Daffodil - Strategic Support for User-Oriented Access to Heterogeneous Digital Libraries

Claus-Peter Klas, Norbert Fuhr, Sascha Kriewel, André Schaefer
University of Duisburg-Essen, Germany
{klas,fuhr,kriewel,schaefer}@is.informatik.uni-duisburg.de

January 22, 2006

1 Introduction

DAFFODIL is a frontend system for federated digital libraries aiming at strategic support for information access. The system provides a graphical user interface, depicted in Figure 1 which offers a set of tools (which can easily be extended) for retrieving, organizing and annotating digital library objects; in addition collaboration among users is supported.

The system connects sets of DLs and Web-based services, integrates and enhances their content and functionaliy by means of specific tools and presents the result as a powerful virtual DL to the user. The current prototype integrates 15 resources from the area of computer science.

2 Searching with Daffodil

DAFFODIL combines browsing and searching strategies in a natural way. Based on empirical observations of the information seeking behaviour of experienced library users, the system offers a number of successful tactics for the information search, which are implemented in a variety of tool described in the following.

The search tool The search tool provides a form-based interface for formulating queries to the federated DLs in a uniform way, and presents merged results in a homogeneous way for viewing and navigation. Unintrusive icons are used to mark documents that have previously been seen, stored or that have been interacted with in other ways.

Personal library All DL objects, such as queries, results, fulltexts, terms, authors, conferences or journals can be stored in the personal library, where they are saved for accessing them beyond the context of the current search. With personal folders users can structure their results, and can build a personal archive of interesting documents and other objects. Group folders with the possibility for annotations on any object, including previous annotations, provide support for collaborative work. Based on the personal folders of a user, the system provides awareness and recommendations.
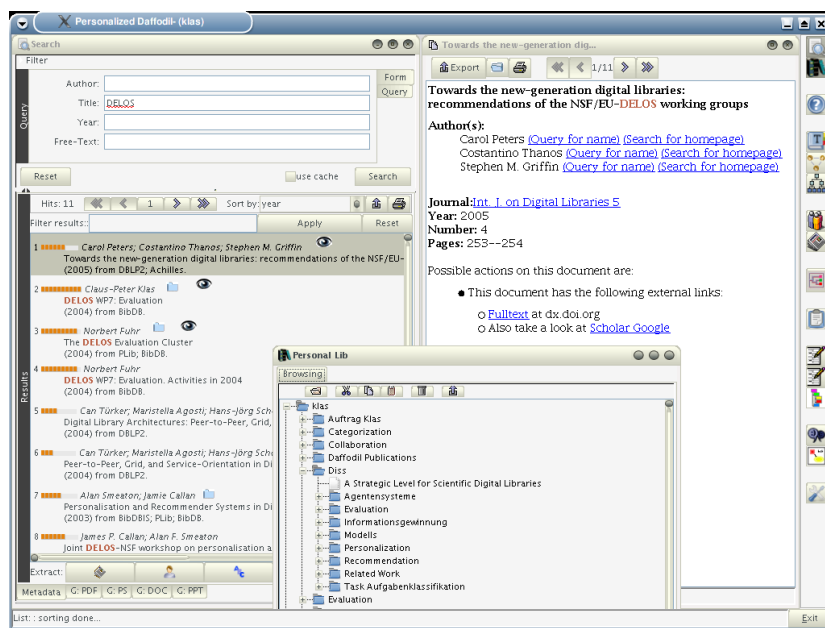
Figure 1: The DAFFODIL desktop: result list (left), personal library (center), and detail view of a document.

Active Tools A number of tools provide active support during the search, e.g., for the formulation of queries. They provide tactical help for improving a query with the goal of getting more or more exact hits. The *'Did you mean?'* tool analyses the search terms used in a query, and suggests alternative (or corrected) spellings. Other tools find synonyms or related terms for a given query, where *related terms* means those terms that often appear in the same context within documents as the search terms.

3   Strategic Support

While commonly available search systems often supply only simple and very basic search operations, DAFFODIL tries to enable non-experts in searching effectively by tight integration of high-level search functions, some of which are described in the following.

References and Citations With the reference tool it is possible to find referencing or referenced documents for an existing document. The tool can be activated intuitively by dragging and dropping a document from other tools.

Journals and Conferences For browsing and searching in journal volumes and conference proceedings the journal and conference tools are available. Users can filter by titles of scientific journals or conferences availiable, to browse within the results – often with direct access to the metadata on articles or even links to fulltexts. In other cases, the link to the online journal is provided.
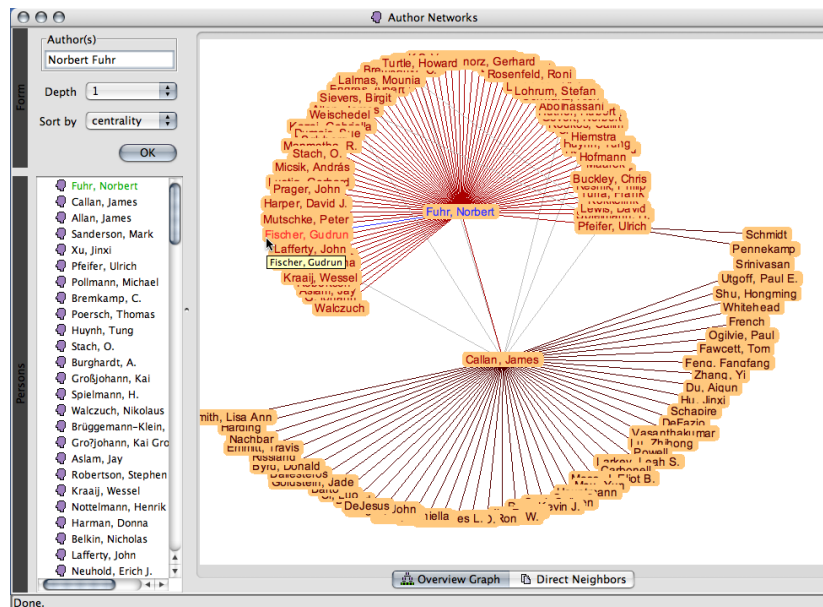
Figure 2: Author networks: browser and visualisation

Author Networks   Starting from an author whose relevance to the search interest is known, it is possible to search for further publications by this author, or to exploit the co-author relationships of the author for deriving a collaboration network.

In such a social network, which can also be visualised in a relationship graph (see Figure 2) it is easy for the user to identify central authors and to find authors who often publish together.

Classifications and Thesauri   These tools provide users with access to classifications and/or thesauri of the subject domain.

4   Conclusion

A three phase, qualitative evaluation (presented at ECDL 2004) with 28 participants of differing search experience supported the underlying model and fulfilled the expectations in the system. Due to the tight integration of high-level search functionalities through the graphical tools, DAFFODIL makes efficient and effective searching possible. The concept of strategic support is realized at all levels of the system; the personal library supports personalization and group work. A user is enabled by DAFFODIL to apply complex search strategies in a natural manner. The presentation of search results by DAFFODIL eases the cognitive load of interpreting the information.

The prototype is freely available at `http://www.daffodil.de`.