

AQUA: An advanced user interface for the Dienst digital library system

László Kovács, András Micsik, Balázs Pataki

MTA SZTAKI

Computer and Automation Research Institute
of the Hungarian Academy of Sciences
Department of Distributed Systems
H-1111 Budapest XI. Lágymányosi u. 11. Hungary
{laszlo.kovacs, micsik, pataki}@sztaki.hu

Abstract

Dienst system is widely used for providing distributed digital library services. A new user interface for Dienst has been built as part of the AQUA project to enhance the capabilities of presently available Dienst user interfaces. This new interface is presented, and its features for interactive content exploration are described.

1 Introduction

Digital libraries are a promising and also highly required new type of network services. In the area of computer science both USA and Europe make a significant effort for creating a distributed digital library service. The American service is called Networked Computer Science Technical Reports Library (NCSTRL) [4], while the European one is the ERCIM Technical Reference Digital Library [5]. Currently these services offer more than 20,000 technical reports for the research community from more than 60 institutions, and it is constantly growing.

The underlying software is in both cases the Dienst distributed digital library system [3]. The system is accessible through any standard WWW browser, and offers searching, browsing and downloading functionality in a transparent way for the distributed document repositories. Repositories are managed by the publishing institutions themselves. SZTAKI has been serving as a regional center for the joint NCSTRL-ETRD L service since 1996 [2]. The Department of Distributed Systems (in charge of Dienst issues within SZTAKI) has built a prototype of a new user interface for the NCSTRL-ETRD L service which is introduced in this paper.

2 User interfaces for Dienst

Currently there exist several user interfaces for the Dienst system, including an interface for library users, and an interface for librarians. Both interfaces operate as a form-based WWW service. The interface for library users has several flavours: one for the ETRDL, and two different versions for NCSTRL. These interfaces offer *searching* by different fields such as author, title or abstract (ETRD L can also search for keyword and language fields), *browsing* by year of publication or by author name, and *document views* in several formats. However the basic user interaction method is the same in all these interfaces: the user formulates a query, gets a list of documents as result, and downloads documents in the list one at a time.

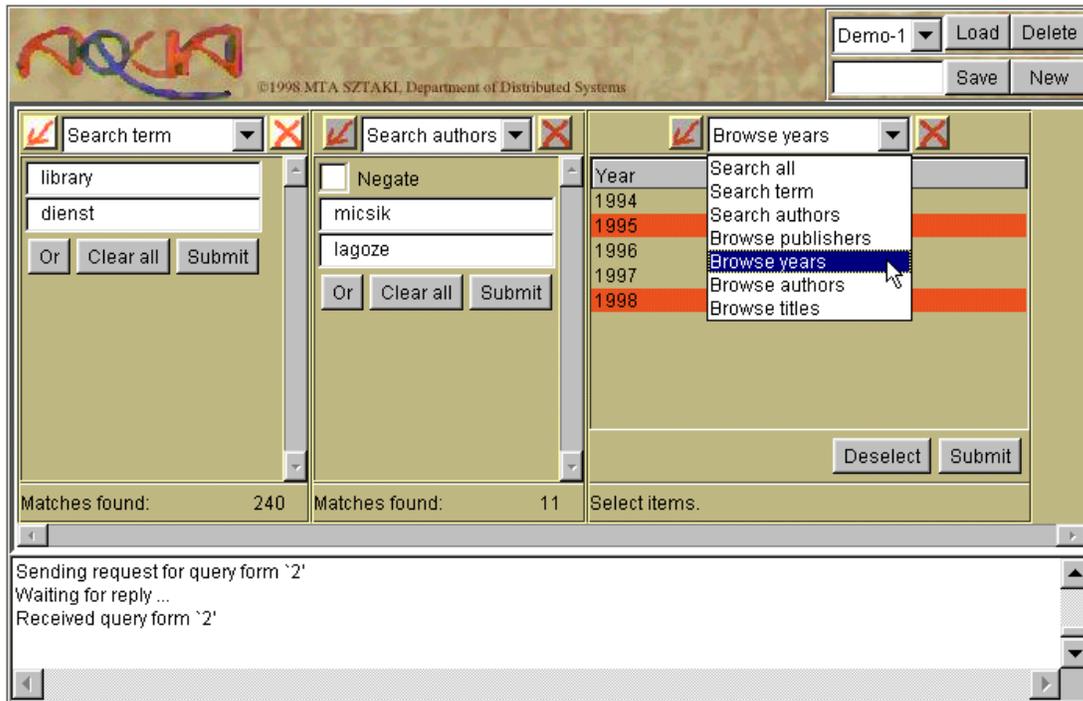


Figure 1: First part of example query

Searching and browsing functionality is totally separated, and the only way for refining a query is to return to the previous query formula, change and reapply it.

3 The new AQUA user interface for Dienst

AQUA stands for Advanced Query User Interface Architecture [1], and its main goal is to provide a generic, powerful and easily usable interface for digital libraries and Internet search engines. Currently AQUA has been applied to the functionality of the Dienst digital library system.

In this user interface a compound query expression is visualized as a series of panels in the middle part of the window (Fig. 1). Each panel represents one piece of the query expression, and performs that expression on the output result of the previous panel. In the example in Fig. 1 the first panel contains a search for terms "library" or "dienst", and this query has 240 documents as result. The second panel refines the first query by searching only for authors "Lagoze" or "Micsik" within that 240 documents, and the 11 documents found are browsed by publication year in the third panel. The example continues on Fig. 2 where the remaining document titles are listed after selecting years 1995 and 1998. Finally in the last panel a selected document is shown. The document view contains part of the bibliography record and a download menu, where the document can be downloaded in the selected format. At this point the user can choose to return to the document view of the original Dienst user interface as well.

