

# A study on the user interface design for TEL, and on additional user services

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## Background

The European Library ([www.theeuropeanlibrary.org](http://www.theeuropeanlibrary.org)) is a Web portal that offers access to different resources of 45 national libraries of Europe. This portal has its origin in the TEL project, whose aim was to investigate the feasibility of establishing a new service to give access to the combined resources of the national libraries of Europe. The European Library service is aimed at informed citizens world wide (both professional and non-professional) who want a powerful and simple way of finding library materials. Moreover, it is expected to attract researchers, as there is a vast virtual collection of material from all disciplines. It offers anyone with an interest a simple route to access European cultural resources.

In late 2005 and early 2006, TEL and DELOS jointly reviewed and discussed, from a technological point of view, topics of interest to a future European Digital Library, and investigated subjects for a more strict cooperation. Among the positive actions that have been jointly undertaken, there is the initiative to study the overall design of the TEL user interface, as well as the exploration of additional services, especially for supporting query formulation, collection navigation and results visualization.

## Objectives of the Study

The activities in the short-medium term are focusing on five topics. The main objective is to understand which functions (or services) are more useful in the TEL environment, in order to motivate the end users to explore more large datasets and have "more fun" while exploring TEL. Also expert users like librarians would use some of those services to better visualize (and understand) the existing collections, the results produced by queries and navigation services, and thus be able to define in an easier way customized views for end users.

*Evaluation of the present interface.* The starting point is a comparative evaluation between the current TEL interface and an appropriate variant of Daffodil ([www.daffodil.de](http://www.daffodil.de)), which is an interface to Digital Library functionality developed at the University of Duisburg-Essen. This evaluation will follow both an analytical and an empirical approach. The goal of the analytical evaluation is to assess the functional similarities and differences between the two systems. The goal of the empirical evaluation is to evaluate how well each tool supports the users needs.

The analytical evaluation will consider the usability, functions for search, browsing and result display, and the feedback/help functions of both. For this purpose, the methodology and the questionnaires developed by DELOS will be used. The empirical evaluation will be based on a user-centered and qualitative approach. Its focus is on the users' experience with the tools, considering user characteristics, preferences and strategies, the types of activities/tasks users perform, and the environment in which the search tool is used. The evaluation must take into consideration the current necessary portal nature of the site.

*Support for query formulation.* The Daffodil interface already provides functions that help the user in formulating better queries. Most basic, a built-in spell checker will flag search terms not contained in the dictionary, and will propose correct variants. For advanced query formulations, a syntax checker will point out syntactically incorrect formulations. Finally, there is a 'related term' tool that proposes (statistically) similar terms for any of the query terms entered. The comparative evaluation will show to what extent these tools are useful for the TEL users, and then possible integration into the TEL system will be evaluated.

*Virtual collections and navigation.* It is planned to provide and test an add-on service for building virtual digital collections starting from a set of real ones. For the definition of the virtual collections, the service should distinguish between expert users (like technicians and librarians) and end users. The service relies on automatic batch techniques of indexing, clustering, and classification of existing collections, allowing a visual navigation of their content, for an easier definition of the virtual collections. One of the tools to be tested is SOMLib,

developed at the Technical University of Vienna, which is based on the self-organizing map (SOM), a popular unsupervised neural network, used to organize documents by content into topical clusters. Metaphor graphics facilitate the intuitive representation of the resulting document archive, allowing users to get an instant overview of its content and characteristics. The benefits expected are that the users can be presented with cross collection views, can deal with smaller set of more relevant data and therefore queries can be processed in a faster way.

*Presentation/visualization of results.* The Daffodil system already provides functions for relevance ranking or quick filtering of results, as well as extracting attributes like author names or frequent terms from the result set. In addition, it is planned to provide and test an add-on service that allows end users to interact with the query result in a more effective way. Several techniques can be used in this context: real time indexing, cluster-gather algorithms, smart use of relevance factor, information visualization techniques. One of the tools to be tested is DARE (Drawing Adequate Representation, developed at the University of Roma1), which is a visualization tool allowing the user to analyze large amounts of data. An innovative feature of the system is that it supports at the same time disaggregate and aggregate (OLAP) data visualizations, allowing the user to move seamlessly between them. Moreover, the system incorporates a knowledge base that automatically produces the best visual data representation for a given data set, avoiding the end user to deal with this time consuming and error prone activity.

*Annotation.* Annotations support the idea of collaborative search and enrichment of the Digital Library, as more and more users want to participate and share information, acting also as contributors rather than just as simple readers. The three main functions to support this notion are: (i) adding information related to documents or to query results; (ii) categorizing, cataloguing and linking resources; (iii) adding new content and discussing others' contributions. This activity will be based on two tools (MADCOW, developed at the University of Roma1, and FAST, developed at the University of Padua). In the first step there will be the possibility to annotate one record or a result set, and to show all annotations available for that record or for a result set. In a second step it will be possible to make queries also on the contents of the annotations and to annotate different parts of records (tags, multimedia objects, upload/attach media objects).