THE CHALLENGES FACING GLOBAL E-COMMERCE:
A MULTIDIMENSIONAL PERSPECTIVE

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ABSTRACT

The power of Web enablement is that geographical boundaries disappear for an enterprise. Thus, an E-commerce initiative can easily become a global E-commerce initiative. Nevertheless, before conducting E-business globally, Web-enabled enterprises must consider an array of international economic, technological, social, and legal issues, which this article addresses.

INTRODUCTION

Each day sees numerous new individuals, organizations and government agencies all over the world linking up electronically to get or exchange information and to execute business transactions of one kind or another. Currently, several hundred million individuals and organizations worldwide have Internet access. This figure is expected to reach one billion by the year 2004. Once they are ‘connected’, both corporations and individuals find that the Internet has a profound impact on how they run their business. With its platform-independent technology and ubiquitous reach, the Internet is allowing companies to open up new distribution channels, forge communities of buyers and sellers, increase revenues, and boost the bottom line (Maddox and Blankenhorn, 1998). Available statistics on the tremendous volume of business currently conducted over the Internet seem to bear this out. By one account, online holiday spending totaled $4.0 billion in 1999 – more than 2.5 times the 1998 holiday Internet sales. Electronic commerce (EC) is, and will clearly continue to assume an important role in the modern consumer economy.

The growth of electronic commerce (EC) is taking place so rapidly and in so many directions that even experts are at a loss to find any established business models for comparison. People have compared the rise of EC to the radio industry in 1920s, television in the 1950s, video players in the 1970s, and personal computers in the 1980s. While these technologies had a significant impact, they pale in comparison to the impact that EC may eventually have on business (Kalakota and Whinston, 1997). According to a recent press report, Forrester Research reports that 90% of the firms surveyed plan to buy and sell on the Internet, and predicts that worldwide net commerce will total $6.9 trillion by 2004. Some predict that by 2006, business-to-business (B2B) commerce over the Internet will comprise 40% of all US business trade. Given the lack of historical data and the variation in the scope of definitions, widely disparate projections are reported in the literature. For example, the total B2B and B2C (business-to-consumer) commerce projections for year 2002 vary widely from $500 billion to $3 trillion (Turban, et al, 2000).

EC gives organizations and individuals the ability to transact business anytime and from anywhere and do it rapidly at a reasonable cost. For example, Cisco Systems, a successful
California based web commerce company makes Internet equipment like routers, hubs, and switches and sells them to networking companies like Sprint, and MCI-WorldCom. Cisco set up a web site called Cisco Connection Online (CCO) in 1994 and started selling its products on-line. In 1998, the company was able to save $363 million per year or approximately 17.5% of the total operating costs. In 1999, it sold roughly 60% of its total volume through CCO. This online operation currently handles 70% of technical support and customer service calls and has been able to reduce the technical support staff costs by roughly $125 million. Customers now download new software releases directly from CCO, saving the company $180 million in distribution, packaging, and duplicating costs. CCO also provides product and pricing information that saves Cisco an additional $50 million in printing and distribution catalogs and marketing materials to customers (Turban, et al, 2000).

EC also allows businesses to directly sell their products and services to consumers all over the world. B2C commerce allows businesses to sell without traditional intermediaries and thus reduce their operating costs, which are ultimately passed on to customers as lower prices. Several virtual storefronts are the new success stories in cyber world; for example, Amazon.com which sells books, CDs, and household items to customers over 150 countries, Wine.com which offers exotic wines to customers all over the world, and Buy.com which sells books, electronics, and all other kinds of items at discounted prices. In the finance world, companies such as E*Trade, Ameritrade, Charles Schwab, and DLJ allow their customers to buy and sell stocks without paying hefty fees to brokers. Traditional brokerage firms such as Merrill Lynch, Goldman Sachs, and Paine Webber that initially scoffed at on-line brokerages now offer web-based services to their customers. These examples show that companies based on Internet models have completely shaken the traditional businesses. Traditional businesses are forced to take a serious look at the phenomena and offer either partial services like Merrill Lynch over the Internet or start a new business unit to compete with the on-line rivals. Examples of the latter type are Barnes and Nobel, and Toys “R” Us. It is important to recognize that EC is not simply shifting business away from traditional “brick and mortar” operations to Internet-based operations. As a matter of fact, EC appears to be generating a significant amount of entirely new economic activity – one that would not have occurred in the absence of EC. This is largely because of EC’s unique advantages – an increased access to markets which brings more sellers and buyers together, along with better access to information that allows buyers to discriminate between alternative products and services. For the past few years, the Internet has been lauded as a great educational tool since it provides expanded access to an immense amount of information on a vast array of topics. It appears that the Internet is exerting a similar effect on the economy by providing a ‘marketplace’ where consumers have more options and more information to assist them in making purchasing decisions. The broad contention made by most observers is that this makes the electronic marketplace more efficient than traditional marketplaces.

