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The Effects of IS Success on Competitive Behavior

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ABSTRACT

This research paper relates user satisfaction-based measures of IS success with competitive behavior. Drawing from research in the MIS and strategic management domains, this paper proposes mediated relationships in which user satisfaction influences a firm's ability to execute competitive actions, which in turn affects firm performance. In particular, this research posits that information systems characterized by high levels of decision support satisfaction assist in the development of successful strategic competitive actions and information systems having high levels of task support satisfaction facilitate rapid retaliatory responses to competitor's initial tactical actions.

INTRODUCTION

Researchers in strategic management have given significant consideration to the effects of strategic and tactical actions on firm performance. Strategic actions are defined as those actions that involve significant commitments of specific, distinctive resources (Smith *et al*., 1991). Alternately, tactical actions are designed to fine-tune strategy; they involve fewer or more general resources, and are easier to implement or are more reversible as compared to strategic actions (Smith *et al*., 1991). While the relationship between competitive actions and firm performance has been widely studied, a user's satisfaction with information systems that facilitate such strategic and tactical actions has only received indirect attention in extant literature. By merging current research from the MIS field with that from the strategic management literature, the relationship between users' satisfaction with an information system and a firm's execution of competitive action may be better understood.

Studies of inter-firm rivalry examine the action-response dyad and consider the effects of both strategic and tactical actions on firm performance. Smith *et al*. (1991) posited that firm performance is positively related to that firm's likelihood of response to a rival's competitive action, but negatively related to that responding firm's propensity to imitate the initial attack, average response order, and average response lag. In a similar study, Chen and Miller (1994) found that firm performance was negatively associated with the likelihood that a firm's initial attack invokes a retaliatory response. Firms that are able to orchestrate competitive attacks that do not provoke retaliation outperformed those firms whose overt attacks triggered counter-actions.

A growing body of research has focused on the relationship between information technology and firm performance. In a theoretical paper, Matta *et al*. (1995) proposed that IT managerial skills can be a source of sustainable competitive advantage and further implied that the lack of IT capabilities may place a firm at a strategic disadvantage. Using a matched comparison group methodology, Bharadwaj (2000) found that the level of firm-specific IT capabilities positively relates to firm performance. In their study of IT and competitive advantage, Sethi and King (1994) found that unique applications of IT provide a source of competitive advantage by facilitating preemptive strikes, which force competitors to undertake undesirable postures.

By integrating strategic management and MIS research, this paper seeks to add to the body of strategic IS literature by: (1) establishing theoretical linkages between information system user satisfaction and competitive behavior and (2) proposing an alternate mechanism through which IS user satisfaction affects firm performance. Specifically, this research posits that information systems characterized by high levels of user satisfaction enable the successful execution of strategic actions and tactical responses, which in turn lead to improved firm performance. Using key elements from Kim *et al.'s* (2002) user satisfaction-based IS success model, this research seeks to establish the relationship between information system user satisfaction and competitive behavior. While the overall scope of this research is predicated upon the theoretical model presented in Figure 1, this paper focuses on the relationships between task/decision support satisfaction and the ability to execute successful strategic actions/tactical responses (indicated in bold).

This research is motivated by several issues highlighted in contemporary MIS literature. First, in presenting their updated model of IS success, DeLone and McLean (2003) note that IS success is "critical to our understanding of the value and efficacy of IS management actions and IS investments" (p. 10). Second, Au *et al*. (2002) state that models of user satisfaction may not adequately capture the full meaning of effectiveness, as attitudes may not fully link to behaviors; the conceptual model presented in this paper explicitly considers the relationship between user satisfaction and effectiveness. Third, the relationship between user satisfaction and firm performance has only received limited attention in extant research. This study addresses this research gap by proposing a conceptual model in which user satisfaction is related to the effective execution of strategic actions and tactical responses.

THEORETICAL MODEL

Theoretical support for the conceptual relationships highlighted in Figure 1 is presented in the following three sections. The first and second sections address IS success and inter-firm rivalry, respectively. The third section attempts to integrate key concepts from the MIS and strategic management domains in an effort to substantiate the conceptual relationships highlighted in Figure 1.