Panels in the list form a so called query chain. The user can freely modify, grow or shrink this query chain. After every modification panels are updated according to the user's changes, and the actual results of the query chain are visualized for the user. Through this process the user can interactively explore the contents of the digital library. These query chains can be saved and later reused. Each user can have individual preferences, and an own set of saved query chains. Manipulation of query chains can be done in the upper right corner of the

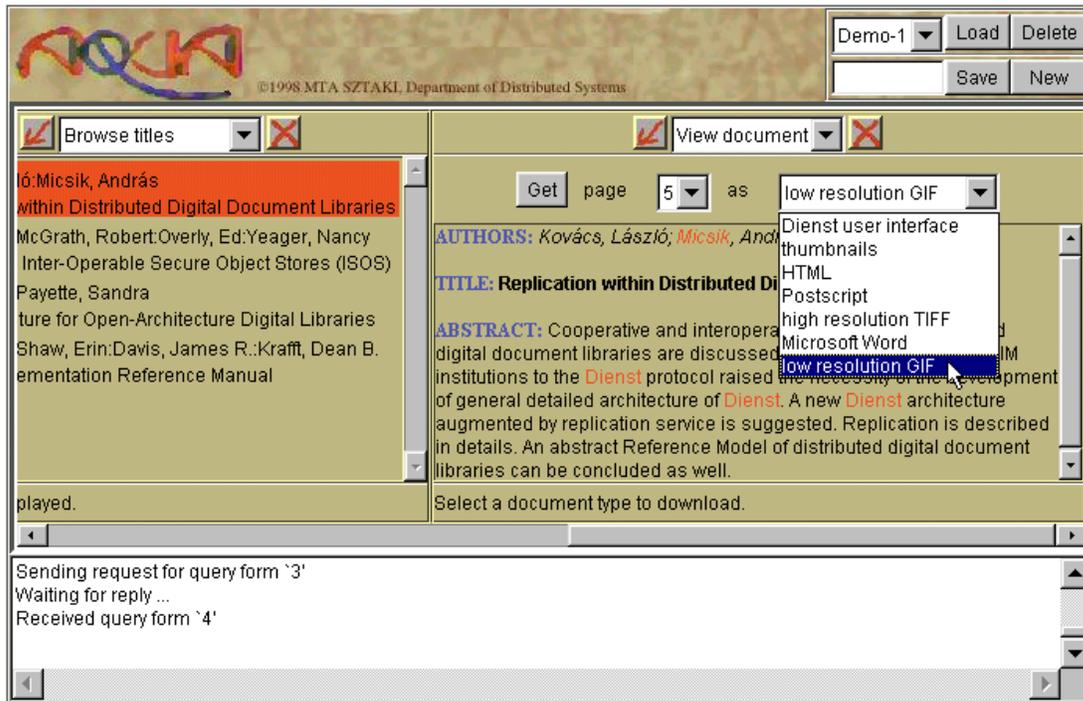


Figure 2: Second part of example query

window. The lower part of the window is a kind of console, where running processes can be tracked, and where errors are printed.

4 Implementation issues

This AQUA interface is implemented as a Java applet and a server (also written in Java). We followed the "thin client – fat server" principle, which gave us several advantages. The main advantage is that the client applet is more robust, because it needs less memory, and thus it can put stress on the quality of visualization instead of information retrieval and processing.

The server contains the following parts:

- *Wrappers* connect different digital library services to the AQUA server. This means that several digital library or database services can be accessed through AQUA at the same time, even using different query languages or protocols. Both session-oriented and sessionless services may be connected to the AQUA server.
- *Metadata* describing the properties of connected digital library services.
- *User database* containing the users' preferences and saved queries.
- *Query chain manager* translates user actions into actual queries for the digital library services, and generally cares for the consistency of the query chain visualization.

The current implementation relies on the functionality of the freewais-sf software as indexer service for the Dienst system. In order to shorten response times the AQUA server directly addresses queries to the freewais-sf search engine.

5 Summary

The new AQUA user interface for Dienst provides all the searching, browsing and document viewing functionality that is present in the traditional Dienst user interfaces, but integrates these functionalities into a new user interface paradigm. This paradigm is based on the use of query chains.

Further work will be done to enhance the comfort of the user by adding more possibilities for personalization and introducing an automatic notification service.

References

- [1] AQUA project homepage, URL: <http://www.sztaki.hu/sztaki/aszi/dsd/aqua/>
- [2] Dienst server at SZTAKI, URL: <http://www.sztaki.hu/dienst/>
- [3] C. Lagoze, J. R. Davis: "Dienst: an Architecture for Distributed Document Libraries", Communications of the ACM, 38 (4) April 1995
- [4] Networked Computer Science Technical Reports Library (NCSTRL), URL: <http://www.ncstrl.org>
- [5] S. Biagioni, J. Borbinha, R. Ferber, P. Hansen, S. Kapidakis, L. Kovács, F. Roos, A. M. Vercoustre: "The ERCIM Technical Reference Digital Library", ECDL'98, Heraklion, Greece, September 1998
- [6] L. Kovács, A. Micsik: "Replication within Distributed Digital Document Libraries", Proceedings of the 8th ERCIM Database Research Group Workshop on Database Issues and Infrastructure in Cooperative Information Systems, Trondheim, Norway, 1995