EC is also redrawing the global commerce map. As nation state boundaries become more and more insignificant to the mobility of capital, and as time differences no longer pose any problem to the conduct of business, there are newer challenges that have emerged in the context of commerce in the electronic marketspace. In the following sections of the paper, we intend to examine some of the issues that stand in the way of successful implementation of global electronic commerce. We believe that organizations and individuals considering involvement in EC should carefully consider and understand the limitations and challenges that accompany the
opportunities existing in electronic commerce. Only then will they be able to successfully
develop and implement their business plans in the global market place.

**CHALLENGES FACING GLOBAL EC: FOUR DIMENSIONS**

The issues around global economic commerce can be examined at several different
levels. For example, we can pay attention to intra-firm considerations such as access to
technology, availability of appropriate skills, core competencies of the organization, and top-
management commitment. At the inter-firm level, we can examine the topography of the
competition, the level of institutional isomorphism in the industry, the nature of the supply
chains, and the kinds of networks that define the environment. However, in this paper, we are
limiting ourselves to a broader look at some of the external concerns around global EC.

We categorize these issues along four major dimensions namely economic, technological,
social, and legal (see Table). The boundaries between these are not hard and fast, nor are these
dimensions exhaustive. However, an examination such as the one below may contribute to a
better understanding of the underlying concerns around global ecommerce.

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<th>Economic</th>
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**The Economic Dimension**

Some economic considerations in EC are the cost justification of projects, the number of
sellers and buyers and their access to the Internet, the issues around infrastructure upgrade, and
the question of skill shortage

*Justifying the cost* of EC projects is a huge challenge. The cost of developing an EC
project is typically rather high. Further, mistakes due to lack of experience inflate these costs.
While outsourcing is an option, the issues that need to be resolved before making that decision
are not very simple. Also, when it comes to justification, traditional ways to assess the returns
are inadequate. It is very difficult to rely only on tangible benefits to justify a big EC project.
Many times, companies have had to embark on EC projects based solely on intangibles like
improved customer service, the value of advertisement and accrued competitive advantage.
However, intangible factors are extremely difficult to quantify. Over reliance on intangible
benefits may jeopardize the project or the future endeavors.

The commercial utility of the Internet rests in large part on the economy being
‘connected’ - the value of the connection to the Internet increases as others connect, and as the
number of buyers and sellers increases. We are still a long way from having the whole U.S. (let
alone the whole world) connected. Hence, in most applications there are not yet enough sellers
and buyers for profitable EC operations. Some sources indicate that less than 40% of Americans
have Internet access (Daley, 1999). The statistics are significantly worse among lower income categories, minorities and immigrants. The lack of widespread Internet access is an issue in Europe as well. EC operations, especially in small sectors in some European countries, may not be viable due to the high cost of localizing services combined with the low number of households that have access to the Internet. The picture is much worse in Asia, Latin America and Africa. At the moment, 90 percent of Internet host computers reside in high-income countries that are home to only 16 percent of the world’s population. This digital divide is widening between the developed world and most developing countries and there does not seem to be a clear solution to this problem in the near future. Furthermore, accessibility to the Internet is still expensive and/or inconvenient for many potential customers outside North America. In many countries, there isn’t the same proliferation in the ownership of a computer that is found in developed countries. Also, consumers have to pay hefty fees for Internet access and telephone connections that are billed on a per-minute basis. Only the wealthy can afford a computer and an Internet connection in these countries. Shanghai City, China, for example, has only 400,000 Internet accounts for its 12 million residents (Einhorn, 1999). Some progressive countries are devising innovative solutions such as community kiosks to work around these problems. As computer prices plummet and with the development of cheaper technologies such as Web TV, a critical mass is likely to develop around the world to support widespread global electronic commerce.

