FACTORS AFFECTING ASSIGNED INFORMATION PROBLEM ORDERING DURING WEB SEARCH: AN EXPLORATORY STUDY

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ABSTRACT

Multitasking is the human ability to handle the demands of multiple tasks. Multitasking behavior involves the ordering of multiple tasks and switching between tasks. People often multitask when using information retrieval (IR) technologies as they seek information on more than one information problem over single or multiple search episodes. However, limited studies have examined how people order their information problems, especially during their Web search engine interaction. The aim of our exploratory study was to investigate assigned information problem ordering by forty (40) study participants engaged in Web search. Findings suggest that assigned information problem ordering was influenced by the following factors, including personal interest, problem knowledge, perceived level of information available on the Web, ease of finding information, level of importance and seeking information on information problems in order from general to specific. Personal interest and problem knowledge were the major factors during assigned information problem ordering. Implications of the findings and further research are discussed. The relationship between information problem ordering and gratification theory is an important area for further exploration.

INTRODUCTION

The research problem addressed in this paper is the growing and crucial need for a greater understanding of human multitasking and information problem ordering processes. Multitasking is the human ability to handle the demands of multiple tasks through task switching, including the ordering of those tasks. Task is defined as "a distinct work activity carried out for a distinct purpose" (Cascio, 1978, p. 133). Waller (1997) states that:

> "Individual-level multitasking processes involve a person's allocation of his or her own scare cognitive resources among several tasks and the moderating impact of task elements, task processes, and task resources on individual multiple-task performance" (p. 225)

When humans multitask, they work on two or more tasks, order those tasks, and switch between those tasks, either as individuals or within groups (Waller, 1997). Multitasking and task switching are mechanisms that help humans deal with the complex environment in which they live. People often switch between different types of tasks such as talking on the telephone, computing tasks or reading tasks and information tasks. In this study we use the more specific term information problem to describe the task being studied. Information problems can evolve and change over time.

In addition, the Merriam-Webster Online Dictionary defines *ordering* as arranging or regulating to eliminate confusion and setting a sequence. Task ordering studies are important to the study of human factors, human computer interaction, and cognitive science research (Diaper & Stanton, 2003; Iani & Wickens, 2004; Jerslid, 1927). The performance of multiple tasks is controlled by cognitive executive processes that enable humans to choose, prioritize and order tasks, and monitor, interrupt and adjust task performance (Arlington & Logan 2004; Iani & Wickens, 2004). Iani and Wickens (2004) state that the major open issue in this interdisciplinary research area "is how executive control processes establish priorities among

individual tasks and allocate resources to them thus allowing efficient multiple-task performance" (p. 2).

In the realm of information and human-computer interaction tasks, when people use a Web search engine they may multitask in two ways (Spink, Park & Jansen, 2006). First, people may begin their Web search with multiple information problems or second they begin with a single information problem and then develop additional information problem during the search process. Both processes may include information problem priority and ordering decisions, information problem switching, or switching back and forth between different problems during a search session. For example, a person may switch between seeking health information and new car information as they think and work on multiple information problems concurrently (Spink, Park & Jansen, 2006).

In this paper we report the results of a study of information problem ordering during Web search. Spink (2004) suggested that factors that affect personal or non-assigned information problem ordering driven are level of personal interest and problem familiarity. Limited research has focused on how people order their information problems when seeking information or search the Web. Information problem ordering is an important research area for understanding the cognitive processes associated with information behavior, including Web search with implications for personalization and user modeling.

The next section of the paper provides some background research related to our study.

RELATED RESEARCH

Multitasking, Dual Tasking and Task Switching

Multitasking is a critical human behavior that allows people to cope with ever more complex environments by handling dual tasks simultaneously or alternating multiple task switches (Lee & Taatgen, 2002). At the microsecond level of behavior, experimental

psychologists are studying many aspects of multitasking, dual tasking and task switching (Burgess, 2000; Monsell, 2003) and sequential actions (Carlson & Sohn, 2000). Rubinstein, Meyer and Evans (2001) and Just, Carpenter, Keller, Emery, Zajac and Thulborn (2001) found that human processing of two different types of tasks simultaneously can reduce human productivity on both tasks. Schumacher, Seymour, Glass, Fencsik, Lauber, Kieras and Meyer (2001) discuss how humans perform two distinct perceptual-motor or cognitive tasks simultaneously and argue that dual-task performance of perceptual motor tasks does slow due to mental scheduling process problems. Rogers and Monsell (1995) examine the costs of switching between simple cognitive tasks. Kray and Lindenberger (2000) found adult age differences in task switching.

