TECHNOLOGICAL DETERMINANTS OF COMPELLING CONSUMER INFORMATION-SEEKING EXPERIENCES IN THE ONLINE MEDIUM

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***Abstract**: Experiences as purposefully designed commercial settings provide consumers a way to engage physically, mentally, socially and spiritually in the consumption of a product or service, which in turn ensure value-added to those product and services. The present paper discusses the prerequisites of creating extraordinary information-seeking experiences both for consumers preparing to make buying decisions and for those looking for information gathering as a source of entertainment. We propose an in-depth analysis of the online navigation systems' design features and their influence on consumers' emotional and cognitive involvement in information-seeking tasks, as they have been previously conceptualized and empirically tested by online flow research.*

***Keywords**: information seeking behaviors, navigation systems, interactivity, usability, flow experience*

1. Introduction

Online information seeking is the task of attempting to obtain information in a technological context. It is a complex and dynamic process including multiple stages. A review of the literature on information seeking behavior shows that information-seeking has generally been accepted as a complex and dynamic process (Marchionini, 1989; Sutcliffe and Ennis, 1998; Foster, 2005; Kuhlthau, 1991; 2006). Many accounts of the information-seeking process (Shneiderman et al., 1997; Marchionini, 1989; Broder, 2002; Marchionini and White, 2008) assume an interaction cycle consisting of (1) identifying an information need, (2) query specification, (3) examination of retrieval results, (4) (if needed) reformulation of the query, and (4) repeating the cycle until a satisfactory result set is found.

Standard web search engines support query specification, examination of retrieval results, and to some degree, query reformulation. Other steps are increasingly well supported by more recent intuitive search interfaces which attempt to help with problem formulation, information-reorganization, and the creation of new representations from gathered information. Nowadays, web applications tend to develop

towards becoming genuine interactive maps of users' cognitive and mental states during online navigation.

Navigation systems are "designed to aid users in the creation and interpretation of an internal mental model that helps them find and examine data on a web site." (Webster and Ahuja, 2006:663) On the other hand, computer-based navigation has been defined as "the decisions and actions that contribute to a person's ability to find and examine data organized in the computer medium" (Watts-Perotti and Woods, 1999:270). More generally, it has been conceived as "the creation and interpretation of an internal mental model" (Spence, 1999:921). A mental map helps people simplify the task of remembering the task of what they have seen, of the overall structure, rather than every page and link. When it represents a fairly accurate representation of the actual site structure, a person can use it to quickly navigate without a lot of mental effort. However, where the mental map doesn't match the ectual site structure, navigation can be slower than optimal and people can make incorrect inferences about what is and is not included on the site.

In the following sections of the paper we will analyze the impact of navigation system-related design factors on the users' optimal experience when searching for information online and will employ the flow theory to explain this impact.

2. Researching the impact of web design factors on the information-seeking experience

2.1 Theoretical background: the online flow theory

Flow theory was developed by Cszikszentmihalyi (1975) in an effort to understand and explain the nature of enjoyment and intrinsic motivation, as well as of activities that provided no obvious rewards. "Flow is the crucial component of enjoyment" (Cszikszentmihalyi, 1975:11) and it defines "the holistic sensation that people feel when they act with total involvement" (Cszikszentmihalyi, 1975:36). Flow is a positive, highly enjoyable state of consciousness that occurs when a person's perceived skills match the perceived challenges s/he is undertaking. When goals are clear, skills are up to the challenge, and feedback is immediate, people become involved in the activity. They become so involved that they may lose their sense of time and intrinsically enjoy what they are doing, without expecting any external reward or result, however feeling perfectly in control of what they are doing.

Developed in the reference discipline of psychology, flow theory was later imported in online marketing to explain consumers'

involvement with computer-mediated environments. Hoffman and Novak (1996) have initiated an innovative theoretical perspective which links the creation of special experiences in the online environment to facilitating *a flow state* (Novak *et al*., 2000; Chen *et al*., 2000; Skadberg and Kimmel, 2004; Novak *et al.*, 2003; Moore and Chipp, 2005; Finneran and Zhang, 2005; Siekpe, 2005). Many other researchers in the fields of communication and computer sciences who are interested in the same subject (for example, Ghani and Deshpande, 1994; Ghani *et al.*, 1991; Trevino and Webster, 1992) have also revealed the utility of the flow construct in explaining more general interactions between human beings and computers.

