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The Role of Librarians in Developing Software: Hypertext

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ISBN

9780871114228

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Publication Date

1994

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8. The Role of Librarians in Developing Software: Hypertext

Information sources available to microcomputer owners have changed the conventional methods of communicating ideas. Incorporating text, graphics, sound, animation, and video images into communications — as is made possible with hypertext — is a remarkable departure from the traditional two-dimensional space of paper-based print media. Traditionally, access to information in a book has been linear, requiring the user to either scan the pages sequentially to discover its contents or to use an index to isolate a starting point. Now, with a combination of information delivery options (text, audio, motion video), access to information contained in prepared materials can be offered in various ways apart from traditional scanning from beginning to end of source. The ability to make connections between concepts and to communicate by combining media make hypertext and hypermedia powerful information delivery instruments. Ideally, hypertext provides easy access to information in a way that matches the way a person thinks. Additionally, in this ideal picture, a hypertext package provides formats and sources to satisfy a variety of needs, including both quick answers and in-depth explorations. The challenge to librarians and information specialists is to find ways to select from the immense potential of information sources and to develop a product that is useful to users.

Vannevar Bush's 1945 *Atlantic Monthly* article "As We May Think" is credited with originating the idea of hypertext. Bush introduced the idea that, with the expansion of information available, "information overload" would become a serious problem. He advocated an effort to create a mechanical device — which he called "Memex" — that would separate information from the physical location of the original and make it available and useful to a user. Also in the 1940's, work was beginning on a necessary component of creating the reality to match Bush's ideal — a computing language that would allow the connection of portions of

programming code to other lines of programming code and also to peripheral devices, such as optical disks and other databases. An early application of the ability to proceed in a nonlinear fashion was for use in computer-based tutorials, where a user can repeat a portion of a lesson until its concepts are mastered.

Bush's broader vision of an interactive linking device for communicating ideas was developed by two researchers, Douglas C. Englebart at the Stanford Research Institute and Theodor Nelson of Xanadu. In 1963 Englebart developed a system he called NLS (ONLine System). NLS contained features that would eventually become part of hypertext, including the use of windows, use of a pointer device (a "mouse"), ability to send messages by electronic mail, and the ability to link and annotate documents in a hypertext-like environment. The term "hypertext" was coined by Theodor Nelson in the 1960s when he used it to describe nonsequential reading and writing that link related passages (or "nodes" or "cards") of text. This innovative approach for addressing programming code was published in *Computer Lib/Dream Machines* in 1974. Developments in computer technology and the introduction of powerful personal microcomputers encouraged exploration of this technique for use on small computer systems. Some hypertext products are purchased as completed programs. More typically, hypertext software is purchased and applications developed by library staff members or others who see a way to enhance a learning experience. Applications include leading students to more information about poets and poetry and giving assistance in finding library locations, and expand considerably beyond this — given the energy and inspiration of would-be creators.

What Does Hypertext Look Like? Some Examples

In a lecture this would be the time to show an actual demonstration of using hypertext software, but since that will not work here, it's time to show some sample screens. The two examples that follow show aids for getting around in a hypertext program.

To help with use of a complex hypertext-system database, a graphical display feature may be included to serve as a "road map," to show the user his or her location in the system and how to escape or continue.

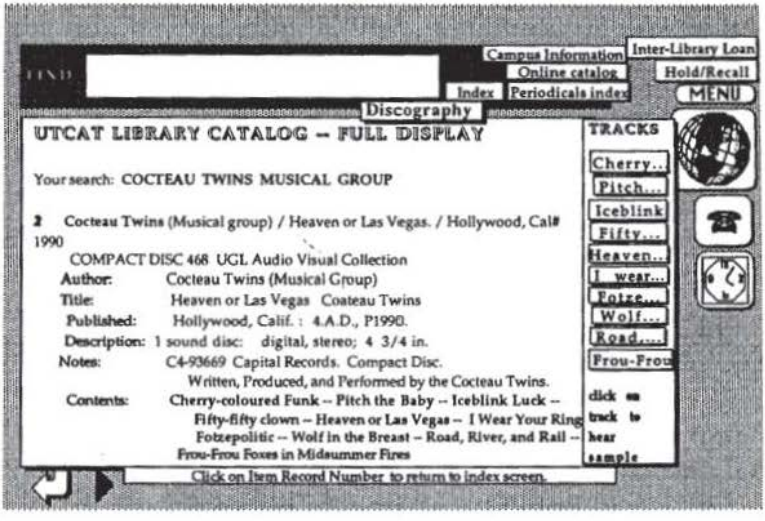


Figure 1. Sample of graphical display with thumbnail-size icons.[1]

The road map may be accomplished in a simple way, such as by showing all the windows displayed in the search in a thumbnail-size picture on one screen. Choosing a displayed icon with the mouse directs the hypertext program to take the user to information in that field.



Figure 2. Sample of graphical display with more complicated relational connections.[2]

More complicated displays for guiding users give the appearance of an actual road map. They show where it is possible to go, functioning like a tour map that gives available routes and landmarks to help the traveler, and even showing the user where he or she is on the map. By choosing

features from the interface, such as the location of a particular library at the University of Texas at Austin, the hypertext system can provide information on location, collection holdings, hours, and historical anecdotes about the history of the library.

Some Software

Although most hypertext systems have a similar basic architecture, they may vary greatly in the amount of information they are designed to manage and deliver. Also, the manner in which users are allowed to browse the information differs from product to product, as do the techniques used in writing the programming code. For example, the introduction in 1987 of Bill Atkinson's HyperCard is credited with giving a substantial boost to the use of hypertext in multimedia applications. HyperCard made it easier for the constructor of a particular application to incorporate media and enhanced the experience of the end user.