Task Prioritization/Ordering

Freed (2000) suggests that task management and prioritization are affected by urgency, time, importance, duration and interruption/switching cost. Iani and Wickens (2004) identify the following factors that affect task switching, prioritization and ordering, including task complexity, cognitive or attentional tunneling, task importance, and environmental stimuli and events. They state that “one open issue is how executive control processes establish priorities among individual tasks and allocate resources to them thus allowing efficient multiple-task performance” (p. 2). Specifically, many studies have examined the factors that affect task prioritization and ordering by individuals and groups, particularly in aviation and military settings. Human factors and cognitive science studies have examined task prioritization/ordering, particularly by pilots. Colvin (2000) identify task importance as the main factor in task prioritization by pilots.

More generally, Gopher and North (1997) and Navon and Gopher (1979) found that during laboratory experiments that people are very efficient in attention allocation in task

prioritization. Alternatively, many studies show that real life task prioritization is not always as efficient as people avoid cognitive load prioritization tasks (Iani & Wickens, 2004; Liao & Moray, 1993; Lauderman & Palmer, 1995; Moray, Dessouky, Kijowski & Adapathya, 1991; Raby & Wickens, 1994). Hart and Wickens (1990) found that during low workloads people are more proactive in task prioritization, but during high workloads people are more reactive in task prioritization.

Alternatively, a growing body of studies is beginning to investigate multitasking information behavior. However, limited studies have investigated how people order information tasks.

Multitasking Information Behavior and Information Problem Switching

Recent studies have begun to explore multitasking information behavior and information problem switching, and non-linear information seeking processes (Foster, 2005). In general, multitasking and dual tasking is an important research area for information and Web technology designers (MacIntyre, et al., 2001). Studies show that Web users often engage in multitasking information behaviors (Spink, Ozmutlu & Ozmutlu, 2002). A research effort focused on modeling users' multitasking search behaviors can impact the development of technologies that support multitasking search and lead to improvement in search technology performance. Our approach to studying and modeling multitasking search is strongly based on and extends previous research findings from empirical studies that are discussed below.

Spink, Ozmutlu and Ozmutlu (2002) found that Web searchers often search on more than one information problem during a single search or multiple search interactions. Multitasking Web searches: (1) occurred frequently during search system interactions, (2) included a mean of 2-3 problems per search over different user groups within a range of 2-10+ problems per search, and (3) are longer than single problem search sessions with more keywords and

queries, and problem switching. Multitasking behaviors include searching for information related to one information problem and then switching to search for items on another information problem. Users often think and work concurrently on multiple information problems, but search for information on Web/IR technologies sequentially. IR system users' expressed problems in coordinating, tracking and managing their multitasking searches (Spink, Ozmutlu & Ozmutlu, 2002). Users' multitasking, coordination and management of different information search tasks is little understood or supported by current search technologies.

Studies show that people often have many information problems at hand at the same time (Spink, 2004). For example, a person may pool their information problems together and interact with the Web on more than one related or unrelated information problems. Overall, a user's single session with a Web search engine or a library may consist of seeking information on single or multiple information problems, and also switching among information problems (Spink, Ozmutlu & Ozmutlu, 2002).

In 1999, Spink, Bateman and Greisdorf (1999) found that eleven (3.8%) of the 287 Excite users responding to a Web-based survey reported multitasking searches. Spink, Ozmutlu and Ozmutlu (2002) show that IR searches often include multiple information problems, during a single search session or *multitasking search*. They found that multitasking information seeking and searching is a common human behavior as many IR system users conduct information seeking and searching on related or unrelated information problems. In addition, Web or IR multitasking search sessions are longer than single information problem sessions with mean problems per Web search ranging from one to more than ten information problems and a mean of 2.11 information problem changes per search session.

Recent studies have examined multitasking searching on the Excite and AlltheWeb.com Web search engines (Ozmutlu, Ozmutlu & Spink, 2003a, b). Ozmutlu, Ozmutlu and Spink (2003a) provide a detailed analysis of multitasking sessions on AlltheWeb.com and show that

almost one third of AlltheWeb.com users perform multitasking Web searching. Multitasking Web search sessions often included more than three information problems per session, are longer in duration than regular searching sessions, and most of the information problems in multitasking searches were switching among general information, computers and entertainment.