IS Success

Building on the theoretical works of DeLone and McLean (1992), Garrity and Sanders (1998) developed an IS success model that incorporates four dimensions of user satisfaction: interface satisfaction, task support satisfaction, decision support satisfaction, and quality of work-life satisfaction. Kim *et al*. (2002) refined the Garrity and Sanders (1998) IS success model, as presented in Figure 2, and found strong empirical evidence for the hypothesized relationships. In a separate study, Sherman *et al*. (2002) also found strong empirical evidence for the Kim *et al*. (2002) user satisfaction-based IS success model. In Figure 2, task support satisfaction and decision support satisfaction are

Figure 1. Theoretical Model

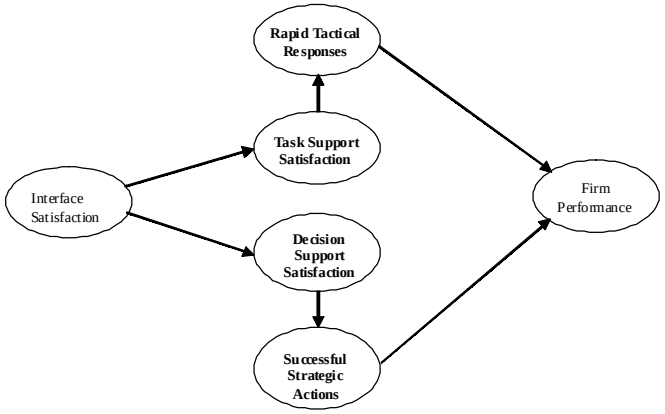
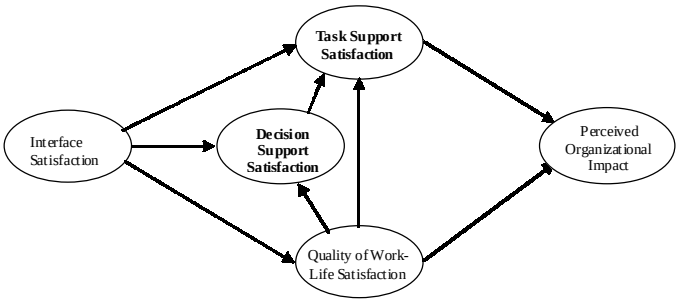


Figure 2. User Satisfaction-Based Information Systems Access (Kim et al., 2002)



presented in bold font as these constructs are essential to the theoretical model on which this research is based.

Within the context of the SISS model, Kim *et al.* (2002) define decision support satisfaction as the "belief an individual has that the computer system is able to provide information and decision support toward the goal of controlling a business process" (p. 10). A decision process can be defined as 'the set of actions and dynamic factors that begin with the identification of a stimulus for action and end with a specific commitment to action' (Mintzberg *et al.*, 1976). Decision support is particularly salient when the user is faced with a complex, unstructured situation (Mintzberg *et al.*, 1976). When faced with complex situations, decision-makers seek to reduce the complex decision into a series of manageable sub-decisions in which the decision-maker can apply heuristics and reference past experience (Mintzberg *et al.*, 1976). Iaquinto and Fredrickson (1997) noted that the unique content, timing, and quality of a firm's strategic actions are often credited to its strategic decision-making process. Strategic decisions are those decisions that affect a firm's long-term performance and are generally irreversible in nature (Mintzberg *et al.*, 1976). As such, strategic decisions and the resulting competitive actions may be favorably affected by the quality of the information system's decision support capabilities. Based on the decision-making theory developed by Mintzberg *et al.* (1976), an IS characterized by high decision support satisfaction may effectively simplify a user's decision-making process by: (1) facilitating the compartmentalization of a complex decision into sub-decisions and (2) providing information that assists the generation and evaluation of decision alternatives for each sub-decision.

Task support satisfaction refers to the user's level of confidence that the information system will facilitate the successful completion of his/her job responsibilities and task requirements (Kim *et al.*, 2002). Task support satisfaction is contingent upon the fit between the task at hand, the technology employed, and the user (Garrity *et al.*, 1998). Certain tasks are best facilitated with certain technologies; as the gap between the requirements of a task and the functionalities of a technology widens, the fit between the task and technology is reduced (Goodhue *et al.*, 1995). Goodhue and Thompson (1995) postulated that greater levels of task-technology fit lead to higher levels of IS utilization and individual performance; users are more likely to use the information technology to complete their tasks, increasing the likelihood of the successful completion of a portfolio of tasks by the user.

