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December 2001

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EC STRATEGY GENERATOR: A TOOL TO FORMULATE A FIRM'S EC STRATEGY

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Abstract

Wiseman's strategic option generator has been significant for its ability to identify a firm's strategic information systems opportunities. Since the conceptualization of Wiseman's tool fifteen years ago, information technology has undergone drastic transformation and new IS concepts have emerged. In the context of electronic commerce (EC), using the ECIS framework as our basis, Wiseman's tool has been modified into EC strategy generator.

Introduction

One of the strategic roles of information systems is securing competitive advantage. A competitive advantage is realized when a firm increases its market share, gains new customers, improves customer loyalty, achieves lower costs of production, or succeeds with new products and services (Neumann, 1994). To achieve such goals, an organization needs to have appropriate business strategy and a matching IS strategy in place.

Firms embarking on electronic commerce (EC) will employ a set of information systems with many of them possessing interorganizational and strategic features. We call such a set electronic commerce information systems (ECIS). To the extent a firm's ECIS are strategic, the firm can alter the way it competes, particularly in the electronic marketplace. The firm may also reap benefits from innovative products and processes. A firm's ECIS will not automatically confer competitive advantage on the firm. A firm must develop and deploy its ECIS consistently with its organizational EC strategy. This requirement implies that a firm must develop a sound EC strategy prior to embarking on EC.

Wiseman's (1985, p. 57) strategic option generator has proven a popular tool in identifying strategic opportunities for a firm. Callon (1996) demonstrates its use in evaluating organizations that have successfully used information systems to gain competitive advantage. We adapt the strategic option generator in the context of EC and offer a tool for development of organizational EC strategy. In developing the tool, we use the ECIS framework (Raghunathan and Madey, 1999) as a building block.

Significance of Organizational EC Strategy

The EC environment is conducive to strategic alliances (Fenn, 1997; Thorp, 1998, Zimmerman, 2000). It is also leading to a global network of organizations with IT capabilities to couple and decouple from the network of knowledge nodes as needed (Jarvenpaa & Ives, 1994). Traditional forms of marketing and selling do not automatically succeed in such an environment (Cronin, 1995). Embarking on EC is just not duplicating a physical store online. Such a narrow visualization does not take advantage of the Web's vast potential for personalization, customization, targeted marketing, and flexible inventory offerings (Machlis, 1998).

As transformational technologies (Jarvenpaa and Ives, 1996), the Internet and the Web offer firms with new business opportunities for strategic advantage. However, in the electronic marketplace, firms are not capitalizing on new opportunities (Baker et al., 2001). One plausible reason is lack of EC strategy. A firm's EC strategy has a major role in planning the firm's ECIS and can alter the basis of competition and support the firm's choice of its business processes (Ghosh, 1998). A firm's EC strategy must be capable of creating business changes in addition to adapting to market changes for achieving success on the Web (Schwartz,

1997). The few winners in the electronic marketplace demonstrate how to garner and exploit immense knowledge gained through the Internet to reshape their business processes (Aufriter, 2001).

Porter and Millar (1985) recognize and advocate strategic use of IT and IS by a firm to gain competitive advantage. Earl (1996) recommends an exact fit among a firm's business, IS, IT and information management strategies. Firms need to know how important it is to plan ahead for EC and what it is they want to do on the Web (Tucker, 1997) and additionally, they need to know how it is to be done, which is precisely what EC strategy is about.

Wiseman's Strategic Option Generator

The strategic option generator (Figure 1) is a conceptual instrument that can be used to identify strategic information systems (Wiseman, 1985). Callon (1997) affirms that this instrument additionally supports:
- Identification of business opportunities that involve the use of strategic information systems
- Evaluation of organizations that have successfully employed information systems to gain competitive advantage.