One major area of concern in global EC is the construction of a telecommunications infrastructure to support its explosive growth. The current infrastructure is inadequate to support the potential of EC. Most countries will need to completely revamp their telecommunication networks and equipment to take advantage of this new medium. However, the difficult question involves the sources of funding for this massive project that could run into billions of dollars. Capitalist countries like the United States are handing over this responsibility to private corporations. This route is often problematic for countries where governments have always led the way and controlled the growth. For example, the Chinese government exercises tight control over Internet activities – including business ownership, foreign capital influx, and Internet access (Einhorn, 1999). These controls govern the expansion of electronic trade in China. In most countries in Asia, Africa and Latin America, neither private individuals nor corporations have adequate capital to invest in these technologies and the government is slow to initiate any meaningful effort due to bureaucratic procedures or lack of funds. Since global EC depends on the electronically mediated connection of consumers and producers across the world, the absence of an adequate infrastructure is a major impediment to its growth.

There is a significant hue and cry in the press about the skill shortage and the dearth of information technology personnel trained in EC application development. Numerous hearings in the U.S. Congress have attempted to present evidence that corporations are losing millions of dollars simply because they cannot fill their vacant positions with qualified workers. The dynamism of the technology contributes a great deal to this shortage and emerging skill-arenas such as XML and ASP programming have far more openings than can be filled in the current labor market. The consequent improper staffing results in delayed projects and opportunity losses. The skill shortage is felt everywhere, raising costs in developed countries, and further precluding the possibility of EC projects in such nations.
The Technical Dimension

The technical considerations related to EC are related to security, reliability, communication protocols, bandwidth availability, and integration with existing applications.

As the Internet evolves into a global information infrastructure, the issue of security becomes a major concern. Consumers are distrustful about the safety of the information they give out on the web. Recent incidents indicate that relatively unsophisticated hackers can easily steal the information. Incidents such as the one at CDUniverse, where a hacker sold credit card information he/she stole from the site after failing to get a ransom from the company, cause a drain in consumer confidence. Unfortunately, in their haste to implement EC solutions, corporations do not pay enough attention to security. It was revealed after the CDUniverse theft that many companies store credit card data and other confidential corporate and customer information in plain text format without any encryption. Incidents such as these are the reason for reduced consumer confidence in online transactions.

Reliability is another significant concern in electronic commerce. Network infrastructure and application systems have to be continuously upgraded, fine-tuned and maintained to keep the systems running. Evidence indicates that current online systems may not be totally reliable especially when the transaction volume goes northbound. Major online brokers such as E*Trade, AmeriTrade, and Charles Schwab experienced systems failures during heavy trading. Other companies such as AOL and Ebay also face similar system setbacks. Added to this is the vulnerability of sites to denial of service attacks as demonstrated by the success of a 15-year old prankster in temporarily shutting down some popular sites such as Ebay, AOL, Yahoo, CNN, and MSN by overwhelming them with bombardments of info/service requests. Some estimates place the financial loss incurred as a result by these sites, their customers and the economy in general, at several million dollars. Such vulnerability further erodes general confidence in EC.

The question of communication protocols needs attention as EC moves forward along its current path. The current Ipv4 addressing scheme that relies on a 32-bit address system is likely to be a serious limitation as we move into the era of Internet-connected appliances from personal digital assistants to cars. Makers of Internet equipment have not yet adopted the proposed Ipv6 protocol with its 128-bit addressing. As Internet-based commerce enters the sustained development stage, these issues will have to be resolved.

Insufficient telecomm bandwidth is another stumbling block in the quest for the rapid expansion of web commerce. The current Internet 2.0 backbone operates at 45-155 megabits per second, enabling the WWW (Bell and Gemmelle, 1996); however, this bandwidth may not be sufficient for high demand applications such as video-on-demand. The possibility of the development of the multimedia Internet 3.0 backbone that can carry simultaneous data, video, and voice communications is still a wide-open issue. Aside from the financial risk and technological problems, public policy questions of access have to be debated and resolved (Zwass, 1998). Currently, many consumers are connected to the Internet at low speed links that take a long time to download web pages. Even though technologies such as cable modems and those based on ISDN and ADSL are being introduced into some markets, they are very expensive and not widely available.
There are difficulties in integrating Internet and EC software with some existing applications and databases. Many of the integration solutions are provided by software systems called middleware that connect disparate systems. The middleware are designed to work with popular software systems, but many organizations have homegrown applications or other commercial software for which they develop their own interfaces. Integration software is also difficult to maintain and organizations often expend an inordinate amount of ongoing resources to maintain them.