Inter-Firm Rivalry

Porter (1980) characterized rivalry by stating, "Firms feel the effect of each other's moves and are prone to respond to them". Consistent with this characterization of rivalry, researchers have focused on the action-response dyad as the fundamental unit of observation when studying rivalry (Chen *et al.*, 1992). In this line of research, an action is defined as "a specific and detectable move" and response as "a clear-cut and discernible counteraction taken by a competing firm with regard to one or more competitors to defend or improve its position" (Smith *et al.*, 1991). In a seminal study, Smith *et al.* (1991) argued that the type of action to which a focal firm is responding to, as well the information processing characteristics of the focal firm affect the likelihood that the focal firm will respond to an initial competitive action by its rival. Of particular interest, they focused on two organizational informational processing characteristics: sensory systems and information processing/analyzing mechanisms. Sensory systems refer to a firm's internal systems that track competitive activity in the external environment. A precondition for response is the realization that an initial attack has occurred (Smith *et al.*, 1991). Firms with an external orientation may acquire information sooner, gather a richer array of information, and have a greater capacity to correctly interpret this information (Aldrich, 1979). Smith *et al.* (1991) posit that an external orientation is positively related to the likelihood of response and empirically substantiate this relationship. Information processing/analyzing mechanisms are the means by which firms transfer information from their external environment to the decision-maker and back to the decision implementers. With regard to information processing/analyzing mechanisms, Smith *et al.* (1991) examined the role of organizational complexity. As organizational complexity increases, as with greater hierarchy and more departments, it becomes more difficult to transfer information without distortion (Aldrich, 1979).

Later works in the area of inter-firm rivalry focus on the role of 'visibility of attack' as a predictor of competitive response. Visibility refers to the level of publicity associated with an attack. The more visible an attack, the higher the likelihood that it will be detected and responded to (Chen *et al.*, 1994). Firms are more likely to be aware of competitive attacks that occur in their strategically important markets (Chen *et al.*, 1992).

The expectancy-valence model developed by Chen *et al.* (1994) concisely summarizes many of these relationships. In this model, the likelihood of response is shaped by: (1) the visibility of the attack, (2) valence - the value of the market at stake, and (3) expectancy, or the ability of the focal firm to successfully respond to an attack. With regard to inter-firm rivalry, this paper argues that a user's satisfaction with his/her firm's information system significantly affects: (1) the ability of the firm to launch a competitive attack that minimizes retaliatory response and (2) the firm's ability to sense a rival's competitive attack and quickly respond to that attack.

Integrating IS Success and Inter-Firm Rivalry

A competitive action can be categorized as either tactical or strategic in nature (Porter, 1980). Whereas tactics are employed for the purpose of short-term gain, strategic actions are primarily concerned with the generation of sustainable competitive advantage. The resource-based theory of the firm holds that sustainable competitive advantage results from: (1) the use of rare and valuable resources, (2) actions that cannot be easily imitated or rendered valueless through substitution (Barney,

1986). As compared to tactical actions, strategic actions may involve more valuable firm resources or a more significant commitment of a firm's overall resources (Grant, 2002). Consequently, strategic actions are complex in nature, and are not easily reversed.

A strategic action may be decomposed into a set of strategic decisions (Iaquinto *et al.*, 1997). Comprehensiveness is often cited as a critical component of the strategic decision-making process (Fredrickson, 1984). Fredrickson and Mitchell (1984, p. 401) defined comprehensiveness as, "the extent to which organizations attempt to be exhaustive or inclusive in making and integrating strategic decisions". Citing Janis and Mann (1977), Fredrickson and Mitchell (1984, p. 401) further characterized decision-making comprehensiveness as, "the thorough canvassing of a wide range of alternatives, surveying a full range of objectives, carefully weighing the risks of various consequences, intensely searching for information to evaluate alternative actions, objectively evaluating information or expert judgment regarding alternative actions, reexamining the positive and negative consequences of all known alternatives, and making detailed plans". An information system may enhance the extensiveness of the environmental search process, facilitating exhaustive analysis within the context of the situation diagnosis, alternative generation, alternative evaluation, and decision integration phases of the strategic decision-making process (Fredrickson *et al.*, 1984).

