

Association for Information Systems AIS Electronic Library (AISeL)

AMCIS 1997 Proceedings

Americas Conference on Information Systems
(AMCIS)

8-15-1997

A Firm Level Framework for Electronic Commerce: An Information Systems Perspective

Madhav Raghunathan

Kent State University, mraghuna@cc.ysu.edu

Greg R. Madey

Kent State University, gmadey@dendrite.kent.edu

Follow this and additional works at: <http://aisel.aisnet.org/amcis1997>

Recommended Citation

Raghunathan, Madhav and Madey, Greg R., "A Firm Level Framework for Electronic Commerce: An Information Systems Perspective" (1997). *AMCIS 1997 Proceedings*. 12.

<http://aisel.aisnet.org/amcis1997/12>

This material is brought to you by the Americas Conference on Information Systems (AMCIS) at AIS Electronic Library (AISeL). It has been accepted for inclusion in AMCIS 1997 Proceedings by an authorized administrator of AIS Electronic Library (AISeL). For more information, please contact elibrary@aisnet.org.

A Firm Level Framework for Electronic Commerce: An Information Systems Perspective

[Madhav Raghunathan](#) and [Greg R. Madey](#)

Department of Administrative Sciences

College of Business Administration

Kent State University

Kent, Ohio 44240

(mraghuna@cc.ysu.edu and gmadey@dendrite.kent.edu)

Abstract

Many firms do not have their business plans and information systems plans in place for embarking on electronic commerce. A firm level framework for electronic commerce will help firms to plan and align their ECIS (Electronic Commerce Information Systems) to business and information systems strategies. This paper develops such a framework. The four components of the framework are information architecture, business processes, choice of technology applications, and customer focus. A brief discussion on the significance of these components to electronic commerce is included.

1. The Need For A Firm Level Framework For Electronic Commerce

Very few firms develop a business plan to help them make critical decisions on their entry into electronic commerce (Angell, 1996). Yoffie (1996) advances a similar view that most firms do not develop a business model for creating a sustainable competitive advantage with the support of digital technologies. Even big corporations fail in planning their information systems (IS) infrastructure for electronic commerce (EC). Wal Mart encountered operational snags in its retail transactions on the World Wide Web (WWW or the Web) on the first day of implementation (Wagner, 1996).

Several academicians and professionals have observed that IT planning (not necessarily in the context of EC) has been haphazard across most industries and organizations due to lack of appropriate framework. Keen (1991) observes that corporate investments in IT have been growing and at the same time, corporate doubts about benefits from such investments continue to haunt decision-makers. He attributes this anomaly to the lack of an economic IT framework. EC will involve information systems that are interorganizational, strategic or both. Neumann (1994) considers IS frameworks as strategically important for analyzing the complex and dynamic challenges faced by a business. Davenport (1993) argues that a framework based on process innovation (PI) concepts is a necessary tool to maximize the impacts of IT in order to achieve the planned economic outcome.

Computer and telecommunications technologies have radically altered the competition in most industries with fundamental changes in the structure of the industries and their markets (Steffens, 1994). An analytical framework offers an overview of the relationship between technological change and competitive behavior, their interaction on the industry, and market structures and patterns of evolution. The above concept of Steffens is equally applicable to EC because technology is a major driver of EC. Steffens considers the significance of industry-level and market-level impacts, but does not mention the significance of firm-level impacts. Steffens' arguments for an analytical framework for understanding industry-level and market-level impacts of IT can be applied with equal justification to an analytical framework for EC to gain a better understanding of firm-level impacts of EC.

EC is an emerging field under the information systems (IS) area. Academic research on frameworks for EC is sparse. A few frameworks for EC have been developed, but not in the context of an individual firm. For example, Kalakota and Whinston (1996) offer an industry framework. Applegate et al. (1996) suggests a

framework for research in EC. Other frameworks are technology oriented and have limited ability to support a firm's plan for entry into EC.

This paper develops a firm level framework for EC from an information systems perspective. Such a framework provides a platform for firms to analyze the scope for EC opportunities, to reorient their business processes, to plan for an adequate IT infrastructure, and to optimize management of information as a resource.

2. Generic Frameworks

A framework is a conceptual representation in graphical or textual form. It helps structure one's thinking and is useful for understanding a range of concepts (Jayaratna, 1994). A framework, well grounded in established theories and concepts, can serve as a robust decision-making tool for planning an IS infrastructure.

Literature in IS and related areas abound with several frameworks for different purposes. A few of them can be identified as foundation frameworks (Neumann, 1994). These frameworks have generic utility despite passage of time since their enunciation. Thus they are useful for providing insight into important concepts. They also provide a better understanding of the framework development process. These frameworks serve as appropriate models for this study. Porter's industry and comparative analysis (ICA) framework is at the top of such foundation frameworks (Neumann, 1994). It provides managers with a structure for strategic planning. As information plays key roles in these forces (Substitutes, Suppliers, Buyers, Potential New Entrants, and Intra-industry Rivalry), information technology (IT) can be effectively used to control their impact on a firm.

The value chain (Porter and Millar, 1985) serves as an analytical framework in IT context. The value chain of a firm must include only those activities that add value to customers. IT can be effectively employed to strengthen a firm's value chain. The emphasis of the Customer Resource Life Cycle (Ives and Learmonth, 1984) is on the relationship between a firm and its customers. IS can be designed with customer focus to manage every stage of this model. Feeney's (1988) marketing opportunities framework identifies factors in IS support for marketing. IS for managing each of these factors may be distinct. Earl's (1996) organization fit framework (OFF) implies that organizational strategy should be the starting point for developing IS strategy and information management (IM) strategy. These strategies together should lead to the firm's IT strategy. The industry framework for EC by Kalakota and Whinston (1996) addresses critical EC issues at a meta level.

