



# The Electronic Commerce Enterprise Environment

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## ABSTRACT

*The Electronic Commerce (EC) enterprise environment includes networks, relationships, and tools. This paper examines how these subjects work together.*

## 1. INTRODUCTION

Electronic Commerce is the sharing of business information, maintaining business relationships, and conducting business by means of telecommunication networks. Principle technologies involved in EC include: telecommunications and networking, client/server technologies, multimedia and hypermedia technologies (WWW), Electronic Data Interchange (EDI), database management systems (DBMS), message handling and work flow management systems, electronic meeting systems, and cryptography ([25]). The first three levels deal with the communications infrastructure. These levels relate to the communication backbone of the system that provides the functionality. The fourth and fifth levels, secure messaging and services, enable a secure means of search, retrieval, and information delivery. These levels include the tools and services needed to conduct the secure communications. The last two levels describe the products and structures. These levels contain the tools that grant the provision of goods and services to consumers and business partners.

## 2. THE NETWORK ENVIRONMENTS

Computer networks are used to support the business operations and must be designed to support the business relationships. The requirements for a successful network system include performance, consistency, flexibility, availability, reliability, recovery, and security [10, 24]. These attributes must be monitored and managed to ensure that the network achieves the prerequisite requirements of the business.

As a company's network expands, the network becomes much more difficult to manage. Topics such as user support, performance, and cost-effectiveness must be constantly maintained, monitored, updated, and planned. Most client/server architectures will expose businesses to distributed environments. Network management becomes even more complex when businesses start dealing with distributed data and replication. For this reason, [7] foresees extensive growth over the next few years for larger, professional services companies that build centralized network management systems. These companies will allow network administrators to monitor highly heterogeneous and geographically dispersed networks from centralized locations.

Firewalls are used extensively to erect access barriers to and from corporate networks. Firewalls consist of computers and/or software that sit between the Internet and the protected business network. It controls and monitors the traffic through the passageway, effectively filtering unprivileged access attempts in both directions (Stamper, 1999). Firewalls can prevent attacks against internal systems; however, they can only provide trivial security assurance against attacks through the Web [24].

The most intriguing development in corporate networks lies in the use of intranets and extranets. Intranets are private networks built on the underlying network structure using Internet technology for the purpose of allowing common data representation mechanisms. Most com-

monly, intranets allow businesses to share company-wide information accessible with standard Web browsers.

Extranets have become popular as a middle-step between the Internet and VANs. Extranets combine Internet and intranet use in a logical network where the boundaries are described by its access privileges [6]. Extranets enable tight control over the privacy of connections and ensure identification of the people that visit a site. Extranets create a "pipe" that encrypts data sent across the Internet and provides complete control of what resources are visible at the service end of the connection [16].

Extranet popularity has brought about a number of powerful new securities management tools designed for extranet applications. In general, they allow managers to build a profile of security procedures from a pool of possibilities and then tie that profile to specific data resources, applications, user groups and network components over a wide range of scales. Since the members of a network can be both competitors and partners, they need to be able to draw secure perimeters around any group [19].

Extranets help forge intimate business links among partners, allowing them to share business data, and even collaborate on product design and development in private online communities. Businesses must learn to deal with their own networking environments, as well as those external to their boundaries. Without these links to the outside world, their ability to communicate and compete is weakened.

## 3. THE BUSINESS RELATIONSHIPS

Changes in the world economy are placing requirements of skills and resources that often exceed those of a single enterprise, requiring the formation of multiple alliances to ensure that the members of each alliance can attain the intellectual capabilities to deal with the complexities of their environment. Only through the careful application and sharing of knowledge can firms hope to outperform their counterparts and achieve sustained competitive advantage.

One of the catalysts for business relationships arises when companies decide to expand into the global marketplace. When the corporate network extends across borders, there are many additional factors that complicate the EC enterprise environment. International networks must consider political, legal, hardware-oriented, language and cultural issues.

Companies must assess if their products appeal to a global customer base, and if they can be marketed, sold, and shipped in a cost-effective manner. Parties local to the area of interest may have experience readily available to solve many of the issues at hand. By forming local relationships, companies can address the commercial and cultural differences. A common mistake made by companies entering global markets is to apply successful homeland trends and experiences to foreign marketplaces [3, 16].

Many do not consider the extra overhead needed to meet trade and export laws. Just because a company is able to reach a potential customer does not mean they can sell or deliver the goods and services at a price and level of convenience acceptable to both parties [22]. [20] offer excellent advice for companies expanding their market bound-

aries. They advise companies to "Think globally, build regionally, and operate locally," and thus, setting the stage for inter-organizational system relationships.

#### 4. THE INTER-ORGANIZATIONAL SYSTEMS (IOS)

To understand how companies can form and nurture successful relations in the competitive marketplace, one must study the underlying concepts behind the different organizational models. The organizational models provide frameworks for business-to-business relationships.

EC transactions depend on cooperation between two or more systems. [9] presents a classification framework for the different types of inter-organizational relationships. His classification is comprised of three major classes: Inter-Organizational Systems (IOS), Multi-Organizational Systems (MOS), and Extra-Organizational Systems (EOS). The first class, IOS relationships, involves two organizations in which a degree of trust and commitment exists. These relationships are usually in the form of a partnerships or alliances. The second class, MOS relationships, occurs between two or more organizations through different types of system connections. The third class, EOS relationships, cross organizational boundaries, but also include key participants who are not organizations, such as consumers and unincorporated enterprises. The type of relationship will help define the types of transaction environments required to support the company's operations.

