Chapter 1

Designing to Change Users' Information Seeking Behaviour:
A Case Study

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Abstract

Hypermedia systems allow information to be created, stored, accessed, and manipulated in a variety of ways. One example of such a system is a digital library (DL). DLs are typically difficult to learn and to use. One aspect of learnability is that novice users should be able to learn how to search effectively; one approach to this is having the system provide context-relevant help. We report on two studies: the first identifies novices' difficulties, which informed design changes to integrate adaptive help into a DL system; the second illustrates how interface design can influence users' information seeking behaviour. It focuses on strategies developed and applied by users in response to two types of 'tips'. This study provides an indication of how the interface can improve inexperienced users' interactions with DLs and help them develop more sophisticated information seeking strategies, while also creating more adaptive DLs.

Introduction

As digital libraries (DLs) become widely available and offer their users an extensive repository of information that can be stored and accessed, the issue of how to provide easy and quick information searching is becoming a key consideration (Borgman, 2000; Koenemann & Belkin, 1996; Shneiderman, Byrd, & Croft, 1997).

Increasingly, attention has focused on understanding how people interact with information in digital environments (Beaulieu, 2000; Blandford, Stelmaszewska, & Bryan-Kinns, 2001; Stelmaszewska & Blandford, 2002), and what information seeking strategies users apply when looking for information (Ellis, Cox, & Hall, 1993; Ellis & Haugan, 1997; Marchionini, 1995). Relatively little attention has been paid to how DLs can adapt to users' behaviour, or — conversely — how their design might encourage users to adapt their information seeking. In the following sections, we discuss the need for adaptive user interfaces in hypermedia systems, identify problems that DLs pose for their users, and present an overview of information seeking models that informed our study.

The Need for Adaptive User Interfaces

User interfaces are not traditionally designed to tailor their responses to individual users, being generally 'one size fits all' (Rogers & Iba, 2000). These inflexible interfaces do not reflect users' diversity: that users have different interests, goals, levels of experience, and learning styles, and work in different contexts of use. Consequently, user interfaces pose many problems — notably for users of digital libraries (Bates, 1990; Blandford et al., 2001).

The basic premise underlying adaptive user interfaces is that information presentation should adapt to perceived user needs in the current context of use. In many cases, adaptation is achieved by maintaining an explicit user model that is used to guide the adaptation. This may be a representation of the intended user properties, or of the properties (knowledge, skill level, etc.) of the current user. In other cases — such as those discussed below — the user model is implicit; what is made explicit is what features the interaction should have: the system adapts to surface features of the interaction, such as the quality of the search results.

Adaptive interfaces aim at improving human-computer interaction through interventions that assist users in achieving their goals (Hook et al., 1996; Langley, 1999; Ross, 2000) and ameliorate the efficiency of the system. In the case of DLs, this is important because they are difficult for novices to learn to work with.

Various adaptive user interfaces have been developed, embodying a content-based or social (or collaborative) approach. The content-based approach employs a set of descriptors of objects (usually words within a document) and uses these descriptors as predictive features when recommending documents to the user. This method is used by most search engines (Langley, 1999). In contrast, the collaborative approach 'makes predictions about items based on feedback from many different users' (Langley, 1999). Examples of adaptive user interfaces include systems that recommend: Web pages on topics that a user may find interesting (Pazzani, Muramatsu, & Billsus,1996); movies a

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