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## **E: COMMERCE: WHERE DO WE GO FROM HERE?**

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### **ABSTRACT**

The dynamics of the Internet and e-commerce has spawned change in business and industry since the early 1990s. Many e-merchants have benefited from it, while others fell behind. B2B, B2C, and B2G have all matured and grew to be the backbone of today's World Wide Web. As a result, a number of issues, problems, and reflections have come up that warrant analysis. In this paper, we bring up key trends and developments in e-business, where e-commerce is going, and the implications for management, profitability, and potential growth. Mobile commerce and wireless technology is especially noted.

### **INTRODUCTION**

The Internet has already generated an unstoppable economic tidal wave. At the end of the year 2000, over 200 million users have become Web surfers (Deloitte Research 2000, p. 1). Spending on government Internet activities will increase from \$1.5 billion in 2000 to \$6.2 billion by 2005 (Thibodeau 2000, p. 12). Inasmuch as e-commerce has already impacted our workstyle and lifestyle, it is still in its infancy. Predicting its future is not an easy task. For example, technology consulting firm Forrester Research more than doubled its B2B commerce forecast for the United States to \$842 billion by the year 2002. For the Non-US sector, B2B commerce is predicted to generate revenue well over \$1 trillion in 2002.

The future of e-business depends on myriads of factors—technological, political, and economic. Technological advancements, for example, will provide the framework for improvements in the efficiency, adaptability, and convenience of the Internet and e-commerce. The applications harnessed by enhancements in today's technology should further improve the entire e-commerce process.

Three of the most recent technological advancements are broadband Internet access, the use of XML, and enhancement of Web browsers. Implementing efficient and effective transaction and payment systems is a crucial part of future e-commerce. E money will also play a significant role in legitimizing the e-transaction process. E money is expected to eliminate unnecessary processes and enable faster and easier transactions to take place on the Internet.

In this paper, we focus on trends and developments in B2C and B2B that might help us assess where e-commerce is going and the implications for management, profitability, and growth. We shall also address e-new applications, the future of money, and wireless transmission as an enhanced approach to navigating on the Internet.

### **THE INTERNET CUTS THE CORD**

North Americans hold a record of the biggest Internet users worldwide. As shown in Table 1, there were well over 150 million users in 1999. According to International Telecommunication Union, the number is predicted to exceed 231 million users. The fastest growing technology after the Internet is wireless communications—also known as M (mobile)-commerce. It is the union of the Web and the cellular phone, offering universal access from mobile phones to the Internet via Wireless Application Protocol (WAP).

WAP is a hot topic, because of its linking role. The emerging standard delivers wireless information and voice services to mobile phones, opening doors for wireless computing at companies—large and small. The WAP Internet server connects to most e-mail or database, providing data directly to the user. Its potential e-business contributions include banking, stock trading, e-mail, voice, remote monitoring, transferring money between accounts, or paying for purchases electronically. Interoperability through WAP makes these unique applications possible

<b>Internet users by region(in 1,000s) 2005</b>	<b>1995</b>	<b>1998</b>	<b>2000</b>
Worldwide total Internet Users 765,776	44,324	181,789	349,254
Worldwide Internet Users/1000 people 118	7.8	30.7	57.5
North American Total Users 231,451	30,771	93,650	150,850
North American Users/1000 720.6	104.9	311.2	492.6
W. Europe/Scandinavian Total Users 213,670	8,713	42,006	87,443
W. Europe/Scandinavian Users/1,000 529.9	22.1	105.8	220.5
East European Total Users 45,472	375	3,800	10,806
East European Users/1,000 157.7	1.3	13.0	37.2
Asia-Pacific Total Users 189,651	3,547	33,656	72,066
Asia-Pacific Users/1,000 50.9	1.1	9.9	20.7
South/Central American Total Users 56,051	410	5,647	19,629
South/Central American Users/1,000 101.2	0.9	11.4	38.4
Middle East/African Total Users 29,481	508	3,030	8,160
Middle East/African Users/1,000 26.1	0.6	3.0	7.9

Table 1. Internet Users worldwide. Source: International Communication Union, The Wall Street Journal, Sept. 25, 2000, p. R6.

The mobile technology, per se, should change forever the way companies do business. It means that businesses can extend directly business processes to those in the field that deal directly with the consumer. For over a decade, technology groups have predicted the technology to bring e-mail, news, and stock trading via a mobile phone equipped with a wireless modem. Initially, the cell phone carried voice, was expensive, unreliable, and the networks too slow to attract customers or traffic. Now, digital networks are fast replacing analog cellular networks to send or receive data from almost anywhere. It is also converging with the Internet as part of the worldwide data network (Hill 1999, p. R4). Based on Geoworks/Bank of America study, there were

600,000 wireless subscribers in 2000 and project 760,000 wireless subscribers in 2001, 950,000 in 2002, and 1,200,000 in 2003 (Korn 2000, p. 58).

To make the linkup possible, digital phones come bundled with microbrowsers that connect them to Web sites. The sites are formatted to send text pages acceptable to tiny screens. The procedure is very simple. A consumer makes a phone call or places a request on a wireless phone. The signal travels from the wireless device to an antenna and into the cellular telephone company's switching facility. From there, it is switched to the wireline network and to an Internet service provider that connects to the Web.

