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Experiential Fit: Applying Task-Technology Fit Theory to Experiential Consumer Tasks

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ABSTRACT

The purpose of this research effort is to apply Task-Technology Fit (TTF) theory to understand how to effectively support experiential consumer tasks. A 2x2 experiment was designed to consider fit issues related to **task characteristics** (task type: search vs. experiential) and **technology characteristics** (interface structure: search-oriented vs. experiential-oriented) along with **individual characteristics** (consumer personality: conscientiousness vs. openness/agreeableness).

Keywords
Consumer Behavior, Electronic Commerce, User Interface Design, Personality Traits, Task-Technology Fit

INTRODUCTION

The purpose of this research study is to explore how B2C interfaces can be designed to support a broader range of consumer tasks, namely search and experiential tasks. Seminal research on information presentation is reviewed and a case is made for the use of task-technology fit (TTF) theory as a viable means for understanding how the congruence between task type and interface design can lead to certain performance impacts (e.g., information retention/recall). Further, TTF provides the latitude to consider certain individual characteristics as factors that potentially affect how consumer interfaces are perceived. In this study, consumer personality traits that augment the fit between task and technology are examined as well.

The paper is organized in the following sections. First, the theoretical foundations for the project are reviewed and the hypotheses are presented. The research design and experimental procedures are described in the methodology section. Lastly, the current status of the project and the conference presentation is discussed.

THEORETICAL FOUNDATIONS: FITTING TASKS TO THE INTERFACE

Issues associated with the tables vs. graphs dichotomy were the primary focus in early MIS information presentation research (Lucas, 1981; Benbasat and Dexter 1986; Benbasat, Dexter and Todd, 1986; Dickson, DeSanctis and McBride, 1986; Jarvenpaa and Dickson, 1988). However, the equivocality of the results from these studies prompted a re-examination of the key factors that influence various modes of information presentation. One key insight was the need to carefully consider the mode of information presentation given the task being executed (Dickson, DeSanctis and McBride, 1986). Lucas and Nielsen (1980) also pointed to the characteristics of the interface user as an important factor that significantly affects how users perceive different modes of information presentation, which has since been well established as an important factor for designing effective user interfaces (Aykin and Aykin, 1991).

Building on the seminal work in information presentation, subsequent research has addressed both the need to carefully qualify the task as well as certain individual characteristics. With respect to task characteristics, researchers have concentrated on the importance of fit between the information representation and task characteristics (Vessey, 1991; Vessey and Galletta, 1991). Building on the congruence between technology and task characteristics, a broader theoretical model was proposed called Task-Technology Fit (TTF), which included individual characteristics in addition to the task and technology factors (Goodhue, 1995; Goodhue and Thompson, 1995).

TTF provides a relevant and comprehensive theoretical framework for addressing the issues related to the current consumer interface design study (see Figure 1). First, *task characteristics* apply to the underlying characteristics that differ between search and experiential tasks. Second, *technology characteristics* pertain to the attributes associated with consumer interface design; specifically interfaces that have a search vs. experiential orientation. Third, *individual characteristics* encompass the inherent differences that exist across a heterogeneous set of consumers, in this particular case – personality. Finally, the congruence of these three preceding factors is used to predict and understand any *performance* related issues, such as information retention and recall.

