MINTING CYBERMONEY

Jobs, Electronic Commerce, and Opportunity for Vermont

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Telecommunications Education and Training

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Executive Overview

The Internet-based electronic commerce engine is an economic juggernaut that appears to be taking on a fiduciary life of its own. Obviously, any time money is involved, things seem to go better and faster. In spite of the fact that there is a significant lack of public trust of the Internet and that PC household penetration rates remain relatively low (approximately 39% at last count), E-commerce continues to evolve at an unprecedented rate.

Clearly, the medium has significant advantages over traditional purchase and payment mechanisms. It is universal; it is remarkably inexpensive to implement, operate and maintain; it allows for a considerable reduction in overhead, both human and otherwise; it is, in spite of all the hype, remarkably secure; and perhaps most important of all, it allows access to a market that is almost unmeasurable.

It goes without saying, of course, that there are still barriers in the road to complete implementation, and those barriers will take some time to overcome. The Internet commerce game is still new and the rules have not yet been completely formalized. The players are still groping for position in the market and have yet to discern the best way to stay in the game. Many of the companies that are well known in the real world have established a Web presence for themselves, yet in many cases their sites don't reflect who they actually are. The marketing effort still has a ways to go.

Equally important is the issue of payment mechanisms. Ultimately, all Internet purchases will involve a credit card in one way or another, but to make the process as safe, anonymous, and universal as possible, a number of companies have crafted solutions that make it possible for any merchant to accept any credit card. In effect, the cybermoney model reflects the cash model of the real world. Driven by a few niche players—adult entertainment, flowers, and computer hardware and software, specifically—these electronic payment options are becoming accepted and trusted mechanisms for Internet commerce activities.

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Today, there are an estimated 5000 Internet service providers (ISPs) in the United States. If the prognostications of highly respected analysts who watch our industry prove to be accurate, by 2001 the herd count will be winnowed to less than 100. If they are to be believed, those that remain will have names like BellSouth, SBC, Bell Atlantic, AT&T, Sprint, and Worldcom. The intense activity being undertaken by the ILECs and IECs is a testament to the level of commitment that they have made to the Internet marketplace. They will survive as players in the grand game because they understand both the rules of the game and the players in it, as well as their own evolving role. Additionally, they all have well deployed, highly functional, superbly managed, and richly connected networks—a major piece of anybody's service offering.

Finally, if the Internet marketplace is to grow into a true, mainstream phenomenon, its market players—and therefore, the marketing efforts that those players will respond to—must be well understood. The standard marketing and advertising techniques used in television, radio, and print media simply won't work because the Internet is a very different environment with different "viewer response" characteristics.

This book explains the burgeoning phenomenon of electronic commerce including its growth history, the key markets and the players in them, the security and payment mechanisms that make it work, and the challenges that still face it.

Introduction to Electronic Commerce

This document is divided into three sections, as follows: Overview and Evolution of Electronic Commerce; Electronic Commerce Applications and Payment Mechanisms; and Outstanding Issues and Final Thoughts.

SECTION DESCRIPTIONS

Part I examines the evolution of E-Commerce; the roles of both the Internet and the World Wide Web; the breakdown, by industry, of commercial Web usage; the advantages that E-Commerce brings to both buyers and sellers; and the near- and long-term impacts of E-Commerce on traditional markets.

Part II considers E-Commerce applications, with attention on a wide range of industry types to illustrate the breadth and depth of the E-Commerce phenomenon's market penetration. This section also examines success factors, barriers to success, responses by various industry groups to those barriers, and the actual status of E-Commerce today.

Part II goes on to delve into the tangled web of E-Commerce payment mechanisms. We often observe in this industry that "the nice thing about standards is that there are so many to choose from." Well, E-Commerce is no different. A plethora of techniques have emerged as proposed industry standards for transacting online commerce; this section compares them in terms of functionality, security, deployment status, and ease of use. The section concludes with an examination of Electronic Data Interchange, or EDI, a long-standing contender in the E-Commerce family of possibilities.

Part III considers the many unresolved issues that remain along the road to commercial success of electronic commerce. These include regulatory and legal issues, market access considerations including advertising, and the status of enabling legislation.

Part III concludes the course with an overall summary and a collection of supplementary materials.

Embedded throughout this document are questions designed to make participants consider the issues that they address. They appear in a column on the left of the text. They are not to be answered as assignments, but participants should spend some time thinking about them. Some of the questions might be selected to appear in the Discussion List, which is detailed in the Course Syllabus.

