

An Animated Direct-Manipulation Interface to Digital Library Services

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ABSTRACT

The Digital Library Integrated Task Environment (DLITE) is a novel user interface concept for distributed document collections and services. It is an interaction prototype, not a polished graphical user interface, and is a front end to an evolving variety of distributed document services. DLITE is part of the Stanford University Digital Libraries research project. This videotape explains the principles of the DLITE design and shows the current implementation in action.

Keywords: Digital library, user interface, direct-manipulation, World Wide Web, holophrasing

THE STANFORD DIGITAL LIBRARIES PROJECT

The Stanford Digital Libraries Project does research within the Stanford University Computer Science Department in conjunction with industrial affiliates such as Xerox PARC. The Digital Libraries project is not about scanning millions of documents. It is concerned with access to widely distributed digital documents, library services beyond simply acquiring documents, and system architecture that affords uniform use of distributed document services.

WHAT IS DLITE?

DLITE is a novel user interface concept for distributed document collections and services. DLITE uses direct-manipulation, drag-and-drop, and object animation to create a close connection among users and documents. DLITE also uses the Netscape web browser for some user interactions and for presentation of results. The underlying software architecture and implementation are provided by the Stanford University InfoBus research prototype.

WORKCENTERS: A SEARCH TASK

Users use and may create workcenters consisting of a set of objects, called components, needed for a particular task. Components represent capabilities for high-level

operations. The video shows an example workcenter containing a Query Creator component and several Search components. We can type a search string into the Query component and invoke it. The component emits a Query Object, an iconic representation of the query. When the query is dragged and dropped onto a Search component, that Search Service (say, AltaVista web search) is invoked on the Query. The Search Component emits a Document Collection object. The Document Collection fills with small document icons as the results of the search are received. The video shows how the result set can be abstracted, the abstract viewed, and how selected elements of the collection can be displayed.

INTERFACE ANIMATION

We next show how DLITE uses direct-manipulation, drag-and-drop, and object animation. A query dropped on a Search Service moves to "join" the query result object emitted by the service. Any document in a collection can be "copied off" by dragging a copy of its icon out of the collection. Animation is also used as a progress indicator. When we drop a scanned text document onto a text recognition service, the document animates downward when it is accepted by the service. Successful recognition results in the document and its new recognized text document sliding to the right. Failure is indicated by the document sliding left. Finally, when an object is dropped onto a component that cannot process that object type; the object scurries back to where it came from.

A COMPLEX TASK: A CONFERENCE PAPER BIBLIOGRAPHY

We next perform a more complex task: compiling and formatting the reference section for a conference paper (Fig. 1). To cite the Stanford Digital Libraries home page, we create a query for the Digital Libraries Project, then drag-and-drop it onto the AltaVista search component. Numerous hits are returned, and we find the home page among the first few hits.

The second citation is to a published paper whose title and author we know. We create a more specific "bibliographic" query, and drop it on the Folio document abstract service. The desired abstract quickly appears.

After similarly finding the remaining paper citations, we have the results of interest, in separate document collections, but we want a nicely formatted bibliography. So we turn to InterBib, a bibliography processing service. We create an empty document collection object, then drag copies of our found cited documents into it. When we drop that collection on the InterBib service, it emits a bibliography nearly ready for insertion into our paper.

HOLOPHRASTING

It is clear that DLITE is not a walk-up-and-use interface. We are experimenting with progressive disclosure, or holophrastic, component sets that can guide a user through a particular task. We show a sketch of components that could guide a walk-up user through a simple task. As each step is clicked on, it expands to provide detailed instructions, which can later be collapsed by the user as the task progresses.

NOTICE

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REFERENCES

1. Cousins, S., et. al. A Distributed Interface for the Digital Library. Stanford University, 1996. <http://www-diglib.stanford.edu/cgi-bin/WP/get/SIDL-WP-1996-0037>.
2. Paepcke, A., et. al. Towards Interoperability in Digital Libraries: Overview and Selected Highlights of the Stanford Digital Library Project. IEEE Computer Magazine, May, 1996. Also: <http://www-diglib.stanford.edu/cgi-bin/WP/get/SIDL-WP-1995-0013>
3. Paepcke, A. InterBib: Bibliography-related services. <http://www-interbib.stanford.edu/~testbed/interbib>.

FOR MORE INFORMATION:

<http://www-diglib.stanford.edu/>
<http://www.parc.xerox.com/istl/projects/dlib/>

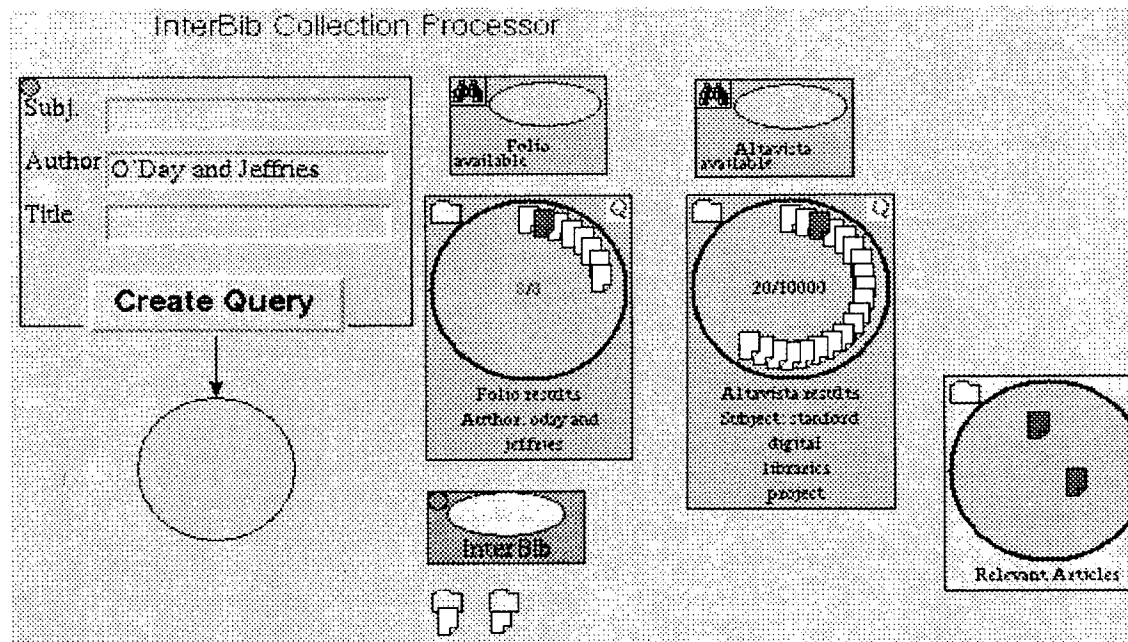


Figure 1: A DLITE workcenter for bibliography processing. The workcenter shown contains seven main components: a query constructor, two search services, two search result collections, an ad hoc collection called

"Relevant Articles," and the InterBib service. Below the InterBib service are two collections that have already been processed, each with the generated bibliography as a document next to it.