What is the strategic target?				
Supplier		Customer		Competitor
What is the strategic thrust?				
Differentiation	Cost	Innovation	Growth	Alliance
What is the mode?				
Offensive		Defensive		
What is the direction?				
Use		Provide		

Figure 1. Strategic Option Generator (Adapted from Wiseman, 1985, p. 57)

Wiseman (1985) designed his instrument using the theory of strategic thrusts. This instrument has four layers named strategic target, strategic thrust, mode and direction. The theory of strategic thrust identifies differentiation, cost, innovation, growth and alliance as the five major strategic thrusts. Firms employ these thrusts singly or in combination to gain competitive advantage. A firm can choose to employ its select strategic thrusts offensively or defensively. The chosen strategic thrusts are supported or shaped by a firm's information systems that are aimed at specific strategic targets. These strategic targets are broadly classified as suppliers, customers, and competitors. A firm realizes competitive advantage when its strategic targets are correctly selected and appropriate strategic thrusts are used to attack these targets successfully. The direction of the strategic thrust indicates whether the supporting information systems are for internal use or for sharing with external entities. A strategic option arises with each specific combination of one element from each of the four layers in Wiseman's tool. Mathematically, the tool can generate up to 60 different generic options to be examined by a firm in its search for strategic opportunities to use information systems. Bergeron et al. (1991) undertook an empirical study to investigate managerial preferences of methodologies to identify strategic information systems opportunities. They found that firms in stable environments adopted Porter's value chain methodology to gain competitive advantage by focusing on changes in internal mechanisms. On the other hand, firms in volatile environments preferred to apply strategic thrust methodology in identifying strategic options to achieve competitive advantage. With EC technology becoming more powerful with each passing day, and with global competition intensifying through new entrants, the EC environment is definitely not stable. Therefore, the strategic option generator is an appropriate starting point in our quest for a new tool to support a firm in formulating its EC strategy.

Wiseman's strategic option generator was designed before the adoption of electronic data interchange and EC on a sizeable scale. In the intervening period, new concepts associated with the domain of IS have emerged. Interorganizational systems, business processes reengineering, process innovation, employee empowerment, virtual corporation, knowledge management and competitor networking are a few such concepts. While the underlying structure of the strategic option generator can serve as the springboard to develop a new tool, the different elements in each layer of Wiseman's instrument need rethinking and reevaluation. A new tool that integrates recent concepts and impacts of emerging technologies can support firms embarking on EC in identifying their EC strategy options.

The Firm-Level Framework for ECIS Planning

The EC environment is conspicuous for global competition, rapidly changing technology, emergence of new products/services, and customer orientation. In such an environment, ECIS planning is a complex process. The availability of a firm-level framework for ECIS planning enhances the quality of the planning process. In this section, we introduce the ECIS framework (Raghunathan and Madey, 1999).

The components of the firm-level framework for ECIS planning are graphically depicted in Figure 2. The framework has six components:

- Organizational EC strategy development
- Business processes transformation
- Information technology management
- Information management
- Customer management
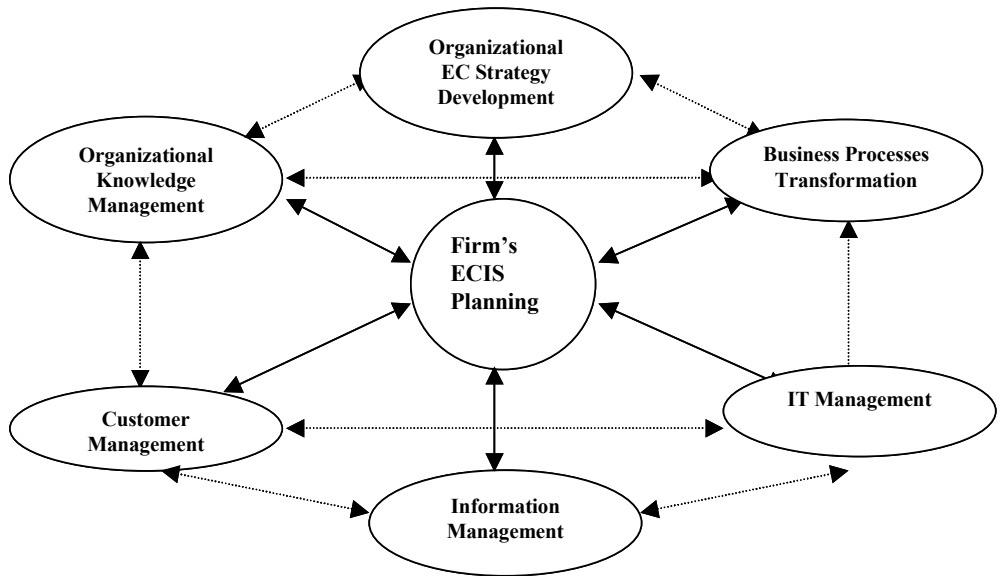- Organizational knowledge management