The relationships listed above can include varying levels of control and interaction, and they can overlap. Companies may maintain any number of relationships involving one or more of the above classifications. Many of the relationships may directly or indirectly impact other relationships held by the company or those held by its participants. The rule in organizational relationships is that they be beneficial to all participants. At any point when one party does not benefit, the strength of the relationship is endangered. The most important objectives of commercial relationships are cooperation, coordination, and differentiation [8].

#### 5. THE INFORMATION PARTNERSHIPS

There are four types of information partnerships that can evolve through the execution of an enterprise strategy. [2] defines these partnerships as joint-marketing, intra-industry, buyer-seller, and IT vendor-driven. In joint-marketing partnerships, participant companies gain access to new customers and new territories. They expand their borders by sharing the cost of transacting, coordinating, and controlling market changes. Intra-industry partnerships evolve among competitors who see an opportunity or need to pool resources in order to keep up with the competition. This type of partnership is potentially difficult-to-manage because they are driven by the need to survive. Buyer-seller partnerships are those set up by sellers to serve their customers. Through a partnership agreement, the manufacturer or supplier is bound by a performance contract to provide a service, such as maintaining stock levels. An IT vendor-driven partnership allows a technology vendor to bring its technology to new markets by providing a platform for industry participants to offer new, technologically sophisticated customer services.

#### 6. THE ENTERPRISE TOOLS

The growth of enterprise tools is attributable to the drastic increase of competition on a global scale. Corporate decision-makers require accurate information about production, sales and marketing, finance, research and development, and personnel. They require timely information about their corporation and their business environments. How does one retrieve information that is dispersed throughout many corporate business structures, on a wide variety of platforms, and in many types of applications? Information retrieval in an enterprise environment is complex and time-consuming. Once the information is attained, it still must be analyzed [22].

The enterprise tools of today have become multi-dimensional. They focus on achieving an overview of a landscape with ever-changing borders that extend beyond the intellectual grasps of managers. Business intelligence concepts attempt to bring quicker data-to-information con-

versions and apply methods to format the results for accurate decision-making. These tools integrate many technologies to provide end-to-end business intelligence solutions to enterprises. These tools are classified in two groups: back-end and front-end [4].

##### 6.1. The Back-End Tools

Back-end tools are large, complex software and hardware configurations that encompass a large area of information processing, analyzing, formatting, and presentation. The tools mainly focus on streamlining in-house operations. The back-end tools being implemented include Enterprise Resource Planning (ERP) systems, Supply Chain Management (SCM) tools, data warehouses, and data mining technologies [10]. ERP systems are modular-based, real-time systems that integrate information from many organizational functions. They are designed to tie together dissimilar company functions to create more efficient operations. These tools have been successfully applied in the automation of processes along a supply chain [5, 12].

SCM tools facilitate negotiations between different functional areas competing for communal resources. Typical negotiations arise between manufacturing, research and development, and marketing. Postponements in any one of these areas directly affect the actions of the other participating functions. The challenge of SCM is to balance the requirements of reliable, prompt customer delivery with manufacturing and inventory management costs. To meet this challenge, managers must assess the supply chain in its entirety, not just the sum of its various parts [4].

##### 6.2. The Front-End Tools

While back-end tools have an internal focus, front-end tools focus on the external relationships. Front-end tools are customer-oriented. They are more flexible and less costly than their back-end counterparts. For the most part, they are customizable to a much higher degree, and their configurations are easier and faster to modify. These tools help businesses share knowledge; they are easy-to-use and provide a means of competitive advantage [5].

The most important area in the front-end category belongs to the Customer Relationship Management (CRM) tools. Enterprises consider this an opportunistic area to add value through customer-focused strategies and service differentiation. Effective customer relationship management depends on the value placed on customer information. CRM tools attempt to apply customer information as strategic capital. Even though most companies store large amounts of customer information; they are not able to generate, retrieve, research, and analyze this information in an efficient manner. The challenge of CRM is to help the company use their customer information to endow their customers with a feeling of importance, show the customers that the company understands their predicaments, and to ensure customer satisfaction.

CRM tools are designed to support the organization and customers through all stages in the customer relationship life cycle. These tools retain historical data on each relationship as they evolve through contact, and they allow organizations to share this data across functions. Since many teams may be involved with the same customer for different purposes, they still need to coordinate their actions [11].

As EC companies move more towards automation, they begin to lose spontaneity in business decisions. Workflow automation has two sides. It reduces time and cost, but it also takes away the "personal touch." At the business procurement level, there are new businesses appearing using electronic "business agents" to control business-to-business procurement transactions. The agents link various sites in an industry. These links create "e-markets," or Java Agent-Enabled Marketplaces [21]. JAMs form 24-hour, real-time automated markets and are programmed for bartering, quality estimations, and reputation management.

#### 7. SUMMARY AND CONCLUSION

The EC enterprise environment must fully support the business enterprise. This support is achieved through telecommunication networks, network-type relationships, and tools requiring networks. All

three of the above aspects require teamwork, sharing, cooperation, and integrated processes. The networks provide a means of distributed communication to support the tools and relationships. The relationships enable the pooling of resources that can be beneficial to many parties simultaneously. And, the tools provide decision support for large areas of responsibility with ambiguous borders and many areas of uncertainty.

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