Experts predict that the combination of cell phones and the Internet will be explosive worldwide. By 2005, an estimated half-billion Internet accounts and one billion digital-phone subscribers will be in operation. This is primarily due to the increasing demand for data everywhere. Another research group, Yankee Group, predicts 28 million Americans will be using wireless phones for data by 2002, for e-mail messaging, Internet browsing, and other e-applications (Hill 1999, p. R4)

With all the promises and high expectations of M-commerce, there are issues that have yet to be resolved. Among such issues are security, competing e-commerce standards, problems integrating cellular phone architecture with that of the retailing and banking hardware, and the below par man-machine interface on today's mobile phone (see [www.mobilemcommerce.com/what\\_is\\_mc.htm](http://www.mobilemcommerce.com/what_is_mc.htm) p.1). Furthermore, WAP is relatively new. There is still the question about how far it will be deployed and how fast it will

be (Saunders, et al 1999, p. 48.) In the next few years, we should experience big changes in M-commerce. How quickly they arrive depends on how much the carriers invest in faster technologies. Table 2 summarizes the key elements required to upgrade carrier network and their respective improvements in download times.

In terms of privacy, imagine the location-finding technology being built into the new cell phones. What if, for example, you find that when you dial a pizza parlor, triggers a message to a health or a diet store that you are both overweight and affluent and a message offering you all kinds of discounted health pills? The issue here is "who gets access to this information? This is unfortunately, the dark side of e-commerce. It is the same computer technology that delivers individualized advice on books, music, and supplies, it creates an inescapable trail of personal information (Clark 2000, p. R32).

Year	Elements	Time to download 164-kbyte file
1999	GSM	2.17 sec.
	HSCSD	.45
2000	GPRS	.33
2001	Edge	.10
<b>Legend</b>		
GSM – Global System for Mobile communications -- a wideband method of sharing one frequency among many users that currently has some 150 million users worldwide		
HSCSD – High-Speed Circuit-Switched Data – software that gives each subscriber up to four 14.4-kbit/second circuits.		
GPRS – General Packet Radio Service – hardware upgrade that employs packet switching to use bandwidth more efficiently.		
Edge – Enhanced Data Rates for Global Evolution		

Table 2. Required elements to upgrade carrier network. Excerpted from Saunders, et al "Wireless IP". Data Communications, Sept. 1999, pp. 49, 52.

In terms of security, to provide full protection in a wireless environment involves encryption algorithms to scramble data, antivirus software, and digital certificates to restrict access. With encryption, the larger the algorithm, the stronger the security and the longer it takes to decrypt (Saunders and Bruno 1999, p. 62). Each type has to be considered individually in the light of the traffic and the nature of information transmitted. In most cases, all types should be part of the e-commerce environment to ensure privacy and integrity of the e-merchant-consumer interface.

### Role of the Emerging Wireless Broad band

Wireless broadband handles phone calls and the Internet with good quality transmission at high speed. Unlike land-line broadband which relies on local phone lines, wireless broadband uses high frequency signals to transmit information over the airwaves to and from customers. But it should be noted that wires still play a role in most systems. For example, in fixed wireless systems, the digital signal from a phone is carried through office wiring to an antenna atop the building and to a base station miles away. The base station captures the signal and transmits it to a local phone network or a cellular provider of

another network, depending on the final destination of the message.

Given the developments in the emerging wireless broadband, some estimates place the number of wireless broadband users to more than three million by 2004—a big jump from 200,000 users in early 2000 (Hill 1999, p. R14). Regardless of the actual numbers, wireless broadband brings flexibility in its application that will make it possible for the video business to transmit it over the airwaves.

### **The Wireless LAN**

An emerging approach to local area networks that has begun to spread via the Internet is the wireless LAN. This type of technology is already being installed on jetliners to link them into enterprise information management systems and hotels to support mobile check-ins and check-outs (Brewin 2000, p. 60). Based on evidence to date, wireless LANs have higher initial installation cost than the conventional LANs, but in the long run they are expected to be cost-effective and outperform the conventional set up.

Like other technologies, since wireless LANs operate essentially “on the air” in the same 2.48-GHz frequency band as cellular phones, security problems exist. It means that wireless LAN users may install Wireless Equivalent Privacy (WEP) 40-bit encryption protocol to assure security in transmission and reception of data. Without it, the system is vulnerable to other overhearing the traffic. In giving up privacy in exchange for convenience, going wireless could eventually make users yearn for the anonymity of the past.

In summary, the need to be tethered is fast disappearing. Eventually, everything electric will interface with everything else electric using wireless communications. Futurists predict that eventually, all long-distance traffic will be fiber and all short-distance traffic will be radio frequency or RF. With the astronomical surge of wireless transmission, it is also predicted that the Internet will become wireless and ubiquitous and, eventually, it will disappear (Negroponte 2000, Vision 21).

### **THE FUTURE OF E-MAR-KETING**

As we head into the 21<sup>st</sup> century, our lives will be influenced by the Internet and e-commerce. The Internet has and will continue to change the way business interacts with customers. As a result, the economy should become more efficient as customers are provided with more ways to purchase the goods

and services they desire. The Internet gives the consumer the opportunity to conduct in-depth research on a specific product and then search for the best available price offered on the Web. In fact, one of the latest developments in Web shopping is the shop bot that searches out the lowest price for a generic product (Varian 1999, p.2). The question for companies becomes one of deciding how to build their brand and acquire customers. The very profitability of e-commerce depends on brand awareness and customer loyalty.