The web offers a special context to experiment flow because there is always a need to set goals (otherwise applications stop running), it offers rapid feedback to each action performed by the user, it requires attention focus and involvement, as well as acquiring and practicing special skills (other than the skills necessary in the offline world) (Chen, 2006). In an effortless movement trough cyber space, web users can enter a state in which their mind and action start to merge, and the physical surroundings start to fade. During these episodes, time stops its flow and correlates itself with the rhythm of the experience, while users tend to forget their everyday problems and become one with the keyboard and the screen, with the words they type and the images they see. (Chen *et al.*, 2000:270-271).

Web features helping users stay oriented during a search session are essential to entering and maintaining a flow state[1]. Online information seekers need a sense of context, of their place within the online organization of information. A common problem they face is disorientation, or the tendency to lose their sense of location on the web. This can negatively affect flow during online search by generating frustration and loss of interest. The cognitive dimension of the flow state is connected to a proper mental map of the internet structure during online searching. This is partly influenced by web design features.

2.2 Interactivity features enhancing optimal information-seeking experiences online

In flow models, rapid feedback and orientation are operationalized using the constructs of: (1) *interactivity* (Novak *et al.*, 2000; Huang,

[1] Staying oriented (a flow dimension identified as *sense of control*) is frequently a problem in virtual environments (Webster and Ahuja, 2006).

2003; Skadberg and Kimmel, 2004), (2) *value added search mechanisms* (Koufaris, 2000) or (3) a *fast, unambiguous feedback mechanism* (Guo and Poole, 2009). Skadberg and Kimmel (2004) and Novak *et al.* (2000) build upon Steuer's (1992) three-part conceptualization of interactivity: *speed*, *range* and *mapping*. *Speed of interaction* refers to the rate at which input can be assimilated into the environment, the *range of interactivity* refers to the number of possibilities of action at a certain moment, and *mapping* refers to natural and intuitive reactions of the system to actions initiated by users. However, in a large-scale pilot test Novak *et al.* (2000) achieved acceptable alphas only for *speed of interaction* (alpha=0,688, two-item scale) and used only that aspect of interactivity in their model testing (adding one supplementary item to the original scale).

(1) When I use the web there is very little waiting time between my actions and the computer response.
(2) Interacting with the web is slow and tedious. (R)
(3) Pages on the websites I visit usually load quickly.

Drawing also on Steuer's (1992) model, Skadberg and Kimmel (2004), hypothesized that *interactivity*[2] is determined by the *response speed* (as suggested by Steuer)[3] and the *ease of use*[4]. The direct impact of the ease of use on interactivity had a magnitude of 0.8960. Tests didn't however confirm *speed* as a determinant of interactivity. In Skadberg and Kimmel's (2004:407) study, *interactivity* "refers to the response triggered by the user", while *ease of use* describes the navigational characteristics of a web site, "the ease with which visitors can locate the relevant information for which they are searching. (Skadberg and Kimmel, 2004:414)"

Huang's (2003) research presents interactivity as a key feature influencing information seekers and entertainment surfers. They operationalized interactivity from a user-oriented perspective[5] with items such as *active, responsive* (responding to users' needs), *interactive*,

[2] The scale used had three items: (1) I felt I had the freedom to go anywhere in the web site, (2) Interacting with the web site was easy and (3) The web site's response to my actions (such as clicking a link) was fast.
[3] The scale used had two items: (1) The web site speed is fast and (2) There is little waiting time for the web pages to load.
[4] The scale used had two items: (1) I had no problem finding what I wanted and (2) Navigation of the web site was simple and easy.
[5] "Technology-oriented attributes are structural properties of a website, whereas user-oriented properties are the qualitative experiences of users in relation to the structural attributes of a site." (Huang, 2003:426)

participatory (users can modify or add information)[6], *dynamic* (offering unrestrained navigation), and *demonstrable* (stimulating/ incorporating humanlike characteristics). Statistical tests demonstrated the scale's satisfactory reliability (Cronbach's Alpha = 0.70).