Ozmultu, Ozmutlu and Spink (2003b) found that multitasking Web searches are a noticeable user behavior, as one tenth of Excite users and one third of AlltheWeb.com users conducted multitasking searches. Multitasking Web search sessions are longer than regular search sessions in terms of queries per session and duration, with both Excite and AlltheWeb.com users searching for about three information problems per multitasking session and submitting about 4-5 queries per information problem.

Spink (2004) and Spink, Brumfield, Park, Alvarado-Albertorio and Narayan (forthcoming), studied multitasking information behaviors by public library users. They found that library users often engage in multitasking and complex information problem switching during their information seeking processes in a public library. Based on the study findings Spink (2004) suggest that when people have multiple concurrent information problems, they seek information on higher domain knowledge information and high personal interest problems before other information problems. Spink's (2004) comments were based on a case study where the study participant was seeking information on their own personal problems.

Spink, Park and Cole (2005) conceptualize IR as a multitasking process. Spink, Park and Jansen (2006) analyzed a sample of two-query and three or more query sessions that were filtered from AltaVista transaction logs from 2002. Sessions ranged in duration from less than a minute to a few hours. Findings include: (1) 81% of two-query sessions included multiple information problems, (2) 91.3% of three or more query sessions included multiple information problems, (3) there are a broad variety of information problems in multitasking search sessions,

and (4) three or more query sessions sometimes contained frequent information problem changes. Multitasking is found to be a growing element in Web searching.

Spink and Park (2005) discuss the interplay of information and non-information problems, provided a model of problem switching between information problem (Figure 1 below).

[Place Figure 1 Here]

Based on an examination of previous multitasking research, Spink and Park (2005) suggest that information problem ordering and switching may be affected by the many factors, including the (1) nature and complexity of content in relation to the information seeker's *domain knowledge,* (2) amount and depth of *information processing* required for different information problem, (3) information seeker's *level of interest*, including their attention and focus, in the information problem, and (4) level of *planning and priorities* by the information seeker in relation to their information problem.

In summary, various studies have identified that people often engage in information problem switching and have suggested factors that may affect information problem ordering. Further research is needed to understand how people order their information problems, to contribute to the development of better theoretical model of information searching or seeking behavior.

RESEARCH GOALS

The overall goal of our exploratory study is to investigate human assigned information problem ordering to enhance our understanding of Web search behavior.

The specific goals of the study are to examine:

1) If users seek information on higher level of domain knowledge or higher personal interest information problems before low domain knowledge and personal interest information problems,

2) Factors that affect users' ordering of assigned information problems during Web search.

This study is a continuation and enlargement of multitasking information behavior studies by the authors (Spink, 2004; Spink, Ozmutlu & Ozmutlu, 2002; Spink, Park & Cole, 2005; Spink, Park & Jansen, 2006).

RESEARCH DESIGN

Data Collection

Study Participants

The study included the collection of data from forty students engaged in information search problems via a Web search engine about their search behavior. A group of forty volunteers participated in the study. They are University of Pittsburgh students and staffs who engage in Web search interactions in the course of their academic or administrative activities. They regularly search the Web, CD-ROM databases, and computerized technologies for information.

A Call for Participation in the study was distributed throughout the School via email and notice-boards. Each study participant was paid $10 for their participation. A total of forty participants was selected to allow for any attrition or data collection problems from some participants, to ensure that data is collected from at least thirty to thirty-five study participants. Each study participant completed a consent form regarding their participation and rights/protections under the University of Pittsburgh Institutional Review Board (IRB) Human Subjects Research guidelines. A pilot study was conducted during the first month of the study with two student participants to pretest and refine the data collection and analysis techniques.

Study Procedures

Each of the forty study participants searched the Web using the Web search engine of their choice for information on three general knowledge problems listed below in the University of Pittsburgh, School of Information Sciences Computing Lab. Three general knowledge problems were chosen:

1. Find biographical information on Bill Gates of Microsoft
2. Find information on the disease rheumatic fever
3. Create a one-page list, which includes 5 items of books, articles or papers about Miami Beach.