In terms of customer loyalty, any company that treats customers in a personalized way will earn respect and therefore loyalty. According to Binary compass Enterprises (BCE), on-time delivery is the key for gaining customer loyalty. Ninety-six percent of shoppers who received their order on time said they were “likely” or “very likely” to shop at the e-merchant again (Koprowski 1998, p.13). Frequent-purchase or incentive programs are also alternative attractions for promoting loyalty.

A recent technology-based approach to luring nearby customers is satellite-based location technology, referred to as **L-commerce**. This technology is capable of tracking people on foot or in moving vehicles. It could be used to allow stores to identify nearby customers and lure them inside with advertisements and discount offers. Based on satellite-based Global Positioning System (GPS), users receive signals from a nearby satellite that sends location and other information to allow the prospective customer to triangulate his or her position. The key question here is “will customers want businesses to track them?” This is where the invasion of privacy issue comes up (Nichols 2000, p. 18).

### **Role Of Robotics**

Reduction in transaction costs by smart software agents (bots) that seek out the best price and product specifications is an excellent sign that the retail consumer business sector will benefit. It also means that survival in future retailing means transformation. The initiative could develop into armies of software agents on the Internet looking for best prices, matching customer profiles for color, size, and fit.

A bot is not that difficult to use. A user simply types in a search engine a product name or a service and gets a list of Web merchants and their respective online prices. Yet, according to White (White 2000, p.R18), shoppers have found them strange to understand. They are tough to explain, with no

offline equivalent. For a bot to do its homework, it has to be able to access the databases of different e-merchants, which is not always permissible. For example, eBay went to court in September 2000, preventing bot access to its databases.

As e-commerce explodes into the future, there is the potential for strategic “wars” with the wide introduction of bots. A site like [www.botspot.com](http://www.botspot.com) gives an inkling of the kinds of agents presently being tested. IBM Institute for Advanced Commerce conducted a simulation game, in which they instructed software agents to purchase information for human customers. The system kept track of economic and competitive data. The results were periods of economic lull, occasional prosperity for the e-merchant, pitted by sporadic price wars. All this leads one to think seriously about who will own the customer in the next century (Deloitte Research 2000, p. 9)

Internet bots that search and “shop” for consumers appear to behave like humans, but in fact, they are clumsy at functions that humans do well—understanding, judgment, and initiative. To date, they are viewed as complimentary tools, not rivals to human discretion. Bots are agents or smart things that make decisions and act. They seem intelligent, but they are handicapped by inability to “learn”, sense, or “think”. Humans develop these capabilities through social existence. Artificial intelligence lacks social existence and will remain primarily a metaphor for society. Common sense is simply beyond robots or bots for years to come.

Based on the trends and directions of information use, the gap is fast narrowing between smart bots and humans, with bots taking on human chores like brokering and negotiating prices and business strategies. They compare past activities with product suggestions. In most cases, they represent buyers, although they have been known to act as double agents, representing sellers also. In so doing, it is not easy to determine whose interests smart bots represent (Fraime 2000, p. 210.)

Related to bots and e-marketing are **e-commerce outsourcers**. A new breed of e-commerce service providers, e-commerce outsourcers handle everything from warehousing and settling with suppliers to shipping orders and payments. The e-merchant has only one contract with outsourcer, while the outsourcer handles multiple contracts with suppliers (King 2000, p. 56). There is one-time setup fee (typically starts at \$100,000) and monthly

maintenance fee (\$500 or more). The customer keeps up to 80 percent of the profit margin.

From all indications, technological and social systems do not develop separately, but interdependently in complex feedback exchange. Each system drives and accelerates change in the other. In e-commerce, the consumer sounded the alarm of impatience with the time-consuming process of brick and mortar shopping and its ills. As a result, technology paved the way with sophisticated business-to-consumer infrastructure taking orders, processing payments, and delivering on time to the satisfaction of the cyber consumer. But in doing so, the human interface is minimized in exchange for speed, convenience, and efficiency of shopping. Bots were introduced to do the legwork necessary to fish for the best price available on the Internet.

These developments bring up the role of the “middlemen”. Middlemen, it turned out, are not as easy as the Internet pioneers have envisioned. The concept of “bot” is essentially that of a middleman. Take a look at real-estate agents listing properties online. They often withhold vital information so that buyers call the broker before consummating a deal with the seller. Likewise, in home building, even though 90 percent have Web access, less than 10 percent use the Net to buy their materials. The main reason is obvious—this type of business is not ready for prime time. In any case, it seems that e-commerce and e-business is not so different from buyers and sellers. Consumers still look for deals, whether it is buying a new suit or a different camera. Likewise, computer makers look for a new and cheaper source of chips and other devices. When the “e-way is easier, faster and cheaper, it can win” (White 2000, p. R4).

### **Machine-to-Machine and Seam-less Marketing**

So far, the Internet has been the most human-friendly technology, allowing millions of average users to shop online and conduct business. Today, we are beginning to see a surge of machine intelligence to ease the interface. Interconnections between machines and the Internet are predicted to outnumber the connections made by humans (Benko 2000, p. 122). Trucks will stay online with headquarters for delays and e-merchant Web sites will alert suppliers order-taking machines to be on the alert for sudden change in demand for their products. A customer-friendly period is coming online and those customers will be machines.

Another marketing trend melds online Web sites with their brick and mortar presence. As a symbol of convergence, consumers can now use the convenience of online shopping and going to the nearest store of the merchant to inquire about the item ordered, return merchandise, and otherwise settle transactions the old-fashioned way. Obviously, all that will vary, depending on the store. Seamless shopping can be pleasant or a nightmare, depending on the efficiency of the Web site, the personal treatment of the brick and mortar customer service, and the attitude of the customer toward the experience.