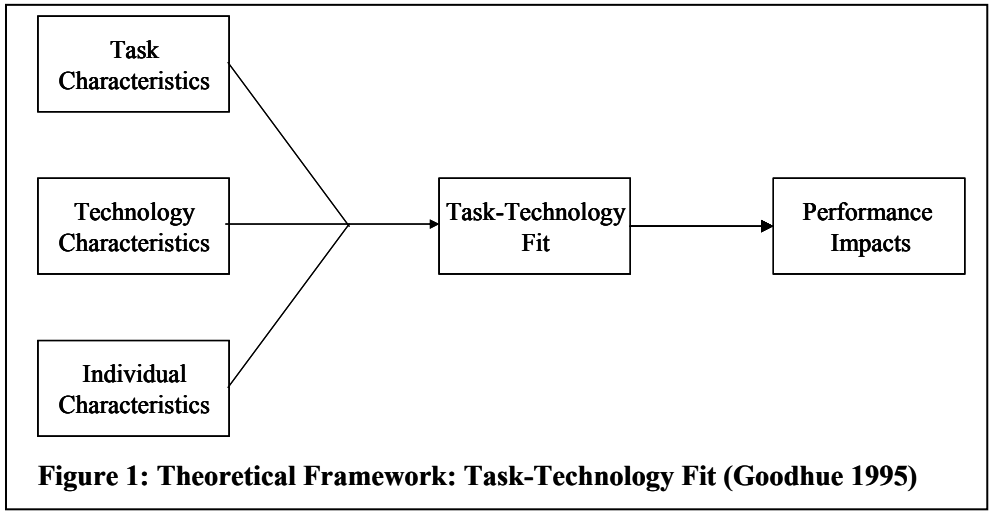

Figure 1: Theoretical Framework: Task-Technology Fit (Goodhue 1995)

Experiential Fit

A core principle of TTF theory stresses the need for technology to be congruent with the cognitive structure of the task, which is categorized across two categories: symbolic vs. spatial (Vessey, 1991). Symbolic tasks have been described as the processing of "discrete, and therefore precise, data values" (Umanath and Scamell, 1988) and are analytical in nature. Spatial tasks have been described as "making associations or perceiving relationships in the data" (Washburne, 1927) and are perceptual in nature. This task categorization (symbolic vs. spatial) is comparable to the search vs. experiential task categorization. Further, interface design structures are proposed that are cognitively congruent with search and experiential tasks, respectively. Lastly, it has been posited that certain consumer personality traits are more oriented toward structured task domains (i.e., need for structure) while others are more conducive to unstructured task domains (i.e., tolerance for ambiguity). The remainder of this section further addresses these fit issues and presents related research hypotheses.

Task Characteristics: Search vs. Experiential

While task characteristics have traditionally been a key consideration when designing user interfaces, the emergence of eCommerce has placed an added emphasis on consumer-oriented tasks. Mathwick, Malhotra and Rigdon (2002) argue that the inherent properties of the task, analytic vs. perceptual, dictate how a consumer will process the informational attributes associated with the task. Hoffman and Novak (1996) use a consumer's search motive to qualify tasks across two categories: search vs. experiential tasks. Using the TTF task classification, we posit that search tasks are more symbolic in orientation as they are analytic, goal-directed tasks (Alba, Lynch, Weitz, Janiszewski, Lutz, Sawyer, and Wood, 1997) that rely on categorical, discrete information presentation. Conversely, we posit that experiential tasks are perceptual, open-ended tasks (Wolfinbarger and Gilly, 2001) that rely on spatially-related information. Thus, we define an *experiential task* within the context of this study as *a perceptual, open-ended task that consumers perform to process spatial informational attributes associated with a business domain*.

The strategic fit between search tasks and electronic commerce has been quite strong, mainly because such tasks depend on discrete, informational attributes such as price and availability. Conversely, experiential tasks rely on an ability to provide the consumer with a means for processing the experiential attributes of a product/service (e.g., spatial dimensions), which are inherently more difficult to present in an electronic commerce context (Alba, et al., 1997). Thus, a challenge exists to expand the capabilities of electronic commerce interfaces to effectively support experiential tasks.

Technology: Experiential Interfaces

As stated earlier, the most common type of eCommerce task is search-oriented. Not surprisingly, the majority of B2C interfaces are designed to facilitate the execution of search tasks. Such interfaces, hereafter referred to as *search-oriented interfaces*, are hierarchically structured using discrete information categories to facilitate an analytic information search (see Figure 2a). Staying consistent with TTF theory, symbolic tasks (e.g., search tasks) are more efficiently executed if the problem representation (e.g, interface) contains symbolic attributes (Vessey, 1991; Goodhue, 1995). Thus, we posit that search-oriented interfaces are cognitively congruent with search tasks, which allow for more effective and efficient execution of such tasks. Yet, search-oriented interfaces are not designed to present the spatial, perceptual attributes that consumers desire when executing an experiential task.