Participants were also asked to find information on the same three information problems that were presented to then in random order. During the data collection, user search interaction was recorded using Camtasia Studio. Think aloud protocols were collected and each participant was interviewed about their Web search processes.

A pre-search interview questionnaire, provided in Appendix A, was used to collect data on individual level characteristics of respondents, such as their level of domain knowledge about the problems, search experience, and demographic variables. Each subject was asked to "think aloud" as they searched and were encouraged to express the reasons for their Web search actions. This "thinking aloud" stream was audio-taped and later transcribed by the research assistant. Subjects' searches were recorded and stored onto a disk for further analysis.

Data Analysis

Both quantitative and qualitative analysis methods were used. The data analyzed included the search logs, transcribed think aloud tapes, and interview notes using a grounded theory approach (Strauss & Corbin, 1990) and protocol analysis (Ericsson & Simon, 1993). The researchers have used these methods extensively in previous research modeling users' search

processes (Spink, Wilson, Ford, Foster & Ellis, 2002). Verbal protocol analysis is a research method that is frequently used by cognitive psychologists in order to understand users' thoughts as they engage in a problem or problem solving exercise (Ericsson & Simon, 1993). Verbal protocol data was transcribed by the research assistant, and analyzed to provide a classification of intentions associated with these interactions. We focused on understanding how users construct and manage multitasking searches, including the process of information problem switching and coordination. Results of the content analysis of the questionnaires and interview notes were used to develop preliminary typologies and orderings of Web search behaviors.

RESULTS

Demographic Characteristics

Table 1 shows the age of the forty (40) study participants.

[Place Table 1 Here]

Most of the study participants were between the age of 21 and 34 years old. No person under the age of 18 was included in the study. Two-thirds of the study participants were male and one-third was female. Most of the study participants were full time students. Some participants were employed, mainly in part time employment.

[Place Table 2 Here]

Web Use Characteristics

Frequency of Web Use

Table 3 show the frequency of Web use by study participants.

[Place Table 3 Here]

Most study participants stated that they used the Web on a daily basis. This finding is not unexpected for student study participants.

Web Browser Use

Table 4 shows the Web browser used by the study participants.

[Place Table 4 Here]

Most study participants were users of the Internet Explorer or the Firefox Web browsers.

Years of Web Experience

Table 5 shows the years of Web experience by the study participants.

[Place Table 5 Here]

Most study participants had between 6 and ten years of Web experience.

Web Search Engine Used

Table 6 shows the Web search engine used by each study participant.

[Place Table 6 Here]

Most study participants were users of the Google Web search engine.

Information Problem Ordering

Table 7 shows how the study participants ordered the three Web search problems.

[Place Table 7 Here]

The problem ordering data shows that:

- Nearly 1 in 2 study participants' first Web search was for information on Bill Gates.
- Nearly 2 in 3 study participants conducted their second Web search on the information problem of Miami Beach.
- Nearly 2 in 3 study participants conducted their third Web search on the information problem of rheumatic fever.

Overall, the search information problem order for most study participants was first Bill Gates, then Miami Beach and finally rheumatic fever. The next section of the paper examines the factors that affected study participants' information problem ordering.

Factors Affecting Information Problem Ordering

Table 8 shows the factors that affected study participants' information problem ordering.

[Place Table 8 Here]

Our study findings show that information problem ordering was affected by the following factors - problem familiarity, personal interest, perceived level of information available on the Web, ease of finding information, level of importance and seeking information on problems in order from general to specific. Personal interest and problem knowledge were the major factors in determining information problem ordering shown in Table 7.

Personal Interest – High to Low

Nearly half (45%) the study participants listed high personal interest as the major factor in their information problem ordering. Many study participants indicated a higher level of personal interest first in Bill Gates, then Miami Beach and finally rheumatic fever. One study participant stated "I ordered the order according to my interest" and "I went first with the search for articles/books about Miami Beach because I found that to be the most interesting problem amongst the three".

Problem Familiarity – High to Low

Some 25% of the study participants listed high problem familiarity as a major factor in their information problem ordering. Problem familiarity was not as important to study participants as personal interest in ordering their Web searches, but was a major factor. One study participant stated that they ordered their searches "by my estimation of my familiarity with each of the problems".

Ease of Finding Problem Information on the Web – High to Low

Nearly 20% of study participants listed high ease of finding problem information on the Web as a major factor in their information problem ordering. Ease of finding information was a less important factor for most participants than personal interest or problem knowledge. One

study participant stated “I thought findings books articles about Miami Beach will be easy. I decided to do that problem first”.