The Social Dimension

There are a number of social/cultural issues that need to be addressed when considering global EC. Some of them are the concerns with privacy and security on the Internet, the challenges of cultural diversity, the questions raised by user resistance and inadequate trust, and the absence of a tactile medium for online sales.

Security and privacy issues are major stumbling blocks for the growth of EC. Consumers hesitate to disclose confidential data such as home address, social security number, and their credit card number over the Internet. A significant percentage of the general public does not believe that conducting business on the Internet is safe (GVU 10th User Survey, 1999). Privacy & American Business, an industry newsletter, contends that 61% of U.S. Internet users have at one time or another declined to buy something online because of privacy concerns. Forrester Research indicates that online privacy is almost always reported as the number one concern of consumers. According to their research, this lack of confidence has resulted in lost sales of $2.8 billion in 1999 alone. Consumers continue to question whether EC offers sufficient safeguards that protect their privacy from being breached or their money from being stolen. In a bid to provide customized service to ‘visitors,’ most web sites use cookies to collect information about an individual’s comings and goings – usually without the person’s knowledge and/or consent. Most companies neither provide any explanation about how the information collected will be used nor offer any assurances about the security of the information. It is also clear that many businesses do not know how to protect themselves against crackers and hackers; many do not disclose information about online attacks against them for fear of losing consumer confidence. This silence contributes to the increased vulnerability of corporations to hacker strikes (Gaudin, 1998). Many law enforcement authorities do not have enough resources or a sufficient number of experts working on cyber crimes. In any case, it is neither prudent nor feasible for any one government to attempt policing the Internet - which is global in nature.

The cultural diversity of consumers needs to be taken into account while designing EC sites. The ability to customize the interface for individual/group needs is one of the greatest assets of EC. However, developing an EC site in a fashion that allows it to meet local needs and preferences of many different customer groups is a major challenge for developers. Further, customization tends to be rather expensive. The lack of sophisticated translation tools does not allow an easy translation of web pages from English, the dominant language of the web, into local languages. These tools are slowly being developed and other languages are coming ‘online’. The current costs of translation run from $10,000 to $500,000 depending upon the complexity of the web site. It is also is clear that EC sites need to be tailored to take local
variances into account. Sometimes, an in-depth study of cultural tastes is warranted before offering products or services to consumers. For example, Andersen Consulting conducts research into the differing tastes of travelers from various parts of the world and manages its web sites in a way that reflects local preferences and tastes (Gupta, 2000).

In a traditional business environment, trust is generated transitively (for example, a friend’s recommendation), from previous personal experiences, or through transparent legislative infrastructures (depositing money in a bank that is subjected to strict banking regulations). In the EC environment, an entirely new method of trading, none of these factors may exist. This lack of trust often results in user resistance towards buying products or services through EC. Some studies show that only a small fraction of web surfers actually buy at ecommerce sites. Ecommerce companies have realized the importance of brand identity that creates a sense of trust in the company. Online companies are spending enormous amounts of resources for building brand identity. Brand identity is considered even more important (and is correspondingly more expensive) for corporations that wish to conduct business globally.

As several studies have indicated, the absence of “touch and feel” in online commerce is a significant problem. However, most businesses are working around this limitation. Typically, consumers do not buy big-ticket items such as cars without physically seeing them and test driving them. The web is able to offer a host of services (research, comparisons, pricing etc.) that lead to the final purchase and organizations are arranging for test drives at dealerships. Here, both the traditional and web based models are merging to provide a suitable business model for this industry.

The Legal Dimension

Many legal issues are yet to be resolved in this new cyber medium. Introduction of new technologies especially those with profound ramifications like the Internet and World Wide Web is a highly disturbing force that shocks the existing norms in a society. The legal system gets perplexed with the new challenges that question the validity of existing laws. New laws have to be enacted to take care of the new problems or issues that technology introduces into the society. In this section, we discuss issues related to intellectual property rights, legal validity of electronic transactions, taxation issues and the question of violation of local laws.