The most divergent feature distinguishing hypertext software is the intended audience for the material and the way the presentation interface is written for that audience. Below are four "classes" of hypertext systems as differentiated by target user group:[3]

- Single-user: Guide, HyperCard, SuperCard
- Multi-user: Intermedia, NoteCards
- Corporate: Augment, Carnegie-Mellon's ZOG
- World: Xanadu

(Note: HyperCard® is a registered trademark of the Claris Corporation. SuperCard® is a registered trademark of the Aldus Corporation.)

Recommendations to Librarians

The features of a hypertext system that appeal to librarians and information professionals are those that lead to what everyone wants in a computer-based product — a product that is easy to use and satisfying for those who use it. For hypertext these features include a good user interface, easily used word processing capabilities, well-developed information trails, sharing between systems, capability for simultaneous use by more than one person, maintenance of an audit trail, a hierarchy of link and node classifications, programming characteristics that encourage making improvements, navigational charts of the system, and character-string searching.

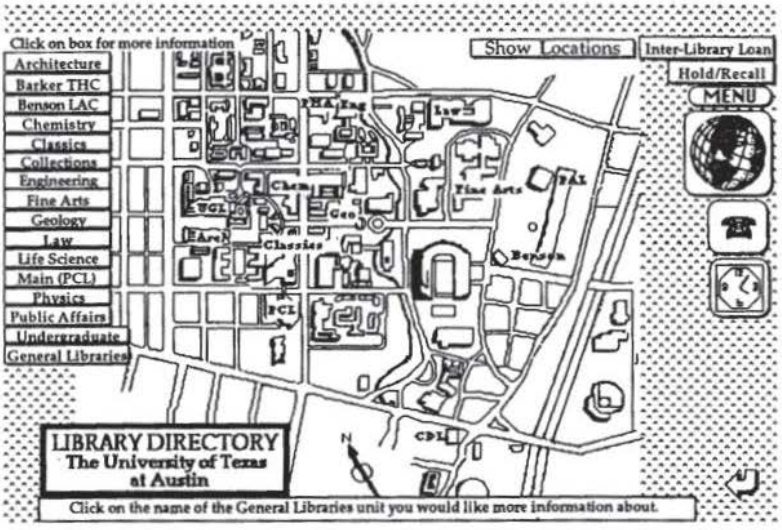


Figure 3. Sample of graphical display with complicated relational connections and with linking to sound sources.[4]

The user interface — the screens of information presented to the user — should be clear and make use of the system seem intuitive. Ideally, the screens will provide a wide flexibility in making choices and allow users to direct their searching. A system should be designed to allow sophisticated users to find the search productive, but also should consider novices' need for a tutorial.

Easily used word processing features allow for modification or annotation of chunks of information and allow users to easily take away information for use elsewhere.

The paths that lead users down information trails should be constructed so that they deliver users where they need to be, while allowing for a variety of access points — rather like designing a building with plenty of doors so that a person coming from any direction can easily get in.

The system should permit copying and sharing of information between users, either on the same system or in different environments, even though the underlying programs may be different for different hypertext applications.

An effective system allows multiple, simultaneous users to access and share the system without inadvertently or maliciously affecting each other's searches.

The hypertext system should provide a history of the actions within a search — similar to an audit trail. This is important for reconstructing a previously used path.

Links to information sites and the information chunks that are located in those sites need a subject heading or brief description of contents to help users make informed decisions about which nodes to open. Also, hierarchically classifying nodes of information — assigning them into levels such as primary, secondary, and tertiary sources — can help keep users from the discouragement that comes with getting bogged down in marginally relevant locations.

The systems should allow for modification or enhancement to better serve the needs of a particular audience. Each hypertext system should ideally contain a tool kit to be used in creating a more highly individualized application of the original.

For more complicated systems, navigational charts are essential. These may appear as graphical interfaces that detail the relationships between major components of a system. Figure 3 is an example of such an interface, allowing user access to text information, motion, and sound (the buttons with song titles are linked to sampled music).

Hypertext systems should allow searching by character string. This is the search strategy most apparent to library users — the phrases and words they think of when describing the subject of interest. An added feature may be a thesaurus that checks for related terms, but the user should be helped and not hindered by the feature.

Limitations and Optimism

While relational paths to information sites can make searching easier, time and effort are required by the librarian to identify and create this linkage. Because multiple paths are available and can become confusing, users of hypertext can suffer disorientation in their searching. Librarians need to go into hypertext projects with a realistic view of what will be required of them and, to help new users, plan to provide tutorial programs and navigational guides. And, no matter how well designed the hypercard product, users will still be required to make judgments about the usefulness of the information retrieved in a search.

This kind of realistic thinking, however, should not detract from the potential and promise of hypertext. As noted earlier, at their best hypertext products match a user's thought processes and make locating information easier; they can enhance learning. The challenge for librarians continues (as it does in other areas of their work) to select the best and make it as useful as possible for the library's clientele.

NOTES:

1. Mitchell Brown, Hypercard card entry in "U.S. Patent Tutorial," using Hypercard 2.0 (Santa Clara, CA: Claris Corp.), 1992. (unpublished)

2. Mitchell Brown, Hypercard entry in "UTCAT Emulation," using Hypercard 2.0 (Santa Clara, CA: Claris Corp.), 1992. (unpublished)

3. Ching-Chih Chen, *Hypersource on Multimedia/Hypermedia Technologies*. (Chicago: Library and Information Technology Association, American Library Association), 1989, p. 4.

4. Mitchell Brown, Hypercard card entry in "UTCAT Emulation," using HyperCard 2.0 (Santa Clara, CA: Claris Corp.), 1992. (unpublished)

LIBRARY WITHOUT WALLS



COMPILED BY
SUSAN B. ARDIS

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