

## Association for Information Systems AIS Electronic Library (AISeL)

---

AMCIS 1998 Proceedings

Americas Conference on Information Systems  
(AMCIS)

---

December 1998

# Modeling Electronic Commerce: Key Interorganizational Boundaries

Jonathan Palmer

*University of Maryland College Park*

Follow this and additional works at: <http://aisel.aisnet.org/amcis1998>

---

### Recommended Citation

Palmer, Jonathan, "Modeling Electronic Commerce: Key Interorganizational Boundaries" (1998). *AMCIS 1998 Proceedings*. 108.  
<http://aisel.aisnet.org/amcis1998/108>

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 1998 Proceedings by an authorized administrator of AIS Electronic Library (AISeL). For more information, please contact [elibrary@aisnet.org](mailto:elibrary@aisnet.org).

# Modeling Electronic Commerce: Key Interorganizational Boundaries

Jonathan W. Palmer

University of Maryland, College Park

## Abstract

*This paper presents a market-oriented model of electronic commerce that examines multiple organizational linkages between a firm and its customers, suppliers and business partners. The paper identifies four key linkages: business-to-business, business-to-customer, marketspace, and disintermediation. Benefits, costs, and technologies supporting activities possible in electronic commerce are also discussed.*

## Introduction

The growth of electronic commerce, and a variety of definitions for it, has generated a number of approaches to modeling the design and impact of electronic commerce. Some models are processual and others are more technology based. This paper attempts to bring into focus a business-oriented perspective defining the key boundaries making up the new markets in electronic commerce. The model presented articulates the key boundary relationships and provides examples of technologies to manage these boundary relationships as well as identifying potential costs and benefits.

The virtual value chain has been used by several authors to establish a mechanism for key elements including: manufacturing, inbound and outbound logistics, operations, marketing, sales, and after sales support and service. While these are key elements of the business-to-business and business-to-consumer processes, the linear and static nature of the model fails to account fully for the nature of the World Wide Web. The Porter model (1985), has as its basic assumptions a production capacity of a manufactured good. This is not the underlying assumption of the information-based businesses that most often populate the Internet. This processual model was extended to identify the potential for a virtual value chain (Benjamin and Wigand, 1995). More technology based approaches to modeling electronic commerce include a technology based pyramid (Zwass, 1997) and a set of technological supports and governmental regulations (Kalakota and Whinston, 1996). A new model that can shed additional light on the multiplicity of relationships engendered by the ability to connect suppliers, manufacturers, retailers, and consumers may help in examining EC issues from the perspective of an individual firm.

The issues raised by others researching the Web include the increased level of disintermediation (Hoffman and Novak, 1994), the new marketspace (Rayport and Sviokla, 1995), and the increased availability of new market capabilities (Applegate and Gogan, 1995, Hoffman and Novak, 1994, Cronin, 1994). In addition, there is an issue of changes in interorganizational relationships among those sharing information and transactions on the Internet (Clarke and Lee, 1997). These interorganizational relationships are often the result of new and hybrid relationships (Borys and Jemison, 1989) and involve the issues of trust and boundary management. It is the boundary management element of the relationship that appears to be affected by the electronic medium. The velocity of information increases, the market is open around the clock, and expectations regarding cycle times and the underlying relationships begin to change.

The boundary theoretic approach suggests the overlapping of the boundary space to include multiple interactions from a single company perspective: the business-to-business, business-to-consumer, and the marketspace in which business, partner and consumer connect. Each of these overlaps has its own delicate set of activities and issues. The model emerging from examining these boundaries suggest the diagram presented in Exhibit 1. The model identifies the three boundary management areas and suggests a fourth, the end run or disintermediation that occurs when the company does not even have a role in the boundary or connection between business partners and consumers.

Understanding the capabilities of electronic commerce goes beyond mere Web site design, to a fuller understanding of how electronic commerce plays a role in each of the key boundaries facing a company. Organizationally to concentrate on using the capabilities of electronic commerce to address only one or two of these boundaries, presents a situation in which the company is at risk on any boundary left uncovered. The issues may differ depending on the boundary to be addressed, but the need to include each of the boundaries within the electronic commerce environment seems critical.

## The Model

The model as currently defined provides a useful way to look at the relationships between and among the company, its business partners and its customers. Opportunities for creating value occur at each of the boundaries. Some of these boundaries are better defined and more porous than others. Existing customer and partner relationships are more readily supported and enhanced through the use of the technologies, while generating new customer and partner relationships can be more difficult.

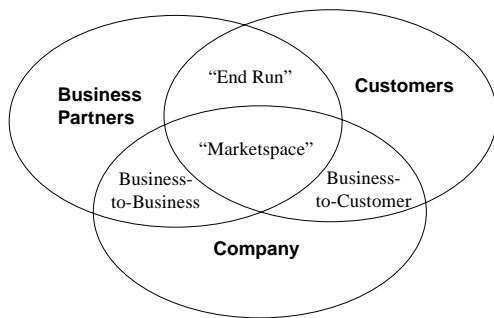
Each of the four basic areas are defined by the boundaries between two or more key players. The model identifies these boundaries and the potential interactions between the players taking place between the potential partners.