Problem Knowledge – Low to High

Interestingly, four study participants focused first on Web searches for which they had low problem knowledge. Such ordering may have been driven by curiosity or a desire to explore new problems. One study participant stated ‘I ordered my problems from least knowledge to most knowledge. In other words, I picked the problem I had the least knowledge about to the one I had more knowledge about. Sometimes, it takes longer to find valuable information about problems with which I have little knowledge”. This study participant ordered their problems as first rheumatic fever, followed by Miami Beach and then Bill Gates.

A second study participant stated “I ordered my search problems by how much I thought I knew about each one. I knew the least about rheumatic fever, so I did that one first, and I knew the most about Bill Gate’s life so I did that one last. I wanted to do the hardest problem first”.

Personal Interest – Low to High

One participant ordered their Web searches by focusing first on problems for which they had low interest first. One study participant stated “I ordered my search problems from least interesting to most interesting. This way I could get the ones I don’t care about out of the way, and save the ones I am interested in for the end. So I will retain the knowledge”. This study participant ordered their problems as first Miami Beach, followed by Bill Gates and then rheumatic fever. The other study participant who also ordered their searches from low to high interest, started with rheumatic fever, followed by Bill Gates and then Miami Beach.

Random Order

Two study participants listed randomness as a factor in their information problem ordering. Serendipity is more unusual in problem ordering that involves using equipment such as airplanes, but previous studies have shown a role for serendipity in information behaviors

(Foster & Ford, 2003). One participant stated “I ordered them randomly, I don’t really mind what order I searched for them in”.

Level of Problem Importance – Low to High

One study participant listed the level of problem importance as a factor in their information problem ordering. This study participant first searched for information on Bill Gates, followed by Miami Beach and then rheumatic fever, and stated “Finally looked for books, articles and papers about Miami Beach because …is not as interesting problem for me. I used to live there, but better a less depressing than Bill Gates and Rheumatic Fever”.

Search Problems – Least Specific to Most Specific

One study participant ordered their Web searches from least specific to most specific problem. This study participant first searched for information on Bill Gates, followed by Miami Beach and then rheumatic fever, and stated “I thought Miami Beach seemed like the most general category. Sometimes it takes a little while to come up with search terms and I thought it sounded like the most general”.

In summary, personal interest was the major factors driving assigned information problem ordering, followed by a high level of problem knowledge and a high ease of finding information on that problem.

DISCUSSION

Our study results provide insights into the information behavior of people seeking information. Spink (2004) suggested that factors that affect personal or non-assigned information problem ordering driven are level of personal interest and problem familiarity. The findings of our exploratory study show that for assigned information problems, personal interest and problem familiarity affected information problem ordering. Personal interest was the major

factor in information problem ordering. Familiarity and ease of finding information on a problem were also major factors.

Previous studies show that due to complex information needs, many people are seeking information on more than one problem concurrently. People may batch their interaction with an IR system and search on multiple problems during a single search session or over multiple related sessions. Therefore, during that information problem batching process, the priority/order of people's information problems is influenced by their level of personal interest in and personal knowledge of the information problem.

Interestingly, most people ordered their information problems from a high to low level of personal interest or problem familiarity. However, some study participants ordered their information problems from low to high level of personal interest or problem familiarity. Those who approached the problems from low to high often stated they were looking for a challenge rather than seeking an easier path. An information problem of low interest or problem knowledge was considered: (1) more interesting for those people or (2) it was a problem they wanted to remove first and they would then be able to move onto the more interesting problems later. This may also reflect how these study participants approach different types of problems in general.

Some study participants were conducting the harder, more challenging or more unpleasant problems first, and then rewarding themselves or delaying gratification, in line with delayed gratification theory (Blumer & Katz, 1974; Metcalfe & Mischel, 1999). As apposed to those people who seek positive gratification or rewards first and then move to more difficult or challenging problems. Within information behavior studies, Chatman (1991) related gratification theory and information seeking behavior, but does not mention delayed gratification. However, limited research has examined information behavior and gratification theory.