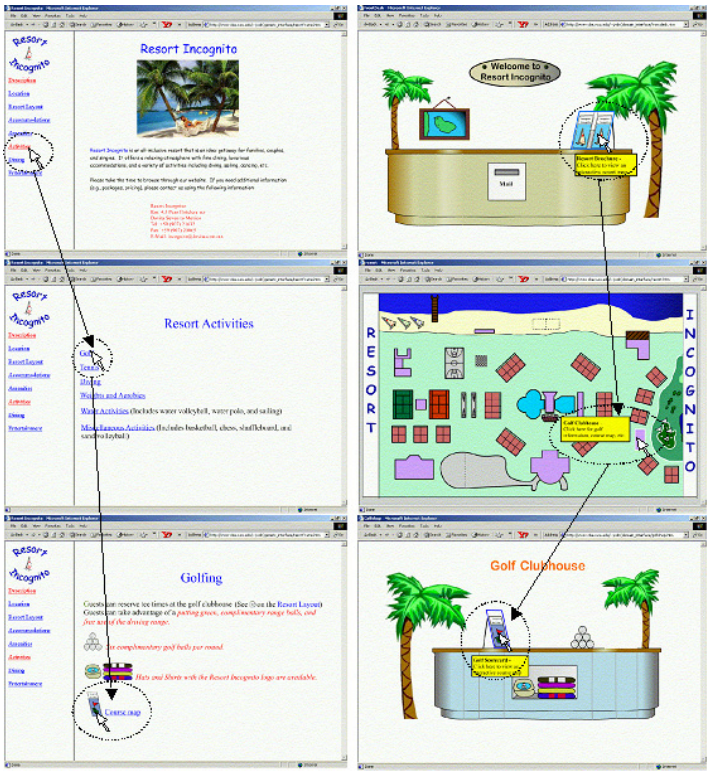

Figure 2a: Search Interface Figure 2b: Experiential Interface

Because the information being presented to consumers in an electronic commerce interface is often related to their perception of the physical business domain, these domains act as potential sources for designing B2C interfaces. Hence, the consumer's perception of the task domain can be used to design and structure the interface, hereafter referred to as an *experiential-oriented interface*, that effectively support experiential tasks (see Figure 1b). In turn, more effective information presentation allows consumers to retain and recall information for a number of consumer-related tasks (Johnson and Russo, 1984).

> *H1a: When executing a search task, consumers will perform better when using a search-oriented interface versus an experiential-oriented interface*
>
> *H1b: When executing an experiential task, consumers will perform better when using an experiential-oriented interface versus a search-oriented interface*

Individual Characteristics: Personality

Personality has been observed to be an important factor that can influence human-computer interaction (Aykin and Aykin, 1991). The Big Five model (McCrae and Costa, 1987) identifies five trait clusters: Agreeableness, Extraversion, Neuroticism, Openness to Experience, and Conscientiousness.

For the purposes of our study, we draw a parallel between task type and personality characteristics through two bi-polar categories that have been identified by personality and psychology literature: personal need for structure (Neuberg and Newsom, 1993) and tolerance for ambiguity (Budner, 1962). Need for structure or precision is described by motivation to reduce cognitive load through categorizing information into a simplified form, which has been observed to be positively related to Conscientiousness (Viswanathan, 1997).

> *H2a: When executing a search task, consumers with the conscientiousness personality trait will perform better when using a search-oriented interface versus an experiential-oriented interface*

Tolerance for ambiguity is defined as "the tendency to perceive ambiguous situations as desirable" (Budner, 1962, p. 49). Therefore, while we suggest that people with a need for precision will perform analytical/structured (i.e. search) tasks more effectively, people with high tolerance for ambiguity will be more effective in performing perceptual/unstructured (i.e. experimental tasks). In the personality literature, both Openness to Experience (Viswanathan, 1997) and Agreeableness (Strauss, Connerley and Ammermann, 2003) have been observed to be traits that are positively related to a tolerance for ambiguity.