### **BROADBAND TECHNOLOGY**

This emerging technology of 100 kilobits or more per second will enhance the entire online experience by making communicating, retrieving, and sending information much faster and easier. It is a solution to the bottleneck that exists in the telecommunication network over the "last mile" or local loop. While the core of the network operates at high speed, the traffic in the last mile is forced to slow down before reaching the customer. The primary cause is the Public Switched Networks (PSN) architecture, which is based on analog frequency and runs at 4kHz per channel. When converted to digital signals, these circuits are equivalent to only 64Kbps. By increasing the bandwidth of the infrastructure of the last mile, broadband allows more data to reach customers at a faster pace (Bank of New York 1999, p.7).

#### **DSL, Cable Modem, and New e-Applications**

The two main types of broadband solutions for future e-transmission are xDSL (Digital Subscriber Line) and cable modems. xDSL is a form of broadband data/voice transmission that makes use of existing copper wires. Its present use is not cost effective, with prices ranging from \$30 to \$150 per month. Speed ranges from 128Kbps up to 1MB (Goldman Sachs 1999, p. 8). In contrast, broadband cable works over cable wires that enters roughly 68 homes nationwide and many more internationally. Cable wiring has higher bandwidth than simple copper wires, which allows faster data transfer. At an average of \$40 per month, broadband cable is the most affordable form of broadband available today. A cable modem can operate roughly 25 times faster than the analog modems of today. It allows for many applications that will affect e-commerce in significant ways.

As the number of broadband users grows, so do e-applications. Unlike the analog modem that allows

for still image with some ability to view streaming video, broadband technology allows such applications to run at a much faster rate. For example, a five-minute video clip would take roughly 20 minutes to download using an analog modem, while the same video can be downloaded using broadband in a matter of seconds.

So, as broadband progresses and the number of users continue to grow, the applications that are enabled will become more and more significant. Each application may provide significant utility to online consumers. E-commerce sites will become more personal and entertaining, while online purchasing and payment systems will become easier to use and more effective. The ideas and visions of e-commerce executives will be unlimited in the future. The use of video-conferencing will allow Web sites to have a customer service person on demand to videoconference with. This will enhance the effectiveness of all e-commerce sites, no matter what industry they are involved with. Full motion video will allow Web sites to have instructional videos on the use of their Web site. Full motion video, combined with video on demand may eliminate blockbuster and other video rental stores. A customer will be able to click on the movie of his or her choice and watch the movie from the comfort of his or her own home. These applications will also provide a new means of advertising, perhaps allowing advertising to be a form of entertainment.

### **THE FUTURE OF MONEY**

Money as a medium of exchange has constantly been evolving, especially in the e-commerce world. Technological improvements as well as economic forces have altered both the physical form of money and the way it is transferred. In order for the Internet and e-commerce to meet the challenge, creative and reliable forms of electronic money must be in place to represent real money.

Based on today's technological developments, the two main technologies likely to emerge in the future are smart cards and VeriSign. For smart cards, Data Quest forecasts that by the year 2001, 3.4 billion smart cards will be in use worldwide (The Future Of Money, p. 1). The attractiveness of smart cards lies in their ability to store and manipulate larger quantities of data. As chips get smarter and faster, this will eventually lead to all encompassing smart cards that contain not only monetary data, but personal data such as medical information as well. They will essentially become an entire current day wallet in a single card.

The only thing that is holding smart cards back from exploding into the e-commerce world is the lack of readers. There are two ways in which a PC can read a smart card. The first requires a slot on the PC to read the card and allow some type of contact. The second is the contactless card. This card emits an infrared beam that transmits data to the PC. This method is likely to evolve as the preferred technology.

The smart card that is expected to become the standard in the next millennium is a rechargeable one. In essence, it will act as a wallet that allows the user to make and receive transactions instantly. A user will sit down at their PC or another terminal and be able to conduct multiple financial transactions. To receive money, the user can go to their bank's Web site, access their account or withdraw money onto their smart card as is currently done at ATMs. It will probably be possible to do the same worldwide through personal data assistants with satellite communication links. Payments can also be made directly to a vendor online by simply connecting the card to the PC. The card and the PC authenticate each other and can be verified by the user by entering a PIN. Some emerging smart cards such as mondex also allow for the payment from card to card or user to user ([www.goldmoney.com/future\\_money.html](http://www.goldmoney.com/future_money.html)).

### **FUTURE BROWSERS**

With the surge of Internet users and sites, browsing software has grown in size and complexity. However, browsing software has yet to implement consistent standards, which is preventing rich Web application development. Browser firms such as Netscape and Microsoft continue to improve browser software in order to deliver the best Internet experience. Some of the improved features in the near future call for small size with high performance, improved speed, same-time communication, standards compliance, and open source code (www.Winmag.com 1999, p. 1). For example, recent smart browsing improved the speed of search engine. Some of the improvements in these services are key word additions, new keyword features, stock quotes, and more.

In terms of open source development, it is the software development model of the future. Closed development leads to longer development times, lower quality, high-budget projects, non-standard implementations, limited platform coverage, and risk of losing connection with consumers and market demands. So, open source, such as Linux and Apache, prevent these problems in the application. Some of the benefits of open source development are its ability to develop higher quality and more stable

application, faster development, 'broader availability, platforms, and languages', proliferation to other devices, and better standard support.