Digital media is vastly different from traditional media such as books, periodicals and journals. It is far more amenable to replication, transmission, and alteration. It is compact and can be stored easily. It is difficult to classify, categorize and catalogue. These characteristics significantly alter the terrain concerning intellectual property rights (Laudon and Laudon, 1999). The issue becomes even more complicated in the international arena. Typically, different countries have different attitudes towards intellectual property rights and despite attempts by global bodies such as the World Trade Organization, the debate around these rights is far from resolved. Furthermore, the manner in which information is obtained and presented on the Web challenges intellectual property protections. A web page can be constructed in such a way that each one of the components can come from different sources, making the issue of ownership and compensation very complicated (Okerson, 1996). This issue promises to be a major factor in the development of global EC. On a related note, many argue that the Internet was designed to be
open and transmit information (even copyrighted information) freely around the globe. They contend that the continued development of the Internet is contingent upon its loose and chaotic organization, which allows the transmission of free-flowing ideas and processes. Others claim that new laws need to be designed in order to protect original and copyrighted contributions. The latter gives rise to a new question: what exactly is patentable or copyrightable in the EC environment? It is not quite clear what constitutes a new and useful process or improvement. Patents have been issued for broad ideas that one would be hard pressed to describe as original. Examples include Amazon.com’s billing and shipping processes and Priceline.com’s airline finder process. By 1998, 2200 patents had been issued in connection with the Internet. The opponents of this patent-frenzy suggest that the application of offline patent laws to online systems will only serve to stifle the Internet’s development.

One of the most important concerns thrown up in the EC debate has been the issue of the legal validity of electronic transactions. Most businesses developed over a period of time during which the means of conducting commerce was in person and based on paper documentation and “wet” signatures. Existing laws in almost every country require that contracts be evidenced by written documents (in physical media). For EC to flourish, this recognition needs to be extended so that electronic documents and signatures evidencing contracts can have the same legal validity as written signatures and documents. It is widely believed in the EC community that digital signatures and other forms of electronic authentication can provide greater security and certainty regarding the identity of individuals and the content of important documents than traditional written and printed documents. Without this recognition (through appropriately enacted laws) the future of EC expansion will certainly be hampered. Appropriate legislation is also required to address other aspects of electronic transactions. Currently, it may be difficult to say with certainty where a commercial EC transaction actually takes place and which jurisdiction may have regulatory authority over the transaction. A stopgap measure used by most websites is the so-called ‘Forum Selection’ clause that a consumer is required to agree to. This binds the consumer to travel to the seller’s local jurisdiction for the settlement of any disputes that may arise from the electronic transaction. Global standards concerning this are still being debated.

**Taxation** in the EC environment is another important issue that needs to be resolved. It is also one of the major issues among the Presidential candidates in the 2000 elections. So far, U.S. legislators have been successful in preventing the imposition of new sales taxes on Internet related businesses until late 2001. On the one hand, State and local governments want sales tax to be imposed to protect their own tax revenues and the local businesses and local economy. On the other hand, both legislators and think tanks argue that imposing sales tax at this early stage of development would impede the growth of the Internet economy. Furthermore, the modalities of implementing and collecting Internet sales taxes are rather complicated, to say the least. These complications increase substantially in the international arena. Different nations have different tax structures and the question of jurisdiction is not easily resolvable when the seller and buyer are in different states or countries.

A related issue of concern for many corporations is the sale of commodities that are **restricted or illegal by the laws** of the country in which the product or service is being sold. A company such as Wine.com has to be careful not to break any of the local, state and national laws while selling wines around the globe. This is also an area of concern in the U.S. especially
with regard to the sale of pornographic material, illegal weapons, restricted chemical items, online gambling services, etc. Instances of this occurring at popular well-respected sites without the knowledge of the site’s owners (such as Amazon’s auctions and zShops, and Ebay’s auctions) have been reported (Wolverton & Sandoval, 1999).

CONCLUSIONS

We are witnessing a paradigm shift in the way business is conducted in the current economy. EC is one of the more significant changes that are sweeping across the business landscape, redefining it in entirely novel fashions. Global EC is significantly altering the contours of space and time, reshaping the meaning of value, shifting the power to consumers, and reinventing the nature of management. In this dynamic environment, traditional institutions need to redefine their roles and reposition themselves. Though EC is in its formative stages of development, its extraordinary growth over the past years is a clear indication of its enormous potential for influencing the way business will be conducted in the future. These new opportunities, however, come accompanied by a large number of concerns and questions that need to be resolved. In this paper, we have discussed some of the challenges that face organizations embarking upon this new path. The issues we outlined are merely representative; they are neither collectively exhaustive not mutually exclusive. However, they need to be addressed with seriousness if global EC is to negotiate the uncharted waters ahead.

REFERENCES


