and weaker arguments, e.g. [Gordon et al. 1996].

Zeno is based on World-Wide Web technologies and accessible via any Java-compliant HTML browser. For each project discussed, Zeno provides a shared workspace, accessible to all participants. This feature is owed to a Java-based reimplementation of parts of GMD's Basic Support for Cooperative Work (BSCW) system [BSCW]. Zeno is an assistant software tool in the sense that it supports the task of a human mediator.

A planning discussion, mediated by Zeno, may for example turn around a draft map for the area, where an urbanisation project conflicts with the actual land-use map. The participants of the discussion, whether professionals like planners and architects, or lay-persons, in their argumentation in general refer to specific elements of the plan (areas, parcels, lines, points). The link between the discourse message and the map, though, is purely a cognitive one, expressed by (qualitative) verbal descriptions like "north of ...", "near ...".

Additionally, scanned maps are proposed to illustrate the situation discussed. But current WWW techniques allow only for non-interactive raster images, the image-map technology being too complex to realize for a whole plan.

Within the scope of my Ph.D. thesis, I am working on a further integration of Zeno with cartographic representations in the World-Wide Web. In the following two sections, I propose a prototype system that supports four types of interaction:

- access to map locations, arguments refer to,
- attachment of a geographical reference to a new argument,
- access to discussion messages through map symbols, and
- insertion of a new message for a map object or region.

<i>perspective:</i>	starting from Zeno	starting from plan
<i>function:</i>		
presentation – to get information	navigate to map location related to an argument	retrieval of messages for map object
interaction – to participate	establish link to map for new argument	insertion of a message related to a map object

Figure 2 shows these possibilities, ordered according to whether the action starts from the discussion forum or from the plan, and whether it is restricted to data presentation or concerns real user interaction:

3 Maps as user interface of a planning information system

Graphics are a common means of compressing information. The World-Wide Web itself is an example of a graphic-heavy information system. More and more Web sites use images or interactive graphics for cartographic representations.

With the Virtual Reality Modeling Language (VRML), an Internet standard for describing three-dimensional scenes [SDSC], came up the idea of using VRML 'worlds' as user interface to multiple information spaces [Lochter et al. 1996]. Reducing this concept to two dimensions and to real instead of virtual world representations, lead me to the examination of maps as user interface to the Zeno discussion forum.

In the context of a participative discussion of a draft plan, this means that the citizen, who enters the discussion forum via his WWW browser, first views the draft plan itself. He may zoom and pan the plan to view some details that are most interesting to him. By clicking on a plan element, the browser loads some portion of the current public discussion, where positions and arguments are related to the clicked object.

The discussion messages in the Zeno system can contain links to any other kind of Web document, like the text of an expert opinion or a law paragraph, but also photographs, sound and other types of multimedia documents. Therefore, the plan in the above scenario can be understood as interface to a large planning information system. As part of the World-Wide Web, this subsystem would - of course - suffer some of the disadvantages of the WWW, when seen as an information system: inconsistency and redundancy of data.

As a second feature, when selecting an object in the digital draft plan, the user could be proposed to add a new discussion message referring to this object or its neighborhood. But to maintain the consistency of the argumentation model of Zeno, the insertion of a new message without knowing related arguments is not desirable. The alternative of sending messages as a reply to existing positions, still keeping an opportunity of submitting a geographical reference to the message contents, is discussed in the following section.

4 Completion of discussion messages with spatial reference

Argumentation elements in Zeno usually refer to existing issues, positions or arguments. In the terms of electronic mailing, a new message is send to the Zeno server as a reply to an old one. This is how a complex argumentation structure is constructed by the discussion participants with the aid of the mediator.

In a discussion forum with a cartographic extension, the user should always be offered to view a map of the spatial situation, when browsing discussion contributions. In my system outline, this means to have a

``show plan" button for every argument, which makes the display switch to a map representation with a zoom and highlighting of the concerned spatial object.

In addition to the presentation function, any user, who adds a discussion message to the forum will be constrained to indicate an object, his message is referring to, on any plan in the forum. In this case, a ``cooperative hypermap" is automatically generated.

5 Computer-mediated discussion of architectural plans

While the theoretical considerations of problems and opportunities of cooperative hypermaps are just beginning, I yet started to implement the prototype system, whose features were sketched in section 3 and 4.

I used the Virtual Reality Modeling Language (VRML) as an open standard for publishing vector graphics via the World-Wide Web. VRML provides the technique to define links from scene objects to any WWW address. Discussion messages in Zeno (in the forthcoming version) are nothing else than a special kind of HTML document.

On the other hand, VRML also offers the possibility of defining viewpoints in the scene, so that a zoom to a specific object could be implemented, when a discussion message refers to it. The exact functionality still has to be fixed when writing these lines.

The use of VRML for visualizing geographic data, in fact, is a ``misuse", as it does not take advantage of the 3D abilities of the data format. (Those even produce problems, e.g. when ``navigating" a 2D map.) An application in the field of CAAD would take the full advantage of combining 3D spatial modeling with asynchronous cooperation.

I here emphasized the use of a discussion forum in the context of a public participation process, which generally is prescribed by urban planning laws for the modification of a land-use plan. While it is not an obligation nor common usage to have a public debate about architectural projects, such a step could bring some advantages to architecture, too. Most of all, the publication and discussion of critical opinions could reduce costly and time-consuming delays due to legal conflicts, after decisions have been taken.

6 References

[BSCW] GMD - German National Research Center for Information Technology: Basic Support for Cooperative Work homepage
<http://bcs.w.gmd.de/>

[Gordon et al. 1996] T.F. Gordon, N.I. Karacapilidis, H. Voss, A. Zauke: Computer-Mediated Cooperative Spatial Planning. In: Proceedings of the 3rd International Conference on Design and Decision Support Systems in Architecture and Urban Planning, Spa, Belgium, August 18 - 21, 1996, to appear.
<http://www-fit-ki.gmd.de/projects/zeno/papers/abstracts/abstr-spa96.html>

[Lochter et al. 1996] F.-A. Lochter, R. Daessler, P. Morin: Interaktive Exploration. iX 10/96, pp.76-82

[SDSC] San Diego Supercomputing Center: The VRML Repository.
<http://sdsc.edu/vrml/>