### **NEW OPPORTUNITIES WITH XML**

XML (Extensible Markup Language) is a meta-markup language introduced in 1998. Its key feature is providing a format for describing structured data. It enables a new generation of Web-based data viewing and manipulation applications. Since many customer services are migrating into the Internet from call centers and physical locations, they can benefit from the advance features of XML. As this new language advance into more organizations, opportunities will expand as more vertical market data formats are created for key markets. These markets include advanced database searching, online banking, medical, legal, e-commerce, and other fields. These opportunities are expended even farther with the ability to dispense data rather than just view it.

The attractiveness of XML is obvious by the surge of organizations that have already adopted it due to its intelligence (how well data knows itself), adaptation (how well data changes in response to changing times) maintenance (how easily data is cared for), and simplicity. These features result in more meaningful search results across multiple platforms, and more detailed declarations of content. The most improved features of XML are extensibility, structural representation of data, and separation of data from the presentation and the process (MS.DataChannel XMLFramework for Microsoft Office 2000, p.14).

### **SOCIAL, POLITICAL, AND ECONOMIC IMPLICATIONS OF E-COMMERCE**

In designing e-commerce applications, there is a trend toward looking beyond the potential of the technology to social factors such as the limited tolerance of the average user. For example, the elegant simplicity of the PalmPilot has made them readily usable. It created an important social support system (Brown and Duguid 2000, p. 197). The device is so widely used that rarely is there a user who has trouble with its use. This means that technological and social systems are beginning to support each other.

The emergence of Internet infrastructure in the developing world has far reaching political, economic, and technological implications for e-commerce. In the third world, telephone companies were typically state-owned monopolies. These monopolies began to



interlink under the standards of the International Telecommunication Union. It was the beginning of establishing a linkup internationally, paving the way for e-commerce. As a result, community and country boundaries are being redefined. For the developing world, assumptions about the value of information in countries like China and Thailand are beginning to take special meaning politically and economically. The potential of the Internet and e-commerce lies in developing countries worldwide. Ultimately, it is the global arena that will determine the potential of the Internet in tomorrow's e-business (Mueller 1999, p. 30).

In the U.S, the headline "Technology Will Test A Washington Culture Born In Industrial Age" appears on the immediate horizon. The digital economy, where speed and indifference to national borders are known attributes, is generating unique issues in Washington at Internet speed. For example, the political question "should Internet companies be taxed like telephone companies to fund Internet connections in public schools, even if it hinders e-commerce firms? Or, should the Internet be used to allow insurance companies to access your health records before deciding on your application? Should consumer privacy laws prohibit that? The Internet makes insurance, employment, and financial records vulnerable to prying eyes. Politicians found the loss of privacy in the Digital Age too hot to avoid. These issues are ones that the Congress will have to address that many congressmen don't understand (Davis 2000, p.A1).

With all said and done, the growth of e-commerce will depend on how well the Web matures into a respectable and a reliable vehicle for exchange of products and services worldwide. With shop bots and satellite communication intelligence, computerized devices woven into products and connected to the Internet to expedite their sales and destination will be part of a system that will monitor every which move. The intent is to match your shopping needs to the available products. But then, sooner or later, the question " am I in control of making my own decisions or is e-business in control of me?"

### **Role of Privacy and Security**

As mentioned throughout the text, increasing demand for information on consumer buying habits threatens privacy and confidentiality of personal data. The emerging role of **Chief Privacy Officer** (CPO) is making headlines. Because new regulatory issues translate into technology, initiations such as

**Customer Relationship Management** (CRM) and help desks, CPOs most often are recruited from the IT area or out of the legal department.

The biggest challenge of a CPO is setting up the privacy code and educating the company's work force on privacy. CPOs must also create a demand to address customer channels to address their data within security guidelines.

Related to privacy is the issue of security, which will continue to increase in tenacity and complexity. Security vendors are working in earnest to bring enterprise-level capabilities to firewalls distributed throughout the firm or update dozens of intrusion detection systems at the same time. A recent e-security trend integrates alarms and alerts from various security products. Based on artificial intelligence rules, one open e-system monitors components such as firewalls, databases, and e-mail services round the clock (Desmond 2000, pp. s5-s24).

Potentially, the real e-security challenge will employ PKI components with current applications and manage digital certificates. PKI systems use digital certificates to act as a digital ID card for each user. The card can be used to authenticate payments, sales, Web access, and the like. In all, regardless of the technology and advanced security and privacy techniques, the weakest link in the chain is people. If employees, customers, or suppliers do not properly follow security and privacy policies, they could leave the firm at risk. The good news is that security that once was on a company's "backburner" is now paramount in the e-merchant's world. It is beyond a survival expense.

### **THE DAWN OF NEXT GENERATION ENTERPRISES (NGE)**

It is predicted that tomorrow's e-markets will be dominated by a new generation of firm called the Next-Generation Enterprise or NGE. The unique firm combines technologies, structure, and processes to serve customers in Internet time (Schmidt 2000, p. 75). The goal is to build a highly integrated enterprise with seamlessly linked applications to vendors, partners, and others round the clock. Such enterprise application integration (EAI) links together diverse systems and applications across the enterprise and allows the company to respond to market changes online.

One of the early NGE models in 2000 was introduced by American Management Systems (AMS). The theme is that organizations spin out of a pre-integration phase into four levels of maturity in EAI.