Significantly, no framework developer claims total validation of the framework. The main function of a framework is to serve as an analytical tool that would help managers focus on critical issues related to the theme of the framework. Each of the above frameworks addresses a specific subject such as competition, business processes, customer relationships, and business strategy. Except for one (Kalakota and Whinston, 1996), the other frameworks were developed before the dawn of the Web, which is emerging as a major medium for EC. This study synthesizes concepts from the above frameworks that are relevant and critical in the context of EC. Based on such a synthesis, a firm level framework for EC is developed from an IS perspective.

3. A Framework for Electronic Commerce Information Systems (ECIS)

The firm level framework for EC is shown in Figure 1. Information architecture represents the basis for handling and processing information for both business transactions and communications. Business processes need to be redefined or even reengineered as a firm ventures into EC. The choice of technology applications for EC will be a vital decision consistent with new business processes and the information architecture plan. Customer focus will be a major driver of a firm's strategy for EC. The framework underscores the importance of these four components in planning the ECIS of a firm. A firm can use this framework to identify EC issues by critically analyzing each of these components and the interdependencies among them (as indicated by the double-headed arrows in Figure 1). The significance of

the four components is discussed in the following subsections.

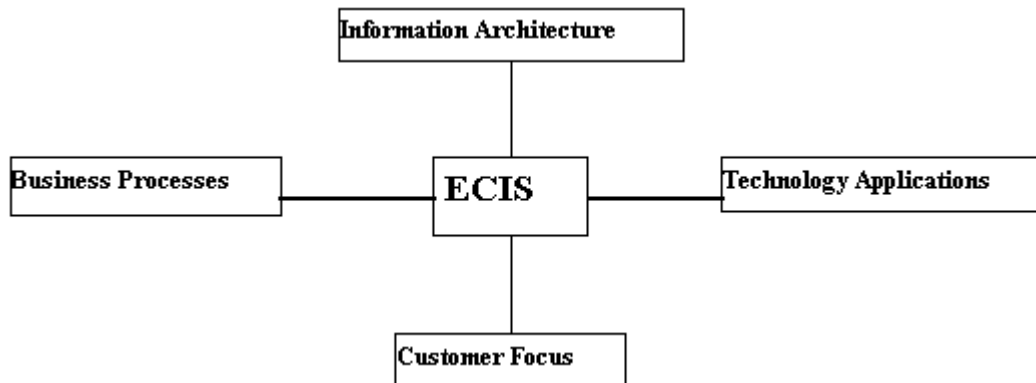


Figure 1. A Firm Level Framework for ECIS

3.1 Information Architecture

The EC environment (including the Internet) poses many challenges to overcome: massive volumes of data, excessive reliance on browsing, unintegrated search

engines, and incompatible information offerings and services. Information architecture deals with database structure and information content in the databases of the organization. Angell (1996) strongly advocates information architecture for content development of business web sites. Brueckner (1996) places the same emphasis on careful design of the web site content. Information architecture will be the basis for managing information as a business resource. It assumes even more significance when the cost of information search is pushed to the customer in the EC environment.

3.2 Business Processes

EC relies heavily on IT and the latter often causes dramatic changes in business processes. IT enhances employee focus on solutions to business problems (Cooper et al., 1996) and changes the locus of knowledge and balance of power in the organization (Benjamin and Blunt, 1996). The essence of strategy lies in performing activities differently or to perform different activities from competitors (Porter, 1996). Since business processes are groups of related business activities, they need to be managed effectively. In the context of EC, restructuring organizational processes will be a major challenge of a firm (Laplante, 1996).

3.3 Choice of Technology Applications

Technology per se is not a solution to management or business problems. Often, the solutions are implemented through appropriate technology applications. Somogyi and Galliers (1994) express their concern that far too much attention is paid to technology and far too little attention to the application of technology. In the EC environment, use of technology without understanding or choosing the right applications can inflict serious damages on the organization's resource management. As an example, EC on the Internet is expected to reach its full potential with the availability of electronic money for business transactions (Washburn, 1996). The choice of technology applications may be critical for monetary transactions and security of transaction.

3.4 Customer Focus

The main significance of EC is its customer reach. Quelch and Klein (1996) identify the drivers of the Internet business models under two factors. The first is primary business impact in the form of cost reduction or revenue generation. The second factor is customer focus (both external and internal). EC has the potential to alter the distribution channels. It may dispense with much of intermediation or may use new forms of intermediation. The goal is to find and serve the ultimate customer. Just as changes in distribution channels occur, EC may lead to drastic changes in product offerings through mass customization. A major challenge is to make customized information available without knowing the customer in advance.

4. Conclusions

In a recent survey of thirty Fortune 1000 companies by Forrester Research, Inc. (Computerworld, 1996), it was reported that all these companies have ongoing Web projects for EC. According to this survey, 1997 will witness significant percentage increases in the number companies using the Web for online transactions (to 73 % from 37% in 1996), for customer service (to 57% from 23% in 1996), and for sharing information (to 70% from 40% in 1996). The above statistics tend to support this study's findings.

A firm level framework for EC with an information systems perspective will have practical utility. It will enable a firm to plan systematically for entry into EC. It will guide the firm to raise vital questions on IT infrastructure needed for such a venture. This conceptual exercise will help academicians focus on issues critical to IS and IT for EC. Conceptual studies lay the foundation for future empirical studies.

The rapid transformation of the economy from a production orientation to an information orientation is a paradigm shift brought about by the phenomenal growth of IT and telecommunications technology, and the convergence of these two technologies in the last decade. This paradigm shift implies that information handling will probably be the dominant driver of EC.

References

References available upon request from:

[Madhav Raghunathan](mailto:raghu@juno.com)
(raghu@juno.com)