

Designing Hypermedia: A Collaborative Activity

Norbert A. Streitz

While approaches exist for designing hypermedia applications with respect to content, structure, and presentation [2], little attention has been paid to the actual process that individual designers incur (see Nanard and Nanard in this issue) or that groups undergo in collaborative design. Large and complex applications usually require a team of content providers, structure and value adding editors, scenario and script writers, graphic, layout and interface designers, among others.

Here, we focus on two aspects of collaboration in a hypermedia design team: support for authors deciding jointly on content, structure and presentation; and group meeting support. The collaborative support we provide derives from investigating the cognitive and social aspects of both distributed cooperative authoring of complex hyperdocuments [4] and the face-to-face staff meetings of a hypermedia newspaper's editorial team [3].

In the case of cooperative authoring, we distinguish three modes of collaboration: individual, loosely coupled and tightly coupled work, with corresponding modes in the SEPIA hypermedia authoring environment [4]. Each mode provides different levels of awareness of co-author activity. In all modes, authors can access and modify concurrently shared hyperdocuments. Authors can assign a division of labor based on SEPIA's decomposition and aggregation structures, reflected in different properties of shared Activity Spaces. Thus, SEPIA employs a hypermedia-based organization model not only for designing the final hyperdocument (in the Rhetorical Space), but at the same time for structuring and relating information as part of the authoring process.

For example, authors discuss goals and issues of a hypermedia document in the Planning Space. They collect, structure and archive material in the Content Space. They develop arguments on the document content, and also capture the design rationale of the final hypermedia product in the Argumentation Space. Authors can work asynchronously or synchronously, distributed in remote locations. The figure shows three authors (see Current Users) working with telepointers in tightly-coupled mode in an argumentation space. They also could establish a video or audio desktop conference (see the Group menu). Thüring et al. (in this issue) further describe SEPIA's presentation interface, in conjunction with the cognitive design principles it supports.

Our second focus concerns adequate computer-based support for group meetings of design teams, in which brainstorming, problem exploration and decision making play a role. Graphic designers, for example, like to communicate their ideas via hand-drawn sketches and annotations on whiteboards. Clients want to see previews, and propose and decide upon changes. Supporting these additional activities requires a wide range of structures [1] from very informal ones such as scribbles to more formal ones such as collections of typed nodes and typed links. Our DOLPHIN system [3] provides this for interactive electronic whiteboards, and for networked desktop and meeting room computers. It is possible to integrate and transform DOLPHIN material into SEPIA and vice versa. (Schnase *et al.* also discusses hypermedia issues for heterogeneous environments.) Designing, producing and delivering hypermedia applications requires both integrating these tools and structures, and incorporating them into a more comprehensive organizational context, such as the workflow procedures of professional publishing environments. ■

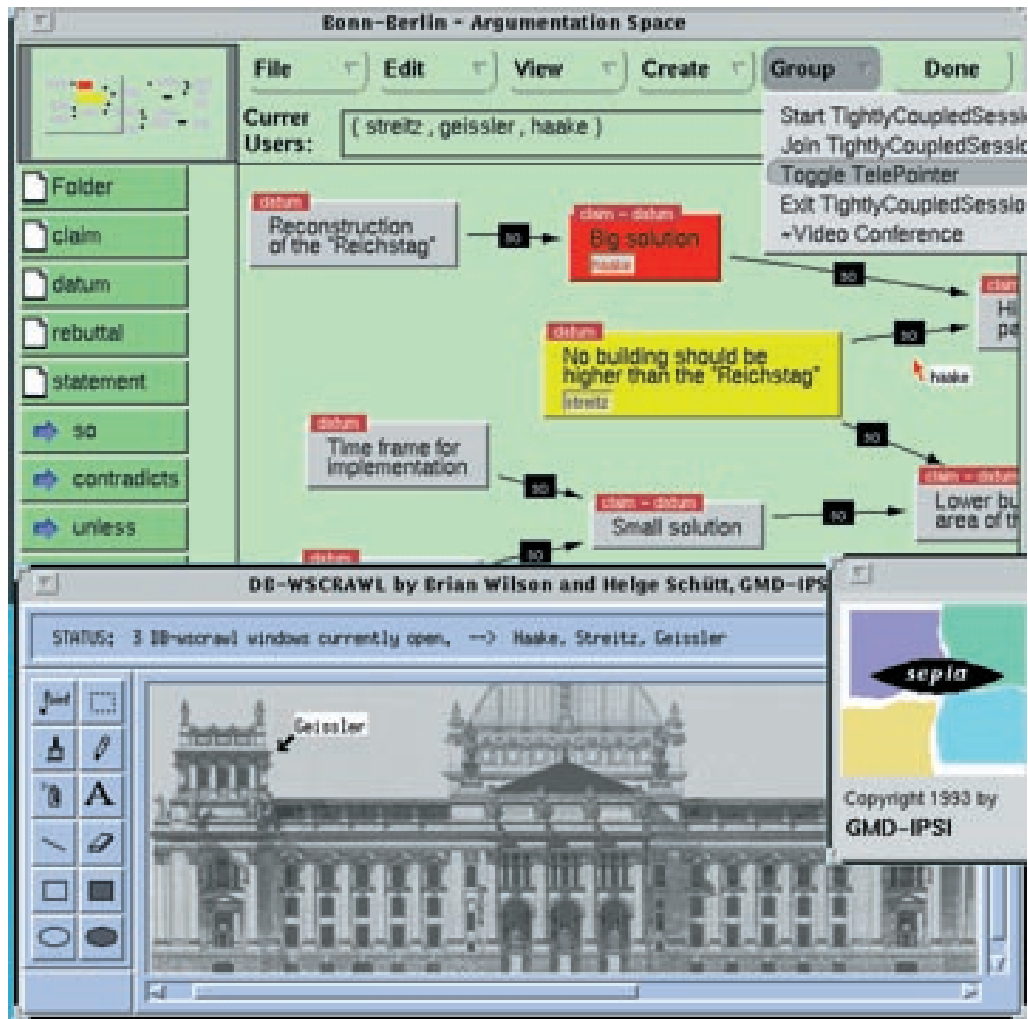


Figure User interface of the cooperative SEPIA hypermedia authoring environment showing three users in direct collaboration at the network and at the node level (lower window).

References

1. Haake, J., Neuwirth, C., Streitz, N. Coexistence and transformation of informal and formal structures: Requirements for more flexible hypermedia systems. *European Conference on Hypermedia Technology'94 Proceedings (ECHT'94)*. (Sept. 1994, Edinburgh), 1-12.
2. Schuler, W., Hannemann, J., Streitz, N. (Eds.) *Designing User Interfaces for Hypermedia*. (1995) Springer, Heidelberg.
3. Streitz, N., Geißler, J., Haake, J., Hol, J. DOLPHIN: Integrated meeting support across LiveBoards, local and remote desktop environments. *Proceedings of the ACM 1994 Conference on Computer-Supported Cooperative Work (CSCW'94)*. (Oct. 1994, Chapel Hill, NC), 345 - 358.
4. Streitz, N., Haake, J., Hannemann, J., Lemke, A., Schuler, W., Schütt, H., Thüning, M. SEPIA: A cooperative hypermedia authoring environment. *Proceedings of the ACM Conference on Hypertext (ECHT'92)* (Nov. 1992, Milan) 11-22.

Norbert Streitz is the deputy director of the Integrated Publication and Information Systems Institute (IPSI) of the German National Research Center for Computer Science (GMD)