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ITB9266

Chapter I

Navigational Tools in Hypertext Information Retrieval Frames and an Expandable Table of Contents

Rawiwan Tenissara
Information Systems Education Center,
National Institute of Development Administration, Thailand

ABSTRACT

Difficulties with navigation are common in hypertext documents. Many studies have examined techniques and design strategies to find the proper structure of a hyperdocument whereas others have investigated navigational tools such as overview diagrams, maps, menus, and/or tables of contents that help users navigate through complex hyperdocuments. This study has investigated the effects of table of contents and frames as user interface on user performance and user satisfaction. The result suggests several guidelines for designing complex hypertext information retrieval systems and creating on-line documentation.

INTRODUCTION

Hypertext systems have found various practical applications that can range from on-line documentation, information retrieval systems, to sophisticated learning environments. These applications fall into four general classes: browsing systems, problem exploration tools, macro-library systems, and general hypertext systems (Conklin, 1987).

Hypertext systems, compared to traditional information retrieval systems, provide users with an easy and flexible access to a large amount of information. Hypertext proponents claim that the most salient advantages of these systems are the modularity of information and non-linear access to information through linking (Mohages, 1992).

The primary method for navigating through a hyperdocument is by browsing. However, the limitations of the browsing paradigm were soon revealed when it deals with large hypertext systems. The well-known problems of disorientation and cognitive overload in hypertext systems have been frequently reported and discussed in hypertext literature (Chen & Stanney, 1999; Conklin, 1987; Halasz, 1988; Nielsen, 1996; William, Eveland & Dunwoody, 2001). Marchionini (1988) states that the problem of disorientation will likely to diminish as the user gain experience with the system and as the designers apply common-sense interface designs. Consequently, designers must not only consider how to structure knowledge from a system performance standpoint, but must also consider what views and corresponding navigational tools are provided to the users.

Providing visual tools, such as overview diagrams or maps, is usually considered an efficient way of helping users navigate through complex hypertext structures (Halasz, Moran, & Trigg, 1987; Yankelovich, Meyrowitz & Druncker, 1988). However, as noted by many hypertext authors (Bernstein, Garzotto, Paoloni & Schwab, 1991), designing good overview diagrams for complex structures has proved to be difficult. Overview diagrams may facilitate navigation well in small hypertext systems, but for large systems, overview diagrams might introduce navigational problems of their own (Nielsen, 1990).

Hypertext usage depends on the mental models users have for the system. These mental models, in turn, depend on the conceptual model used by designers to create the system. The system views and navigational tools will be assimilated into a mental model for a system if they are familiar (Marchionini & Shneiderman, 1988). Therefore, designers must know how users seek information in traditional print systems and in the existing electric systems if they are to produce effective interfaces for new systems.

Many readers of books make extensive use of the table of contents and indexes to navigate through a book. They may transfer this experience to using hypertext systems. Table of contents (TOC) shows how the content of a book is related to its structure and provides the terminology of the book grouped in the context of its use (Jacques, Nonnecke, Preece & McKerlie, 1993). Table of contents is a valuable tool