See Figure 1. In the pre-integration phase, customers deal with standalone (stovepipe) departments, where the company makes single, non-strategic investments

and limited in its ability to share information or make intelligent decisions.

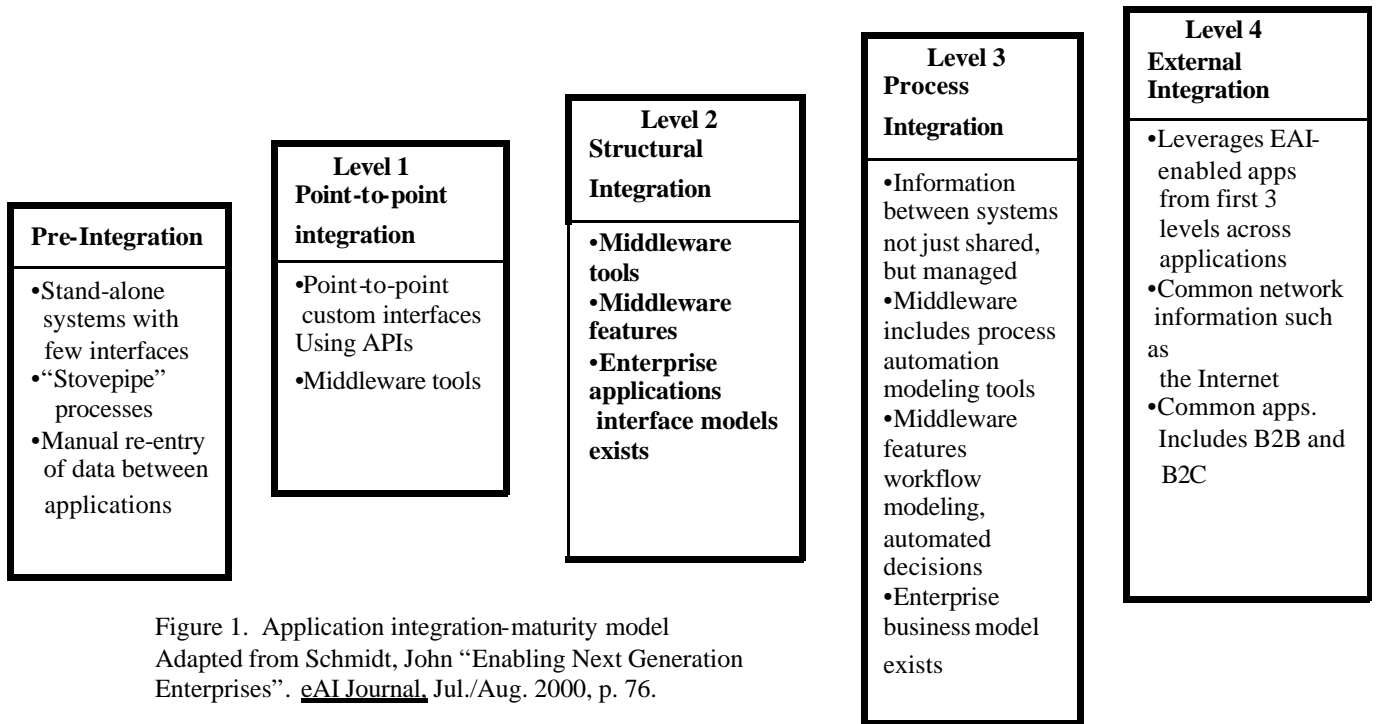


Figure 1. Application integration-maturity model  
Adapted from Schmidt, John “Enabling Next Generation Enterprises”. *eAI Journal*, Jul./Aug. 2000, p. 76.

The four phases of maturation are:

- **Point-to-point integration.** At this first level phase, applications have been transformed from closed to open systems and where sharing information between applications is automatic with minimum manual re-entry. Application Program Interfaces (APIs) are used to provide the point-to-point customer interface. See Figure 2.
- **Structural integration.** At this second level of maturation, advanced “middleware” is used to managing information exchange between applications. This means a common data model to manage all applications. Business rules for interaction between applications are embedded into a structural framework. See Figure 3.

