Modeling the Development and Use of Strategic Information Systems

FRANCIS D. TUGGLE
American University

H. ALBERT NAPIER
Rice University

The successful adoption of a strategic information system (SIS) is shown to hinge upon a favorable decision to develop a SIS and on a favorable decision to use the developed SIS. A model is exhibited that integrates the factors that lie behind these two separable but linked decisions, and the model receives preliminary explication. The model organizes concisely much of the relevant research literature. Two case studies, one of a successful adoption decision and one for which a SIS has not been well received by the marketplace, provide an initial corroboration of the model.

Information technology (IT) opens up many new avenues for organizations to gain and sustain competitive advantage over their rivals. One type of IT application that may be particularly useful to many types of organizations is the Strategic Information System (SIS— for the plural we shall use SISs). Wiseman (1988) has defined a SIS as an information system that (1) enhances a firm’s accomplishment of its strategy, (2) assists the firm in gaining or maintaining a competitive advantage over its rivals, or (3) reduces the competitive advantage rivals hold in the marketplace. A competitive advantage is some feature of a firm or its products, processes or services that allows the firm to satisfy marketplace needs more effectively or efficiently than its competitors (Gerstein and Resiman, 1982). At their best, SISs confer significant marketplace advantages to firms that use them. However, not all those firms that have developed SISs have an equally impressive record with their deployment and subsequent marketplace acceptance.

The focus of this paper is on the creation of a preliminary model for the development and use of a SIS. The model is composed of two submodels related to the decisions that lie behind the development and deployment of SISs.

Strategic Information Systems

SIS and Corporate Strategy

According to Wiseman (1988), there are five major methods for attaining competitive advantage through a SIS: (1) developing a differentiated product, service, or image for the firm; (2) reducing costs; (3) creating innovative products or processes; (4) permitting growth in products or functions; and (5) facilitating alliances
with other organizations. This theory of SIS is closely tied to Porter’s (1980, 1985) theories of the manner in which firms develop competitive advantage in an industry structure.

Bakos and Treacy (1986) offer an alternative conceptualization of the ways in which competitive advantage may be attained through SISs. In their model, competitive advantage is a function of bargaining power and comparative efficiency. In turn, bargaining power is determined by search-related costs, unique product features, and switching costs. Comparative efficiency is the result of internal efficiency and inter-organizational efficiency. All of these attributes may be realizable through a SIS.

Reynolds (1989) notes there are two different ways of utilizing IT to have a strategic impact upon a company. One route, which he calls the “glamorous” approach, is to develop a “new and dramatically better solution to a business problem—a solution that would not be available without [IT]” (p. 87). The other route is for an organization to utilize existing IT more effectively than its competitors. This approach calls for an organization to recognize the important difference between a better strategic plan than one’s competitors versus better execution of a given strategic plan than one’s competitors. In short, having a SIS is no guarantee of marketplace success, nor is lacking a SIS a guarantee of failure. However, the extant literature suggests that companies can shift the odds of market success in their favor to the extent that they design and use a SIS in harmony with company strengths and weaknesses and to the extent that the SIS responds to market conditions.

Vitale (1986) considers the opportunities a SIS offers from the point of view of the risks entailed in realizing the opportunities. For example, SISs change the basis of competition, but the ultimate impact of a changed marketplace may not always be in the firm’s favor. SISs raise entry barriers, but in so doing, the firm may “...become vulnerable to established organizations with underutilized IS resources” (p. 329). SISs increase the switching costs of customers, but may do so as to attract attention from governmental regulators. SISs may balance out the power relationships among firms and their suppliers and customers, but they may also enable their suppliers and customers to get along without them. Finally, SISs permit the development of new products, but in so doing the firm may divert “...money and management attention from the company’s main line of business” (p. 331).

SIS Examples

There are a plethora of instances of successful deployment of SISs; Wiseman (1988) literally has a book full of such cases. But in line with Reynolds’ (1989) observations, it is instructive to note that SISs perseither are a panacea nor are they foolproof. Culpan (1987, p. 17) remarks that “...frank presentation of unsuccessful cases, with an explanation of the reasons for failure, will be educational.” We add that the education will be more fruitful if the lessons are drawn together into a coherent model; such a model receives initial explication in the next section.

In the studies of IT failure, one of the earliest systematic studies was that of Lucas (1975), who tested a model of information system use that included key variables of a social and interpersonal nature, in addition to expected variables relating to technical features of the system. ZapMail (Gibson, 1986) is claimed by Wiseman (1988, p. 247) to have failed because of insufficient demand, its unreliable technology, cost problems, and competitor problems. Zweig (1986) reported that a joint venture between Citicorp and McGraw-Hill failed because of a lack of a market for the system. Girishankar (1987) found a similar reason for the failure of Sharetech, developed by AT&T and United Technologies—tenants of buildings just did not value the advantages offered by shared services. Louzoun (1987) noted the dissolution of Imnet, a stock quoting service developed by IBM and Merrill Lynch, due to its costs, its pricing, and customer reluctance to purchase services from a competitor. Finally, the Justice Department enjoined the merger of American Airlines SABRE seat reservation system with Datasa similar system offered by Delta Airlines, on the grounds that the combined system would be so successful that a serious restraint of trade could result.

A Model of SIS Development and Use

The Decisions to Develop and to Use a SIS

Our model posits that the decisions to develop and to use a SIS are separable but linked. This is consistent with the view of Gerstein and Reisman (1982) that DP “suppliers” and line management “customers” have sufficiently different interests that there is often a “value conflict” between the two. Our model presumes that a SIS is developed either by an outside vendor or group within an organization. In either case, a decision is made to develop the SIS on the grounds that it can be sold successfully in the marketplace (in the case of an outside vendor) or within the organization.
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