Electronic commerce is an economic juggernaut that will not be stopped. The market has spoken: E-Commerce will live. Do we know how big the market is? Absolutely not, but we do know that it is very large, very dynamic, and getting bigger all the time. And since growing markets attract customers, E-Commerce is a good place to be. Remember, the best way to become a leader is to find a parade and get in front of it. Be careful: this is a fast moving parade and the slow or unwary will be crushed. So, know before you go.

Overview and Evolution of Electronic Commerce

E-Commerce has grown from being a hazy "vanity concept" first trotted out in the early 1990s to a burgeoning marketplace that generates somewhere between $500M and $1B per year in online transactions, extends its tentacles into virtually every marketplace on Earth, and is in the process of redefining such staid, well-established institutions as advertising, banking, and minimal market margins. It is interesting that of the hundreds of thousands of companies that have designed and placed Web sites online, two-thirds of them have less than 100 employees. This is not, therefore, the exclusive domain of big business. It is, however, the domain of big revenues. For example, Sportzone <http://www.sportzone.com> has more than 40,000 subscribers from whom it exacts $5 per month for access. And whether social norms like it or not, adult entertainment generates a whopping $52 million in online revenues every year.

WHAT IS ELECTRONIC COMMERCE?

Two anecdotes come to mind in answer to this question. The first recalls a recent Senate subcommittee hearing on pornography, during which a senior Senator was asked to define exactly what it was that constituted pornographic material. He thought for a moment (and fumbled a bit, I might add) then responded, "I can't define it, but I know it when I see it."

The other anecdote derives from the allegory of the five blind men and the elephant in which five blind men were asked to approach an elephant, examine it, then return with a description of the beast. Naturally, each of the men grabbed a different part of the elephant: one grabbed his fanlike ear, another his postlike leg, another a tusk, the fourth his broad, flat side, and the last his ropelike tail. And naturally, each of the five men came back with completely different descriptions of an elephant.

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Electronic commerce, too, is different things to different people. To some, E-Commerce is nothing more than the process of ordering something by phone from a mail order distributor, faxing a lunch order to the local eatery, or ordering a pizza from Pizza Hut via the Web <http://www.pizzahut.com>. To others, it is industrial EDI transactions between automobile manufacturers and the thousands of vendors they interact with every month, or a telephone company billing record sent in electronic form to a large customer in lieu of a thousand page paper invoice.

All of these represent electronic commerce of a sort, but the most recent and exciting E-Commerce technique relies on: the Internet as its transport scheme; the World Wide Web as its delivery platform; a variety of transport mechanisms including the Hypertext Transfer Protocol (HTTP) and its secure cousin (S-HTTP); the Internet protocol suite, TCP/IP, to ensure proper message delivery; and an emerging collection of payment methods to provide secure, immediate, effortless transaction capability, using either standard credit and debit cards or emerging forms of "cyber currency."

Security emerged as a concern as soon as E-Commerce began to put roots into the fabric of traditional payment methodologies. The Internet hit the mainstream in the early 1990s, draped in mystique and accompanied by a host of preconceived notions, one of them the absolute belief that it is an electronic form of the Old West, a sort of cyber Dodge City, and therefore an unsafe, lawless place. This image has caused, and continues to cause, electronic commerce's growth to be retarded because people simply don't trust the environment in which it operates. There is an irrational fear, founded largely in ignorance, that there is a hacker out there on a phone pole just waiting for a credit card number to go zipping by that they can steal on the fly and use to purchase a trip to Rio de Janeiro. Let's take a moment to examine those fears.

First of all, the Internet is *not* a lawless community. True, there is no "cyber police force" that governs activities on the Net, but that is by design. The environment is self-policing and it does that very effectively. Offenders of commonly accepted Internet behavior, often called *netiquette*, are quickly dealt with in a variety of innovative ways ranging from account closure by the ISP to flaming—being on the receiving end of large quantities of inflammatory messages.

Second, the idea that a hacker is sitting out there just waiting for *your* credit card to whiz by is not realistic. It's certainly possible, but it requires a targeted attack against *you*, by a determined attacker with a protocol analyzer and the ability to monitor *your* access line to obtain your packets. Most hackers (according to law enforcement statistics, boys, average age 16) don't do that.

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Third, credit card liability, usually $50, is the same whether the purchase is made in a furniture store or over the Internet.

Finally, when a customer purchases something in a department store using a credit card and the clerk slides the card through the Vericard machine to authorize the purchase, where does the customer think the information goes? To the desk of a green eyeshade-wearing accountant in the basement? Of course not. The information, *the bitstream*, leaves the building and travels over the same telephone company circuits that the Internet uses. So the notion that the Internet's pathways are less secure than any other is spurious. The seeds have been planted, however, and it will take significant effort to overcome the notion that the Internet is the last place a credit card should be used.