The business-to-business space includes the potential for transactional data, logistics information, shared R&D, EDI and EFT, and the opportunity for sharing both tacit and embedded knowledge (Palmer and Johnston, 1996). For example, JC Penney shares packing, shipping, inventory and product movement with suppliers. Phillips Petroleum Company shares product movement trends and forecasts with a pipeline partner.

The business-to-customer space includes ordering product, sharing of product information, display space, defining customer information, co-development of products, and customer service. For instance, Federal Express and UPS provide product-tracking information to end customers. Catalog and in-store retailers provide retail mall space for consumers. GM and Ford show product and information on dealerships, while Dell and Gateway provide product specifications and the ability for consumers to customize configurations.

The marketspace involves the firm, partners and customers. Here the sharing of information can include all of the above, but most likely is limited to information that affects all three of the parties, such as customer demand pull information and the appropriate response data from the firm and its business partners.

The area that is of greatest potential threat to the firm is the “end run” area which connect business partners and customers, without any place for the firm itself. These connections which are selling direct to the customer or buying direct from the manufacturer are a potential risk, particularly as the marketspace makes additional customer-partner contact easier and more likely.



**Figure 1. Electronic Commerce Model**

The information shared across each of these four boundaries ranges from highly specified data interchanges between business partners to highly interactive customer oriented product descriptions and ordering capabilities. The rapidity of information exchange is a benefit across each of the boundary types. Customer are provided a broader array of search capabilities and business partners can react more quickly to market information. Costs include the need to translate data across partners as well as provide transaction and data security. Table 1 captures these dimensions across the four boundary areas.

In analyzing a specific company situation the factors include the number of boundaries and the relative strength of the other players operating on the boundaries. In the model presented, this would be a way to define the scope of the connections with business partners as being quite different from a general consumer interface across all of the potential users of the Internet. These boundaries also differ in how porous they are. This permeability is impacted by

how well the customer or partner is known, levels of trust, and the levels of the importance of the continuity/constancy of the interaction to be supported.

**Table 1. A Comparison of Interorganizational Boundaries**

	Type of information shared	Benefits	Costs
Business-to-business	EDI, EFT, product replenishment	Rapid exchange of information	Translation, security
Business-to-customer	Product description and specification, Order entry	Wider search capability for customer	Staffing 24-hour store front, security
Marketspace	Product development and configuration, Order entry	Rapid sharing of information	Higher coordination
End Run	Direct customer ordering	More rapid delivery Lower costs	Reduced service, Lack of producer access to channels

### Discussion and Implications

The discussion on the use of the Internet and related technologies in support of electronic commerce should be framed by the existing relationships, transactions and levels of interaction can be enabled by the technology and by how the technologies can provide entirely new ways of doing business.

The major impacts continue to be on the procedures and protocols of the systems and the people using them. The appropriate alignment of incentives, the degree of IT sophistication among the organizations, and the existing power positions all play a role in how incentivized or disincentivized the companies may be to participate in or pursue vigorously the opportunities for electronic commerce.

The model identifies opportunities for impact in services and manufacturing, including reduction cycle time for response, improved monitoring of remote operations or processes, and gathering of corporate intelligence. The model suggests an opportunity along each boundary for making value added contributions to the processes, transactions and interactions. The model also suggests potential boundary friction points. As the model rotates, the disintermediation segment becomes either an opportunity or a threat depending on the point of view (e.g. the company’s disintermediation segment includes partners and customers, but not the company which may be seen as an opportunity for both or either the partner or customer).

The model presented here captures the interdependency of relationships and defines key boundaries that must be managed effectively to generate the potential benefits of electronic commerce. It can serve as both a diagnostic and prescriptive tools for company's involved in electronic commerce initiatives.

### *References*

- Applegate, L. and Gogan, J., " Electronic Commerce: Trends and Opportunities," HBS 9-196-006, 1995.
- Benjamin, R. and Wigand, R., "Electronic Markets and Virtual Value Chains on the Information Superhighway," *Sloan Management Review*, Winter 1995.
- Borys, B. and Jemison, D., "Hybrid Arrangements as Strategic Alliances: Theoretical Issues in Organizational Combinations," *Academy of Management Review*. 14:2 (1989), p. 234-249.
- Clarke, T. and Lee, H. G., "Impacts of the Electronic Marketplace on Transaction Cost and Market Structure," *International Journal of Electronic Commerce*, Volume 1, no. 1, Fall 1996: 127-149.
- Cronin, M., *Doing Business on the Internet*, Van Nostrand Reinhold, 1994.
- Hoffman, D. and Novak, T., "Marketing in Hypermedia Computer-Mediated Environment: Conceptual Foundations," *Graduate School of Management Working Paper*, 1994.
- Kalakota, R. and Whinston, A. *Frontiers of Electronic Commerce*. Addison-Wesley, 1996.
- Palmer, J. and Johnston, S., "Business-to-Business Uses of the Internet: New Interorganizational Information Systems," *EM-Electronic Markets*, October 1996. Lead article.
- Porter, M. *Competitive Advantage: Creating and Sustaining Superior Performance*. New York: Free Press; London: Collier Macmillan, 1985.
- Rayport, J. and Sviokla, J., Exploiting the Virtual Value Chain," *Harvard Business Review*, Vol. 73, no. 6, November-December 1995, 75-85.
- Zwass, V., "Electronic Commerce Structures and Issues," *International Journal of Electronic Commerce*, Volume 1, no. 1, Fall 1996, 3-23.