Organizational EC strategy, derived from the business strategy, directs a firm's choice of its business processes. These business processes are supported and even transformed by strategic decisions based on the firm's organizational knowledge and information bases. Organizational knowledge manage-

Figure 2. The ECIS Framework for Planning a Firm's ECIS

ment and information management are accomplished through effective IT management. The business processes create output of value to the firm's customers. The above perspective covers the entire business and provides the underlying rationale for inclusion of the six components in this framework. Any business issue falls within the scope of one or more of the six components. While the components form a fairly comprehensive set, they do not form a mutually exclusive set. It is appropriately so in the complex business environment of global EC. Each of the components has a long-term relevance to a firm embarking on EC. The cumulative long-term relevance of the six components translates into the long-term relevance of the framework. For more detailed discussion on the conceptualization of the ECIS framework, see Raghunathan and Madey (1999).

The EC Strategy Generator

The EC strategy generator, a conceptual tool has three layers named strategic component, strategic value, and mode (Figure 3). These three layers correspond to the first three layers of Wiseman's instrument. The elements included in the top layer of strategic component are organizational knowledge management, customer management, information management, IT management, and business processes management. These components have been drawn from the ECIS framework (Figure 2). The elements of the second layer of strategic value are differentiation, cost, innovation, growth, and alliance. They match with the elements of the second layer of Wiseman's tool. The elements of the third layer of mode in the new tool are "abrupt" and "incremental." The fourth layer of direction in Wiseman's tool is not included in our new tool based on analytical considerations.

In the context of EC, there is scope for unlimited suppliers and customers. EC has the ability to support rapid formation of virtual corporations that assemble for short periods of time to achieve some time-constrained common goals and dissolve immediately thereafter. Such corporate shifts may cause disintegration of traditional relationships with tightly coupled suppliers.

What is the strategic component?				
Organizational knowledge management	Customer management	Information management	IT management	Business processes transformation
What is the strategic value?				
Differentiation	Cost	Innovation	Growth	Alliance
What is the mode?				
Abrupt		Incremental		

Figure 3. EC Strategy Generator

EC sparks innovation and global competition. Often, competition emerges from unexpected quarters and in the guise of new products/services. Competition can take the shape of strategic alliances that transcend national boundaries and geographic barriers. EC will also provide opportunities to competitors to engage in competition and cooperation at the same time.

Customers may be globally distributed and belong to different cultures. Customers continually crave for new products and services, and demand a lot more from businesses. The concept of mass customization is receiving an accelerated response through EC. In such a scenario, firms need to learn new forms of market segmentation, and new methods for building customer bases.

Wiseman's tool lists the elements of its first layer as "targets of attack." In the context of EC, it may not be appropriate to perceive suppliers, competitors, and customers as such. First, as pointed out earlier, these targets may not be readily identifiable in the EC environment. Second, the classification of the participants in a firm's business transactions into three watertight categories of suppliers, customers, and competitors may not be feasible. Far from being just suppliers, many of these participants may turn into new sources of competition. Again, far from being just competitors, many of them may turn into limited allies with some limited common goals. Such outcomes are quite probable when some value chains in a value system are usurped, or replaced by new ones (Ghosh, 1998).

We conclude that the elements of the first layer of Wiseman's strategic option generator may not be adequate in the context of the development of a firm's EC strategy. Therefore, we replace the first layer of Wiseman's tool with the layer of strategic components (Figure 3) drawn from the ECIS framework (Figure 2). Moreover, we do not view the elements in this segment as targets of attack by a firm's ECIS. The components of the ECIS framework are comprehensive in covering all aspects of a business. Every firm has its own unique characteristics, strengths, and weaknesses. The strategic component of one firm, therefore, is likely to be different from that of another. How different firms could perceive different components as strategic is illustrated in Table 1.

Table 1. Strategic Component of a Firm

Business	Example	Strategic Component
Consulting	Anderson Consulting	Organizational knowledge management
Credit card	Citibank	Information management
Retailer of books	Amazon.com	Customer management
Internet Service Provider	America OnLine	Information technology management
Transportation of packages	UPS	Business processes transformation

The first layer in Figure 3 helps a firm in identifying the strategic component of the ECIS framework and in focusing the firm's EC strategy on that component. Depending on the individual firm's business model and its unique characteristics, a firm may identify more than one strategic component. For FedEx, with its commitment of dependable overnight delivery (FedEx, 2001), both business process transformation and customer management are strategic components of the ECIS framework.