One group of E-Commerce realists likens the phenomenon to the California Gold Rush of 1848, when gold was discovered at Sutter's Mill near Sacramento. Miners swarmed over the grass covered hills to stake their claims, and while some of them found riches, most went unrewarded. One group of entrepreneurs, however, did extremely well. They were the business people who ran the hotels, saloons, general stores, and brothels in Murphys, Angels Camp, Placerville, Malakoff Diggins, and other towns that sprang up to provide succor and sustenance to the miners. Throughout the course, it would be wise to keep this model in mind. Who are the miners and who are the merchants in the electronic gold rush?

WHY ELECTRONIC COMMERCE?

As we will see, E-Commerce opens up a vast new realm of business possibilities for individuals and companies, but for the moment, consider the following examples. Recently, the WALL STREET JOURNAL <http://www.wsj.com> created a Web site and began to sell its daily newspaper online. The interesting thing is that while an annual subscription to the *paper* version costs approximately $175, the electronic edition only costs $49—unless, of course, the subscriber also gets the paper version, in which case the subscription is $29. Clearly, online service provisioning is a cost-effective option.

Banking is another industry that has benefited from E-Commerce. It is a well-documented fact that a deposit transaction handled by a teller costs approximately $1.07. The same transaction conducted at an ATM machine costs the bank 26¢, but if done electronically via the Internet, it costs a mere 3¢—clearly something that will catch the attention of a frugal banker.

Electronic commerce affects all industries today for many of the same reasons that have driven it into banking and publishing, but there are other reasons as well: the "David and Goliath" effect; "pay

Ask five friends or classmates if they have ever purchased anything over the World Wide Web. If not, find out why not. What were their reasons?

Why would the WALL STREET JOURNAL sell the electronic edition of its daily paper for less than the printed edition? Why do so many magazines publish free online versions of their journals and magazines? How do they cover the cost?

no attention to that man behind the curtain" (the Wizard of Oz effect); "the Death of Distance"; and finally, the "bits vs. atoms economy" described by Nicholas Negroponte in his book, BEING DIGITAL.

The David and Goliath effect says simply that the World Wide Web and the Internet have the ability to disguise the actual size of a company, forcing potential customers to consider their product rather than their storefront. The Internet-based Amazon.com Bookstore <http://www.amazon.com>, for example, advertises itself as being the world's largest bookstore, with more than 2,500,000 books "in stock." In fact, there is no Amazon Bookstore; their "store" is nothing more than a collection of servers in a closet somewhere, and all books are drop-shipped directly from the publisher to the customer. Therefore, they have no actual overhead, but still appear to be an enormous company.

The "pay no attention to that man behind the curtain" effect is related to the phenomenon discussed above. It observes that the Internet has the ability to convey a sort of transparency to cyberspace entities, in the sense that it can equalize the size and breadth of all companies, regardless of actual size. This is both good and bad. It means that a company can instantly become a player in the game of global economics; however, as the famous adage warns, be careful what you wish for because you might get it. A ladder manufacturer in the Pacific Northwest of the United States decided that it would be good for his business to have a Web page, so he had one created and put online. His market, which formerly had been the Seattle, Washington and Portland, Oregon areas, suddenly became—the world. When orders started to come in from places like Sri Lanka and Mozambique, he realized that he had made an error because shipping a 24 foot extension ladder halfway around the world is not a trivial, or inexpensive, task. The World Wide Web is a binary environment: you're either on it, and globally reachable, or you're not. There is no in between.

There's a famous cartoon that originally appeared in the *New Yorker* Magazine several years ago that illustrates this phenomenon quite nicely. In it, two dogs are sitting in front of a personal computer, one of them typing on the keyboard. He says to his canine companion, "On the Internet, nobody knows you're a dog," certainly suggesting the wonderfulness of this new technology.

Telecommuting has been discussed for a very long time. Does the popularity of the Internet help or hinder it?

The Death of Distance derives from an article of that name that appeared in *The Economist* magazine <http://www.economist.com.uk> in September of 1995. Also related to the two phenomena discussed above, it simply notes that with the Internet and World Wide Web, to a large extent it no longer matters where a company is physically located because they can have a universal cyberpresence by taking

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advantage of the universal distributive abilities of the network. This stands to have a profound impact on human resources issues because many companies will be able to locate their offices in close proximity to the best labor pool, or the area with the best standard of living for their employees, or even be physically separated from their employees owing to the fact that the Internet eliminates many of the negative elements of distance. The ever-increasing focus on telecommuting stands to benefit from this as well, meaning that the relationship between companies, employees, and jobs may well have to be re-examined.

A significant barrier to the implementation of electronic music distribution emerged early on in the trials that had nothing to do with the technology itself—in fact, the technology has been trialed quite successfully in a number of stores. Can you guess what it was and how it was resolved?