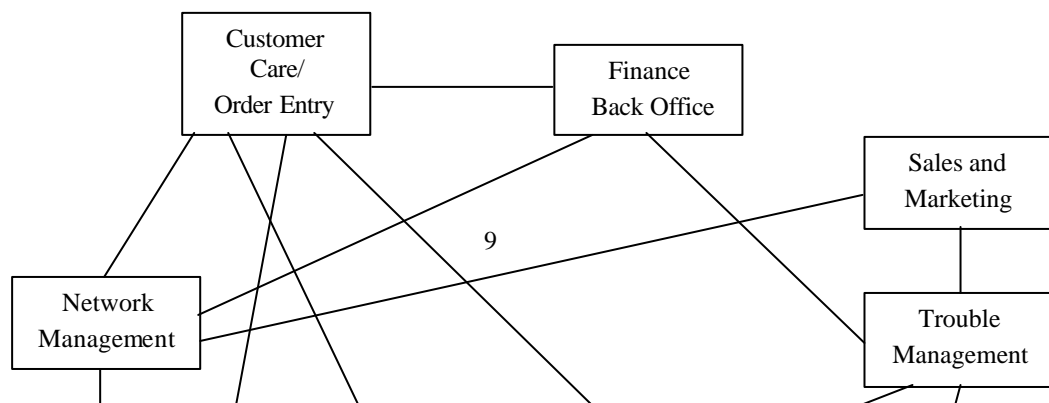


Figure 2. Point-to-point integration

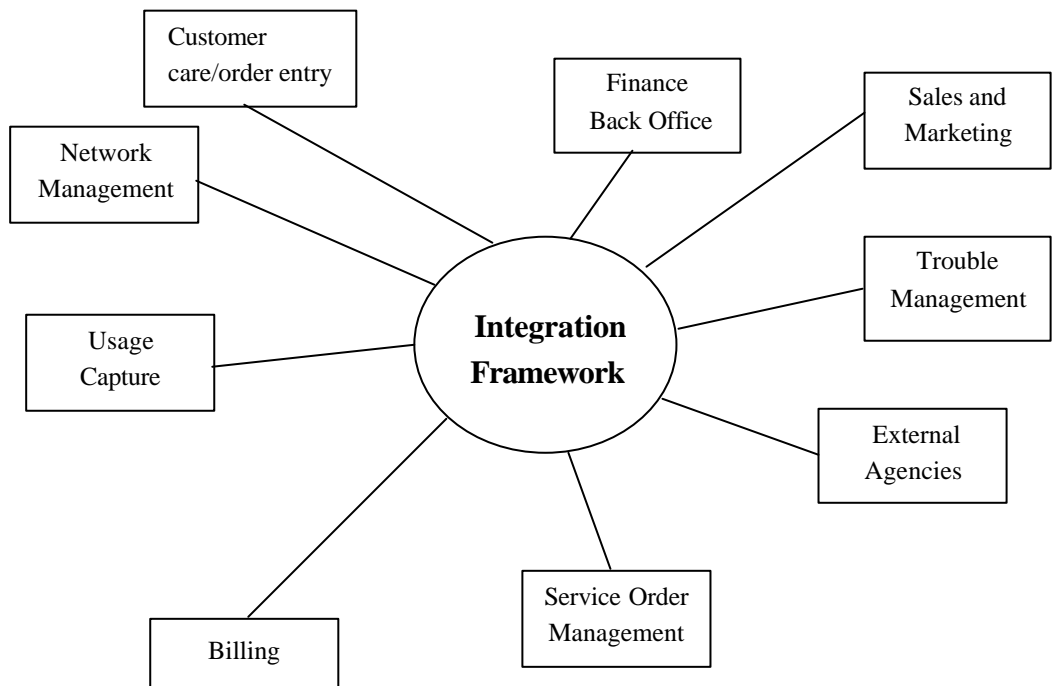


Figure 3. Process Integration

- **Process integration.** This level of maturation ensures that the sharing and managing of information (levels 1 and 2) is made possible through a common business

model that spans the enterprise, using automated workflow functionality and decision-support tools.

- **External integration.** At this level, a company becomes truly NGE, leveraging the necessary technology, business processes unique to the technology, and a new customer-oriented organization structure to implement the change. See Figure 4.

One conclusion of the AMS model is that more and more companies should consider going the NGE route if they are to increase the level of customer satisfaction. Sooner or later, the stovepipe department and closed applications route will not suffice in an increasingly competitive e-business environment. EAI acts as a lubricant that can propel the company to a new level of performance, regardless of market

conditions. Most significantly, EAI has the potential to enhance a company's relationships with the most important contact—the customer worldwide.

Finally, regardless of the model, when it comes to managing e-commerce, every e-merchant must manage risks of automation and uncertainties of the Internet. This means a thorough understanding of the technology in place and the exposures that come up and they should be handled. Minimizing downtime, conflicts, and delays are paramount considerations. In the end, failing to address risk management could be the greatest risk of all for an e-merchant.

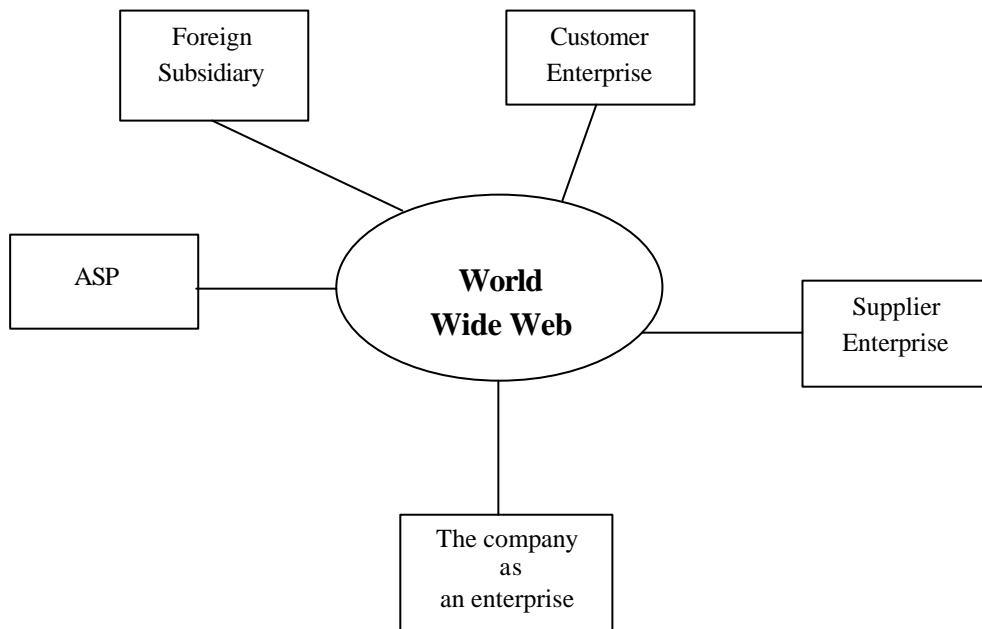


Figure 4. External integration  
Adapted from Schmidt, "Enabling Next Generation Enterprises". eAI Journal, Jul/Aug 2000, p. 75.