In our tool, we prefer to call the second layer as strategic value instead of strategic thrust. 'Strategic value' brings out clearly the important premise of value creation through EC strategy. The layer of strategic value, however, retains all the elements of the second layer of Wiseman's tool. Each one of these elements – differentiation, cost, innovation, growth, and alliance – is capable of creating value to participants in the business processes of a firm.

The firm's ECIS applications translate the firm's EC strategy into its EC goals. As IS applications support a firm's transactions, processes and activities that are value-based, the firm's EC strategy must be oriented to value creation or augmentation. For that reason, we recognize that EC strategy options generated in this segment need to be evaluated for their ability to create or augment value.

Since our new tool is not developed with the focus of target and thrust, we prefer our elements in the third layer to be depicted as "abrupt" and "incremental" instead of "offensive" and "defensive." A firm's EC strategy and characteristics determine whether its ECIS need to be implemented abruptly or incrementally. This decision is also a part of the firm's EC strategy. Dell Computer pursued an incremental path in extending its Internet operations. On the other hand, E*Trade's approach can be classified under "abrupt" (E*Trade, 2001). In general, start-up firms tend to take an "abrupt" approach while established businesses tend to choose an "incremental" approach.

Wiseman's tool includes a fourth layer of "direction." It gives an impression that a strategic option leads to an information system either for internal use or for sharing with external entities. In reality, most ECIS will likely be interorganizational and strategic. These systems may have the potential to interact with unlimited customers, intermediaries and suppliers, and most likely serve both internal and external users. Hence, we exclude a fourth layer of "direction" in our new tool.

In applying the EC strategy generator to formulate its EC strategy, a firm may undertake a variety of activities such as:
- Help the planning teams understand the concepts of the EC strategy generator through appropriate training
- Undertake case studies to understand the process of EC strategy formulation
- Brainstorm to identify the strategic component(s) based on the ECIS framework, and to generate EC strategy options that create or augment value
- Discuss, evaluate and select the EC strategy.
- The above activities are not intended as mandatory, but as useful suggestions. Our suggestions are similar to the steps employed by GTE in applying the strategic option generator (Rackoff et al., 1985).

Analyzing Select Firms Using the EC Strategy Generator

The EC strategy generator has to be applied in a firm-specific context. The following two illustrations demonstrate the tool's use in analyzing firms that are already engaged in EC operations. The analysis is not intended to be comprehensive, but to demonstrate the scope of the tool.

For Encyclopaedia Britannica, the strategic component is information management (Figure 4). Encyclopaedia Britannica has accumulated a vast amount of information, has in place a network of reliable sources to gather information, and has developed an expertise in information presentation. Encyclopaedia Britannica creates value through "differentiation" and "cost" (Encyclopaedia Britannica, 2001). On the Internet, Encyclopaedia Britannica offers several online and physical products of superior quality. The value of many of these products is enhanced through multimedia capabilities and hyperlinks to other reliable information sources. Encyclopaedia Britannica recognizes that cost to customers is an important consideration especially after the erosion of its market for its print product. Encyclopaedia Britannica's pricing strategy attracts and serves different market segments on the Web. Furthermore, Encyclopaedia Britannica has found several strategic partners on the Web. Because of the rapid erosion of its market for the print products, Encyclopaedia Britannica had to engage in abrupt implementation of its EC strategy.

What is the strategic component?				
Organizational knowledge management	Customer management	Information management	IT management	Business processes transformation
What is the strategic value?				
Differentiation	Cost	Innovation	Growth	Alliance
What is the mode?				
Abrupt			Incremental	

Figure 4. EC Strategy Generator – Analysis of Encyclopaedia Britannica

Dell Computer has been successful with its direct business model of no wholesalers and no retailers (Dell Computer Corporation, 2001). The firm received orders over the telephone and built systems to customer's configuration. Mass customization and prompt service enabled the firm to achieve a remarkable growth. Dell Computer's strategic component is customer management (Figure 5). When the firm extended its operations over the Internet, its EC strategy needed to focus on customer management. Its EC strategy for augmenting value comes from its attention to cost, innovation and growth.

The firm's deft inventory management offers definite cost advantages. The Dell Computer's web site is carefully and innovatively designed to provide maximum support for online ordering, order tracking, and customer service to its customers in different market segments. As the firm was a market leader with secure market position, it implemented its EC strategy in an incremental fashion.

