Towards Modelling

Web Search Behaviour:

Integrating Users’ Cognitive Styles

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Master of Information Technology (MInfoTech) QUT, 2005

A thesis submitted in fulfilment of the requirements for the degree of

Doctor of Philosophy (PhD) in Information Systems

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Brisbane Australia
February 2013
Abstract

With the rapid growth of information on the Web, the study of information searching has led to an increased interest. Information behaviour (IB) researchers and information systems (IS) developers are continuously exploring user - Web search interactions to understand and to help users to provide assistance with their information searching. In attempting to develop models of IB, several studies have identified various factors that govern user's information searching and information retrieval (IR), such as age, gender, prior knowledge and task complexity. However, how users’ contextual factors, such as cognitive styles, affect Web search interactions has not been clearly explained by the current models of Web Searching and IR.

This study explores the influence of users’ cognitive styles on their Web search behaviour. The main goal of the study is to enhance Web search models with a better understanding of how these cognitive styles affect Web searching. Modelling Web search behaviour with a greater understanding of user’s cognitive styles can help information science researchers and IS designers to bridge the semantic gap between the user and the IS. To achieve the aims of the study, a user study with 50 participants was conducted. The study adopted a mixed method approach incorporating several data collection strategies to gather a range of qualitative and quantitative data. The study utilised pre-search and post-search questionnaires to collect the participants’ demographic information and their level of satisfaction about the search interactions. Riding’s (1991) Cognitive Style Analysis (CSA) test was used to assess the participants’ cognitive styles. Participants completed three pre-designed search tasks and the whole user - web search interactions, including think-aloud, were captured using a monitoring program. Data analysis involved several qualitative and quantitative techniques: the quantitative data gave raise to detailed findings about users’ Web searching and cognitive styles, the qualitative data enriched the findings with illustrative examples.

The study results provide valuable insights into Web searching behaviour among different cognitive style users. The findings of the study extend our understanding of
Web search behaviour and how users search information on the Web. Three key study findings emerged:

- Users’ Web search behaviour was demonstrated through information searching strategies, Web navigation styles, query reformulation behaviour and information processing approaches while performing Web searches. The manner in which these Web search patterns were demonstrated varied among the users with different cognitive style groups.

- Users’ cognitive styles influenced their information searching strategies, query reformulation behaviour, Web navigational styles and information processing approaches. Users with particular cognitive styles followed certain Web search patterns.

- Fundamental relationships were evident between users’ cognitive styles and their Web search behaviours; and these relationships can be illustrated through modelling Web search behaviour. Two models that depict the associations between Web search interactions, user characteristics and users’ cognitive styles were developed. These models provide a greater understanding of Web search behaviour from the user perspective, particularly how users’ cognitive styles influence their Web search behaviour.

The significance of this research is twofold: it will provide insights for information science researchers, information system designers, academics, educators, trainers and librarians who want to better understand how users with different cognitive styles perform information searching on the Web; at the same time, it will provide assistance and support to the users. The major outcomes of this study are 1) a comprehensive analysis of how users search the Web; 2) extensive discussion on the implications of the models developed in this study for future work; and 3) a theoretical framework to bridge high-level search models and cognitive models.