### CONCLUSIONS

This electronic way of doing business is made possible because of the Internet's worldwide connectivity to link customers and merchants anytime, anywhere. Although we barely scratch the surface of the many e-commerce initiatives, an attempt was made to use existing e-activities as the basis for future prospects. A number of conclusions can be drawn—some are based on trends and others might be speculative.

One conclusion relates to the growing role of the Internet-based software agents or shop-bots to shop for products, compare prices, and recommend merchant, brand, quality, and best way to ship—all based on requirements that consumers set for them. With the growing interest in “humanizing” bots, it would not be a total surprise if bots soon profile customers, assess their realistic needs, shop for the right product at the right price, and in fact alert the merchant that granting special discount for this customer could pay off in the long run, given the customer's role in the community.

Another conclusion relates to the traditional form of money, which will be altered by Internet transactions as security and privacy problems are resolved and solutions allow for extensive use of digital cash (Deloitte Research 2000, p. 25). E-

commerce also cannot reach its full potential until there are better ways of paying over the Internet. Customers, e-merchants, banks, and credit card companies all have a stake in this issue. When done, consumers will have easier time securing credit, insurance, and the like. Traditional electronic units like ATMs will be connected to the Internet via wireless terminals. Eventually, banking is becoming more dominated by software firms as digital cash becomes a common way of transacting business through technology.

The declining difference between money and software has implications for advancing Internet billing as a replacement for using real money. As shown in Figure 5, over 15 billion bills are sent in the U.S each year, at an average cost of \$1.23 per bill. It is estimated that the current annual billers' cost is well over \$18 billion. In contrast, the billers' Internet billing cost is \$0.35 and the billers' total Internet cost is \$13.5 billion. If one adds \$0.32 postage saved per bill mailed, Internet billing means a total saving of \$4.8 billion per year. Billers who go the Internet billing route stand to gain a unique competitive advantage.

<b>Number of bills sent in the U.S</b>	15,000,000,000
<b>Billers' cost per bill</b>	\$1.25
<b>Billers' current total cost</b>	\$18,750,000,000
<b>Billers' Internet billing cost'</b>	\$0.35
<b>Billers' new cost per bill</b>	\$ 5,250,000,000
<b>Billers' Internet cost</b>	\$13,500,000,000
<b>Billed party postage saved</b>	\$0.32
<b>Billed party total savings</b>	\$4,800,000,000
<b>Total Internet billing savings</b>	<b>\$18,300,000,000</b>

Figure 5. Annual cost of billing on the Internet. Source: Deloitte Research 2000, p. 14.

A third conclusion addresses taxation and how the federal government and individual states will be forced to deal with declining tax revenues. The atmosphere seems ripe for the government to revise the taxation of Internet-based business as companies seek to use the Internet to save money. The increasing tax drain from reduced brick and mortar tax revenues will put pressure on the states to levy state tax on the Internet sales traffic within state territory. Applying these changes on a global scale will undoubtedly have diplomatic and political implications. While we talk about shop bots, the software agents that shop for consumer products and prices could

also be state-generated “tax bots” for collecting state sales tax with each sale.

A fourth conclusion relates to privacy and how much consumers are willing to trade certain privacy for economic gain. Customizing services to individual consumers means obtaining as much information about buyers as possible. Many are concerned that this information will be abused. It is likely that data warehouse specialists will combine it into a consolidated format. It is likely that vendors will respect privileged information by trying to purchase it up front for a certain price. For

example, a company's announcement to issue free PC to consumers who agree to allow the company to make use of their online purchases generated through it is evident of a break in the privacy issue (see [www.free-pc.com](http://www.free-pc.com)). As reported later, a number of consumers have signed on trading certain privacy for economic gain (Deloitte Research 2000, p. 23).

Finally, in a 1999 speech, former vice president Al Gore noted:

*"Today we are drawing up the blueprints for a new economic age, not for starting big institutions, but for freeing small entrepreneurs. We have the honor of designing the architecture for a global economic marketplace, with stable laws, strong protections for consumers, serious incentives for competition—a marketplace to include all people and all nations..We must give consumers the same protection in our virtual mall they now get at the shopping mall (Deloitte Research 2000, p. 24).*

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Just like the United States, other governments that support free enterprise, will find new ways to develop and promote e-commerce. Income taxation of the brick and mortar merchant is based on physical location of the business. With the Internet used for e-commerce, taxing the e-merchant whose Web servers can be anywhere makes the taxation issue a real problem. In any case, as long as taxation is a core source of government revenue, e-merchants have no choice but to factor it as part of doing business.

In the final analysis, for e-commerce to succeed, some of consumers' fears must be addressed. Two-thirds of online transactions are cancelled or abandoned before they are completed, because the shopper would not provide a phone number or an address. Over 90 percent would not provide information about income and 85 % said they would not provide credit card information. These responses deal with the need for trust in the e-commerce market. New ways must be found to establish trust and data protection (Deloitte Research 2000, p. 21)

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