> *H2b: When executing an experiential task, consumers with the openness to experience personality trait will perform better when using an experiential-oriented interface versus a search-oriented interface*
>
> *H2c: When executing an experiential task, consumers with the agreeableness personality trait will perform better when using an experiential-oriented interface versus a search-oriented interface*

METHODOLOGY

The research model shown in Figure 2 was developed from a review and integration of the consumer behavior and TTF literature.

Research Methodology

A 2x2 experiment was designed to consider fit issues related to task characteristics and technology characteristics as well as individual characteristics. Subjects are randomly assigned to one of the four treatment conditions. A pre-experiment survey is administered to ascertain the subjects' personality traits: conscientiousness, extroversion, neuroticism, agreeableness, and openness.

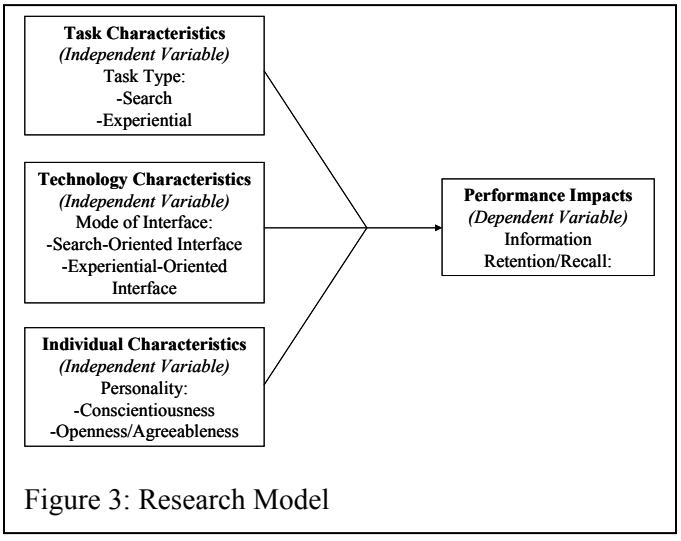

Figure 3: Research Model

Independent Variables

Task Type: The task type independent variable consists of two levels: search and experiential. To operationalize a search task, a set of structured, goal-oriented questions were designed where the answers came in the form of discrete unties of information. Conversely, an experiential task was operationalized by designing a broad, information-browsing task where the answers came in the form of spatially-related information pertaining to the business domain.

Mode of Interface: The mode of interface independent variable consists of two levels: search-oriented and experiential-oriented. The search-oriented interface was designed using established HTML design principles that are commonly used in industry (Vora, 1998) and was structured using informational categories (i.e., logical information groups) (See Figure 2a). The experiential-oriented interface was structured using concrete, recognizable objects from the business domain to create a virtual experience of the business domain (see Figure 2b).

Consumer Personality: The personality traits of interest for this study are conscientiousness, agreeableness, and openness, which were derived using the five-factor personality model (Trapnell and Wiggins, 1990). To be complete, the other two traits (extroversion and neuroticism) are included in the study to look for any non-hypothesized effects associated with these five-factors.

Dependent Variable

Because of its significance as an important factor in the seminal consumer behavior literature, information retention/recall (Bettman and Kakkar, 1977) is the dependent variable for this particular study. A total of 10 multiple-choice questions designed to test levels of information retention/recall for the search and experiential tasks, respectively. The 5 questions related to the search task tested for information that was explicitly requested. The 5 questions associated with the experiential task tested for spatially-related information within the problem domain.

Current Status and Conference Presentation

The experimental application has been developed and an initial pilot study has been administered with a full experiment currently in progress. The conference presentation will include a complete data analysis and discussion of the results.

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