Our findings differ from previous task ordering studies that have largely focused on crew and pilot problem management (Iani & Wickens, 2004). Key factors that affected problem ordering in previous human factors studies were task importance, time and duration. The differences may reflect the differences in the tasks studied. Crew and pilot task performance studies largely focus on safety and effectiveness issues. Our study found limited focus by study participants on information problem importance, time or duration as factors that affected information problem prioritization and ordering. For Web information problems that are embedded in seeking behaviors, performance is measured as the quality of the information retrieved and its contribution to the resolution of peoples' information problems (Spink, 2002). However, these factors may be different in Web search situations where the subjects are under time pressure, e.g., in a business environment.

Limitation of this study include the use of assigned information problems using a small sample size of United States undergraduate and graduate students as study participants. Further studies are needed to examine information problem ordering for non-assigned information problems.

Findings from this exploratory study have implications for our understanding and modeling of human information behavior. Information systems and services are needed to support people working through their multiple and complex information problems. The current study is in need of replication and expansion.

CONCLUSION AND FURTHER RESEARCH

In conclusion, the results reported here support Spink's (2004) suggestion that when people have multiple concurrent information problems, they seek information on higher domain knowledge information and high personal interest information problems before other information problems. The research area is relatively new and critical area of information science research.

We are conducting further studies of information problem prioritization and ordering in non-assigned problem environments. Further research is also need to examine the relationship between information problem management and gratification theory.

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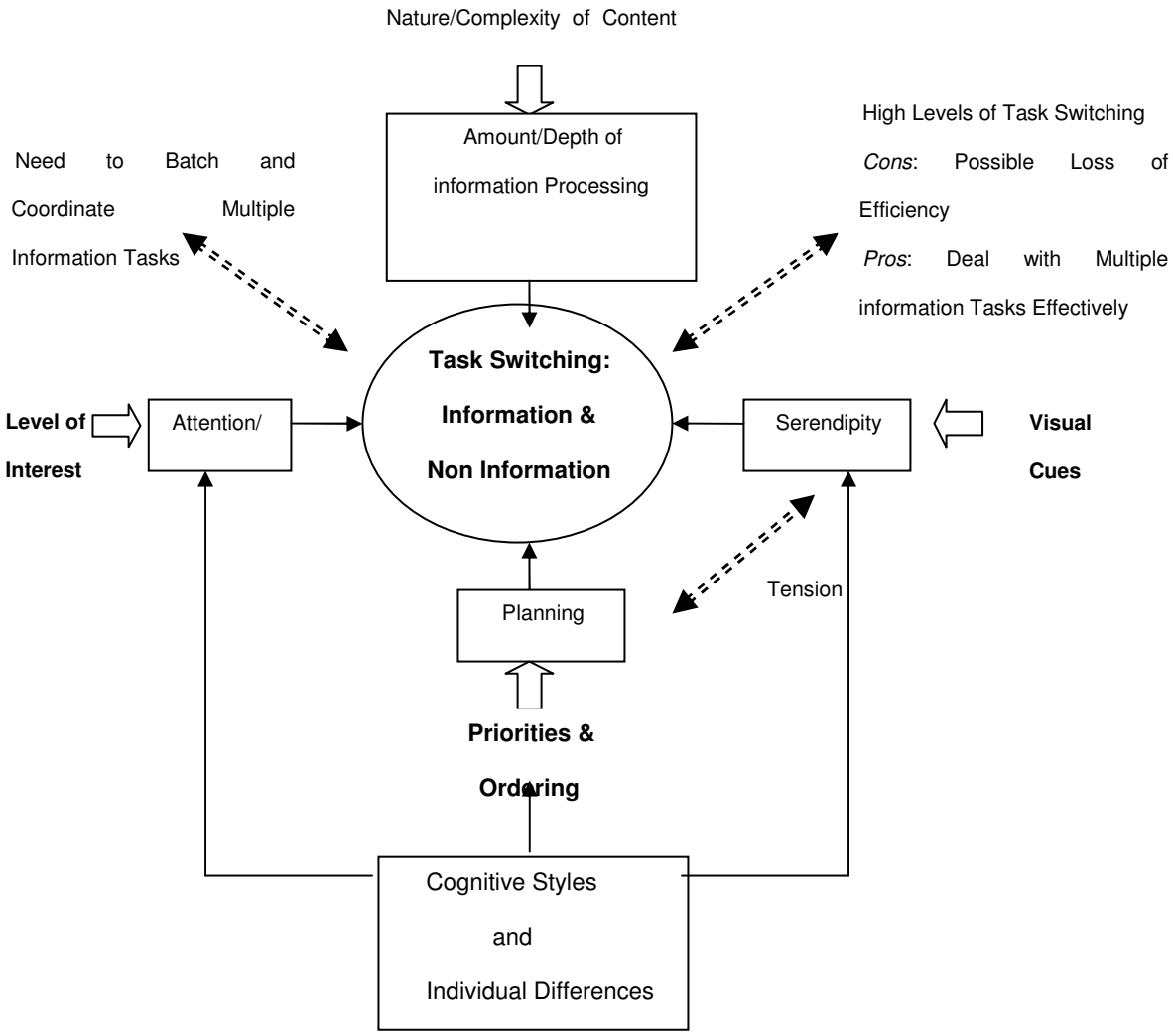
Figure 1. Model of task switching between information and non-information tasks.