What is the strategic component?				
Organizational knowledge management	Customer management	Information management	IT management	Business processes transformation
What is the strategic value?				
Differentiation	Cost	Innovation	Growth	Alliance
What is the mode?				
Abrupt	Incremental			

Figure 5. EC Strategy Generator – Analysis of Dell Computer Corporation

Conclusions

Wiseman's strategic option generator has been successfully used in the past to identify strategic information systems opportunities. Since the conceptualization of that tool about 15 years ago, new concepts in IS and related domains that are relevant to EC and ECIS have emerged. It is in this context that the strategic option generator is modified into a new tool, the EC strategy generator. The evolution of the new tool is additionally based on the ECIS framework that was developed incorporating many recent concepts and theories in IS and related areas. Analytical reasoning supports the changes made to Wiseman's tool.

References

Aufreiter, N., Quillet, P., & Scott, M. "Marketing rules," *Harvard Business Review* (79:2), 2001, pp. 30-31.

Baker, W., Marn, M., & Zawada, C. "Price smarter on the Net," *Harvard Business Review*, (79:2), 2001, pp. 122-127.

Bergeron, F., Buteau, C., & Raymond, L. " Identification of strategic information opportunities: Applying and comparing two methodologies," *MIS Quarterly* (15:1), 1991, pp. 89-103.

Callon, J.D. *Competitive Advantage through Information Technology*, New York: McGraw-Hill, 1996.

Cronin, M.J. *Doing More Business on the Internet: How the Electronic Highways Transforming American Companies*, New York: Van Norstrand Reinhold. 1995.

Dell Computer Corporation. "dell.com home page," *http://www.dell.com/*, 2001.

Earl, M.J. "Integrating IS and the organization: A framework of organizational fit," In M.J. Earl (Ed.), *Information Management: The Organizational Dimension*, New York: Oxford University Press, 1996, pp. 485-502.

Encyclopaedia Britannica. "Encyclopaedia Britannica online," *http://www.eb.com/about/*, 2001.

E*Trade. "Welcome to E*TRADE," *http://etrade.com/cgi-bin/gx.cgi/AppLogic%2bHome*, 2001.

FedEx. "FedEx home page," *http://www.fedex.com/*, 2001.

Fenn, D. "Sleeping with the enemy," *Inc*. (19:1), 1997, pp.78-88.

Ghosh, S. "Making business sense of the Internet," *Harvard Business Review* (76:2), 1998, pp. 126-135.

Jarvenpaa, S.L., & Ives, B. "The global network organization of the future: Information management opportunities and challenges," *Journal of Management Information Systems* (10:4), 1994, pp. 25-57.

Jarvenpaa, S.L., & Ives, B. "Introducing transformational information technologies: The case of the world wide web technology," *International Journal of Electronic Commerce* (1:1), 1996, pp. 95-126.

Machlis, S. "Outdoor goods seller creates online outlet," *Computerworld* (32:50), 1998, pp. 51-52.

Neumann, S. *Strategic Information Systems: Competition Through Information Technologies*, New York: Macmillan College Publishing Company, 1994.

Porter, M.E., & Millar, V.E. "How information gives you competitive Advantage?" *Harvard Business Review* (63:4), 1985, pp. 49-160.

Rackoff, N., Wiseman, C., & Ullrich, W.A. "Information systems for competitive advantage: Implementation of a planning process," *MIS Quarterly* (9:4), 1985, pp. 285-294.

Raghunathan, M., & Madey, G.R. "A firm-level framework for planning electronic commerce information systems infrastructure," *International Journal of Electronic Commerce* (4:1), 1999, pp. 121-145.

Schwartz, E.I. *Webonomics*, New York: Broadway Books, 1997.

Thorp, J. *The Information Paradox: Realizing the Business Benefits of Information Technology*, New York: McGraw-Hill, 1998.

Tucker, M.J. "Web servers tuned for e-commerce," *Datamation* (43:2), 1997, pp. 92-98.

Wiseman, C. *Strategy and Computers: Information Systems as Competitive Weapons*, Homewood, IL: Dow Jones-Irwin, 1985.

Zimmerman, C. "Partnerships are vital to Sears' Web strategy – Spin-off sites complement internal efforts in helping retailer freshen its image," *Internetweek*, June 12, 2001, pp. 77-80.