Guo and Poole`s (2009) conceptualization of *a clear feedback mechanism* entails its capacity to show the user his/her progress in achieving an online goal (search goal, shopping goal, etc). The meaning of their interactivity-related construct is connected to the clear rules one can use to tell how he or she was doing. The authors measured the construct using a four item-scale, which they successfully validated in an online shopping context (Cronbach's Alpha = 0.88):

(1) *It was really clear to me that I was doing well*,

(2) *I was aware of how well I was performing*,

(3) *When shopping, I had a good idea about how well I was doing*,

(4) *I could tell by the way I was surfing how well I was doing*.

However, for Guo and Poole (2009), the clear *feedback mechanism* is also a mediating precondition of a web site's *complexity* (see the following sections) impact on flow intensity.

2.3 Reducing informational complexity to improve online search experiences

A related concept both to *interactivity* and *ease of use* used in online flow models is *usability*. *Usability* generally refers to a large category of attributes that make the web easy to use. Some degree of complexity is required to make sites and applications interesting, but too much can inhibit desirable flow states.

Pace (2003) posits that a poorly designed interface can disrupt a flow experience by demanding an excessive amount of attention. The author identified seven design elements that affect a web site's usability: *response times*, *organization of content*, *links*, *navigation support/cues*, *page layout*, *color* and *pop-up advertisements*. Thus, in a qualitative study, Pace (2003) identified *navigation support* as an important issue of interface usability, where the principle of transparency is particularly important. "A transparent navigation system allows users to focus attention on the content of a site and the task at hand, rather than the mechanics of moving through an information space" Pace (2003:168). In his qualitative study he found that people like, for example, when web sites offer repeating page elements such as headings and navigation controls. It helps them keep track of their navigation moves and having

[6] "When users are given the opportunity to create content, information exchange is facilitated ." (Huang, 2003:428)

each moment an overview of the site. Pace named this perceived web site characteristic *visual consistency.* Another aspect of navigability mostly discussed by Pace's respondents is *behavioral consistency* and it describes the property of web interfaces to respond to users' actions in predictable ways. When clicking the Back button, for example, users usually expect to return to previously visited pages, not being bounced to an undesired location.

Guo and Poole (2009) also consider that one of the elements which ensure increased usability is *coherence* – that is applying a unitary pattern of presenting information, instruments and surfing clues and/or a unitary interface for similar tasks. They study the web site complexity (a concept opposed to that of usability) as one of the important interface design variables that (negatively) influence flow. The empirical findings indicate that the aspects of web sites with the highest loadings on complexity were whether the sites seem logical and organized, coherent and open designed, and the predictability of site behavior.

For Huang (2003), complexity refers to the amount of information that a site is perceived to offer. In his view, both the topical range and the structural properties of a website contribute to how complex it is perceived. Study results are consistent with the information-load perspective (Hoffmann and Novak, 1996), demonstrating that complexity distracts users from relevant information and thus negatively influence their flow state. For evaluating complexity he used a five-item scale, requiring users' appreciation of the website most frequently visited: (1) *multidimensional; (2)rich;(3) multiple; (4) large scale; (4) broad.*

3. Previously tested influences of design factors on flow

The reviewed studies (Novak *et al.*, 2000; Koufaris, 2002; Huang, 2003; Skadberg and Kimmel, 2004; Guo and Poole, 2009) support the importance of web page design elements as antecedents of a flow-type experience (Table 1). Novak *et al.* (2000) used a limited operationalization of interactivity as *speed of interaction* and confirmed a statistically significant relationship between this and the flow state. However, greater *speed* did not correspond to greater *focused attention* or *telepresence* and *time distortion*, according to their test results.