Appendix A. Pre-Web Search Questionnaire.

For Project Use:
User Number: _____
Date:_____

PRE WEB SEARCH QUESTIONNAIRE

1. How long have you been using the Web to look for information?

2. How often do you use the Web for information?
___Daily _____Weekly _____Monthly _____Never

3. Which Web browser do you use most frequently for information?
(Ex. Internet Explorer, Netscape, Mozilla, Maxthon, MyIE, FireFox, Etc.)

4. Which Web search engine do you use most frequently for information?

5. Please tell us which categories below best describe you:
_____a) Full time student
_____b) Part time student
_____c) Employed full time
_____d) Employed part time
_____e) Other, please describe _____

6. What is your age?
_____a) 19-20 _____b) 21-25 _____c) 26-34 _____d) 35-49
_____e) 50-64 _____f) 65-74 _____g) 75 and over

7. Gender: Male ____ Female ____

Appendix B. Post Web search questionnaire.

For Project Use:
User Number: _____
Date:_____

POST WEB SEARCH QUESTIONNAIRE

1. Please Describe How You Ordered Your Search Information Problems.

2. Please Describe Why You Switched Your Information Problems During the Search Process.

Table 1. Age of study participants.

Age	Frequency	%
19-20 Years	4	10%
21-25 Years	12	30%
26-34 Years	17	42.5%
35-49 Years	6	15%
50-64 Years	1	2.5%
65-74 Years	0	0%
75+	0	0%
Total	40	100%

Table 2. Employment status of study participants.

Employment Status	Frequency	%
Full Time Student	33	66%
Part Time Student	2	4%
Employed Full Time	6	12%
Employed Part Time	9	18%
Total	40	100%

Table 3. Frequency of Web use.

Frequency of Web Use	Frequency	%
Daily	38	95%
Weekly	2	5%
Monthly	0	0%
Never	0	0%
Total	40	100%

Table 4. Web browser use.

Web Browser	Frequency	%
Internet Explorer	28	59.5%
Firefox	10	21.2%
Safari	4	8.5%
Netscape	2	4.2%
Mozilla	2	4.2%
Opera	1	2.15
Total	40	100%

Table 5. Years of Web experience.

Years of Web Experience	Frequency	%
1-5 Years	4	10%
6-10 Years	33	82.5%
11+ Years	3	7.5%
Total	40	100%

Table 6. Web search engine used.

Web Search Engine	Frequency	%
Google	35	83.3%
Yahoo!	5	11.9%
Alta Vista	1	2.3%
Vivisimo	1	2.3%
Total	40	100%

Table 7. Ordering of information problems.

Information Problem	Number	%
Miami Beach		
1st Search	11	27.5%
2nd Search	24	60.0%
3rd Search	5	12.5%
Total	40	100.0%
Bill Gates		
1st Search	19	47.5%
2nd Search	9	22.5%
3rd Search	12	30.0%
Total	40	100.0%
Rheumatic Fever		
1st Search	10	25.0%
2nd Search	5	12.5%
3rd Search	25	62.5%
Total	40	100.0%

Table 8. Factors affecting Information problem ordering.

Factors	Number	%
Level of Personal Interest – High to Low	18	45%
Level of Information Problem Familiarity – High to Low	10	25%
Level of Information Problem Information Available of the Web – High to Low	7	17.5%
Level of Personal Interest – Low to High	4	5%
Random Order	2	5%
Level of Importance – High to Low	1	2.5%
Information Problem Order - General to Specific	1	2.5%