In terms of competitive behavior, prior research has shown that characteristics of competitive action influence the likelihood of response. Specifically, Chen and Miller (1994) found the competitive actions characterized by a high level of visibility were met with a larger number of retaliatory responses as compared to attacks covert in nature. The same study also noted that attacks on markets especially important to potential responders were more likely to provoke response. As such, firms initiating competitive actions are well advised to covertly attack rivals' markets of minimal importance in order to avoid retaliation.

An information system that supports the decision-making process may improve the likelihood that a strategic action will be successful. By improving the level of comprehensiveness of the decision-making process that underlies a strategic action, an information system may act to improve the effectiveness of the resulting strategic action. Specifically, an IS can provide access to accurate and timely competitive information, focus the user on the most relevant competitive information such that cognitive overhead is minimized, and aid in the evaluation of alternative actions through the use of computer simulations and other heuristic-based programs such that the likelihood of a rival's response might be anticipated. In particular, IS decision support may facilitate the formulation of complex competitive actions that inhibit retaliatory responses from rivals. *As such, this research asserts that decision support satisfaction is positively related to the effective execution of strategic action.*

In order to fashion a response to tactical competitive action, the initial attack must first be detected. Hence, the detection of a competitive move is paramount to the speed and quality of a retaliatory response (Smith *et al.*, 1991). In a firm stratification schema, Miles and Snow (1978) described prospectors as firms having a strong orientation toward environmental openness and change. Firms with an external orientation are more likely to sense a rival's actions as compared to those with an internal orientation. In addition, firms with an external orientation are better positioned to interpret competitive information (Smith *et al.*, 1991). Because externally oriented firms have a greater exposure to a richer array of competitive information, these firms are more capable of developing, analyzing, and evaluating response options (Aldrich, 1979). Smith *et al.* (1991) posited that an external orientation is positively related to a firm's ability to quickly respond to a competitive attack.

To facilitate an effective competitive response, competitive information must be transferred from the external environment to those that can craft and implement a competitive response (Smith *et al.*, 1991). Especially in large, complex organizations, information systems may speed the transfer and analysis of competitive information (Smith *et al.*, 1991). In the SISS model, the ability of an IS to aid a user in the efficient execution of current tasks is manifested within the task support satisfaction construct. Information systems that provide high levels of task support facilitate the flow of competitive information to the relevant decision-makers and response implementers such that a tactical response can be rapidly executed. *As such, this research posits a positive relationship between task support satisfaction and effective tactical response.*

DISCUSSION

The merit of this model may be highlighted by contrasting it to other contemporary models of user satisfaction found within the MIS body of literature. Drawing from the literature review conducted by DeLone and McLean (2003, p. 14), this brief discussion contrasts the user satisfaction-based IS success model developed herein to alternate models that relate user satisfaction to firm performance.

In a macro-level study, Gelderman (1998) investigated the relationship between user satisfaction and multiple measures of firm performance. Adopting validated measures of user satisfaction, Gelderman found that IS success was significantly correlated with multiple measures of firm performance. As such, Gelderman's study provides initial support for the relationship between user satisfaction and firm performance.

In their study of expert systems, Yoon *et al.* (1998) developed an IS success model in which user satisfaction was related to business process reengineering (BPR) benefits. In particular, this study examined the degree to which higher levels of user satisfaction were associated with more simplified business processes, enhanced benefits, and reduced costs. Results from their empirical study showed that IS user satisfaction was positively and significantly related to the perceived benefits derived from expert systems within the context of BPR. Through their study, Yoon *et al.* (1998) developed and substantiated a model that related user satisfaction with expert systems to business performance.

In comparison to the aforementioned studies, this paper proposes a finer-grained conceptual model that disaggregates user satisfaction into two components: decision support satisfaction and task support satisfaction. Whereas the study performed by Yoon *et al.* (1998) focused on the relationship between user satisfaction and business performance within the context of business process reengineering, this paper advances the study of user satisfaction within the context of inter-firm rivalry.

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