In Skadberg and Kimmel's (2004) structural model, interactivity demonstrated a moderate causal relationship with the flow state. However, contrary to the original hypotheses, speed was not associated with the level of interactivity and Skadberg and Kimmel's (2004) study thus infirmed Steuer's (1992) model. On the other hand the results confirmed the anticipated contribution of the *ease of use* to interactivity,

as it was formulated on the theoretical grounding of Beck and Cable's (1998) study.

Koufaris' study (2002) found that the use of *value-added search mechanisms* influences the experience of online consumers, that can in turn affect their behavior. However, the tests only confirmed the positive relationship with *shopping enjoyment*, not the ones with *perceived control* or *concentration*. Thus, the author concludes that "it may be the case that for online consumers, not simply web users, a multidimensional flow construct does not explain their behavior, while a simple construct like shopping enjoyment does." (Koufaris, 2002:218)

Huang (2003) tested web site *complexity*`s and *interactivity*`s influence on flow. Treating flow as an overall experience, results of the structural equation modeling analysis showed that interactivity is the key to creating experiential flow (coefficient = 0.27, t = 2.73). Analysis of components of flow showed that interactivity increased *control* (coefficient = 0.67, t = 3.30), *curiosity* (coefficient = 0.57, t = 3.80), and *interest* (coefficient = 0.07, t = 1.75). The empirical tests performed by the author demonstrate a positive relationship between *interactivity*, as web site characteristic, on the one side, and *curiosity*, as flow dimension, on the other. Tests also revealed the fact that users' *attention* (another fundamental flow dimension in his view) is distracted by the complexity of the web site.

Table 1
System-related factors and their relationships to flow

Study	Technological feature	Flow construct	Relationships confirmed
		Interactivity	
Novak et al. (2000)	interactivity determined by the *speed* of interaction	unidimensional	speed of interaction → flow
Skadberg & Kimmel (2004)	interactivity determined by *speed* and *ease of use*	unidimensional	ease of use → inter-activity → flow
Koufaris (2002)	replaced by the concept *value-added search mechanisms*	multidimensional (dimensions tested as separate constructs)	value-added search mechanisms → shopping enjoyment (as flow dimension)
Guo & Poole (2009)	replaced by the concept of *unambiguous feedback mechanism*	a second-order factor with six first-order factors (dimensions)	complexity → flow
		Complexity	
Guo & Poole (2009)	*structural complexity* (the perception of the web site's design)	a second-order factor with six first-order factors (dimensions)	complexity → feed-back mechanism → flow
Huang (2003)	complexity as a site's information load	multidimensional	complexity → flow

Source: developed by the author

Unlike their predecessors (Novak *et al*., 2000; Skadberg and Kimmel, 2004; Huang, 2003), Guo and Poole (2009) underlined that the

effects of the *site complexity* on the flow state are mediated by pre-conditions of the flow state, that is, by the *balance of challenge and skill, the clarity of goals* and the *feedback mechanism.* However, the results of their empirical study only confirmed the positive relationship between the *feedback mechanism* and the flow state. The research also validated the effect of the web site complexity on flow through strong negative correlations with all the three of its pre-conditions and proved the superiority of indirect influence over direct influence.

4. Conclusions and future research agenda

Based on the multiple results presented, we posit that the degree of interactivity of the online navigation systems and their usability level enhance flow experiences during online information-seeking activities and propose testing this relationships in a commerce-related information-seeking context.

Interactivity and usability are the crucial factors in the development of new web interfaces and applications for intelligent terminals, which are conceived to be used in different contexts and situations. In order to actively involve consumers in conceiving and implementing marketing communication programs, web designers should offer a rich and yet responsive experience, plus tools to help users accomplish their goals quickly and easily. Also, in order to help online information-seekers find their way and easily form mental maps of the information available, design factors should include signposts and keep the layout uncluttered in order not to unnecessarily distract attention.

The ability to create meaningful information-seeking experiences will hinge largely on how businesses manage the content-context interface. Facilitating flow experiences could have interesting impacts on playful, risk-taking and exploratory behaviors, without distracting the users from task completion – that is from detecting the useful information. Marketing should limit the risk of confusion and information load, and support, guide and facilitate favorable, pleasant web experiences, in order to maximize communication impact and customer lifetime value.

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