

First steps in designing an adaptive Web-based IR System

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Abstract: In recent years, computer based repositories are becoming larger and more diverse thanks to the diffusion of technologies such as the Internet and the World Wide Web. In this context one of the most common problems people have when using the net is finding specific information (Bernard, Chaparro, 2000). It is clear that the complexity and the amount of data requires an adaptation of the tools which support information searching processes to the requirements of their users. This paper deals with the OMERO project (national research project n.41902). The project aims at designing, developing and testing the interface of Omero system in order to support effective and intelligent information searching processes.

1. INTRODUCTION

The Emilia Romagna region represents one of the major clothing and textile industrial districts in Italy. For this reason a regional service centre (CITER) was created in 1980 offering standard information about clothing and textile market trend and development. Recently the growth of the strategic role of information in business practices highlighted the need for a more flexible and faster support to the decision making activity. This led to the identification of web based search systems as a possible solution and to the implementation of Omero project.

The main purpose of OMERO is to support working people with different roles in the field of textile and clothing industry, making them able to retrieve, modify, and share useful information. The core system is composed by an expert system with a large knowledge base managed by an ontological conceptual network. The identification of a relevant node or an area of nodes brings the system to present an editable dossier of text documents, charts, images, which are related to the search space identified (Chesi, Rizzo, 2000).

The most relevant aspects of the project reside in the adaptation to the specific user's information needs, which presents a selective view of the knowledge tree and of the search graph useful to retrieve and share the relevant expert information inside OMERO.

1.1 Adaptive approach used in OMERO

To satisfy heterogeneous needs and to support an efficient interaction with Omero interface system we have chosen an adaptive design approach based on User Centred Design (Norman 1988, 1993) guidelines. In our approach adaptability is considered the key characteristic (Shneiderman 1992) of computer technology that allows information seeker to use the electronic environment in a way that support human strategies and tactics of information seeking and retrieval (Marchionini, 1995). The UCD approach consists of four principal phases: definition of user requirement, prototyping, design and evaluation. Currently we are engaged in the second step.

The first strategy that we have applied to design our information retrieval interface system has been the analysis (by interviews, real work context observations, information system analysis of CITER's employees and work activities) of information flow, observing the behaviour of people in the real problem-solving context in which their information needs are created. This technique of inquiry helped us to outline some general guidelines for user requirements. The main result we have obtained from this phase is that CITER's users can be

divided into two groups: users that know what information they need and users that do not know what they are searching for. In the first case users activity can be described as an information retrieval process based on analytical strategies. In the second case information seeking becomes a problem solving activity (Rumiati, 1990) based on browsing strategies. This second case can be briefly described as follows: the first step is characterised for general awareness of the knowledge of problem domain. In addition the user often shows that he is not fully aware of his goal. In this phase, a human operator helps the client to understand his problem through a question and answer process that supports the identification of possible information source required satisfying the user's need. The human operator knowledge can make available a better possible solution for typical problems (i.e. information about spring-summer trend for women), contingent problems (i.e. I need information's about behaviour and performance of competitors) or with identification of obscure problems (i.e. how can I improve in my field?).

1.2 Conclusion

In order to address the adaptability of the system the first prototype has been based on navigation categories process in order to support both navigation style (analytical and browsing strategies). For this purpose some analysts have listed eight knowledge categories related to the searching process in the textile and clothing industry: planning and strategic control; design, development and research; administration and finance; provisioning; logistics; production; marketing; human resources. By using an initial enquiry we noticed that the user search strategy through these previous categories is chaotic and non-sequential and unable to support a clear process of information seeking. Currently we are engaged in the development of a second prototype based on direct manipulation of Omero's knowledge tree. From this standpoint the possibilities to support users in identification of information needs are improved using, in addition to the direct manipulation of categories and a natural language understanding approach, an iterative dialogue starting up from a specific user profile (Fleming, Cohen, 1999), mapping the user's knowledge with that of expert system.

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