Nicholas Negroponte is the Director of MIT's Media Lab. In his recent book, BEING DIGITAL, Negroponte observes that we are evolving into a world where money is made by shipping bits around rather than by shipping atoms. Naturally, we still have to physically truck lettuce and strawberries out of California's Central Valley, iron ore out of Montana on train cars, and seafood out of Mexico in airplanes, but more and more, companies are making money by creating, formatting, analyzing, and selling information in the form of bitstreams. Companies like Blockbuster are investing significant amounts of money into technology that will allow them to receive a request for a music CD from a customer at a kiosk, then burn the CD and print the jewel box label while the customer waits. Consider the implications for the music industry.

- Titles will never go out of stock again.

- No physical inventory, but limitless virtual inventory.

- No shrinkage.

- More efficient shipping raw material.

- No employees.

- *No stores!*

There is, of course, a downside. According to a recent survey conducted by Nielsen <http://www.commerce.net/nielsen/index.html>, 64% of all Internet users access the Net less than five hours every month, and most of that is for e-mail, not shopping. If we assume the numbers cited earlier to be correct, we conclude that 64 million people are online less than five hours per month. That's not much "face time" for a would-be online retailer to take advantage of, particularly when the same study concludes that the bulk of that five hour block is used for electronic mail.

WHAT IS THE INTERNET?

The Internet is a vast network of networks and is recognized as the fastest growing phenomenon in human history. In the words of

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Douglas Adams, author of A HITCHHIKER'S GUIDE TO THE GALAXY, the Internet is a lot like the cosmos: "It is big. Really big. Vastly, hugely, mind-bogglingly big." Not only that, it is getting bigger. The Internet doubles in size roughly every ten months as new networks and hosts are added, and that growth rate is expected to continue until well after the turn of the century, with most of the bulk occurring outside of the United States.

Not only is the Internet global in physical scope, it is universally recognized. Everybody knows about the Internet. In 1993, it came booming into public life, put down deep roots, and flourished. Like other famous public figures, it has been on the cover of every major journal and magazine in the world, has been the favored subject (and star) of books, articles, TV shows, and movies, has been lauded as the most significant positive social force in centuries, and debased as the source of a plethora of worldwide ills. And yet, for all this fame and notoriety, little is actually known about the Internet itself—at least, its private side. It is known to be a vast network of interconnected networks, with new ones connecting *approximately* every ten minutes. According to the Network Wizards' Internet Domain Survey <http://www.nw.com>, it connects *approximately* 20 million host computers, provides services to *somewhere between* 50 and 100 million users, and comprises *roughly* 100,000 interconnected networks worldwide. And while the Internet is routinely praised as the modern and electronic equivalent of the Great Library at Alexandria, others have a slightly different point of view. Often seen as a great pirate's chest filled with the bullion and riches of information wealth, that view may be slightly skewed. Some see the Internet as being more like an enormous city dump—as long as the user is willing to put on their digital hipboots, silicon waders, and electronic gloves, and dig through a lot of online garbage, they'll find the occasional jewel. But, their success rate will only be as good as their shovel, and their map of the dump.

WHY USE THE INTERNET?

In spite of all this, the Internet has enjoyed attention from many corners. And in spite of its detractors, there are good business reasons to use it. It has become a central mechanism for vendor, product, and customer support; product distribution; collaborative product development; and joint product research. These activities are not trivial: half of the largest publicly held companies on Earth have a presence on the Internet, including more than 500 companies that enjoy sales in excess of US $1.5 billion.

In this example, what is the shovel? How about the map?

Using your Web browser, go out onto the Internet and visit the home pages of five large corporations. Once you have found them, make a determination as to the role that each Web site plays in each company's corporate strategy, and whether the site contributes tangibly to corporate earnings. If so, how? (Note: GCK's Miscellaneous Sites List, located at the Hill Associates Web site, can help you select corporations for this exercise.)

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WHAT IS THE ROLE OF THE WORLD WIDE WEB?

The World Wide Web was first conceived by Tim Berners-Lee <http://www.cern.org.ch>, considered by many to be the "Father of the World Wide Web." A physicist by training, he worked in the computer and telecommunications industries following graduation from Oxford, and eventually accepted a consulting position as a software engineer with CERN during the late 1970s.

Illustration courtesy of Ernst & Young

During his stint in Geneva, Berners-Lee observed that CERN suffers from the problems that plague most major organizations: information location, management, and retrieval. CERN is a research organization with large numbers of simultaneous ongoing projects, a plethora of internally published documentation, and significant turnover of people. As a consequence, Berners-Lee found that his ability to quickly locate and retrieve a particular piece of information was seriously impaired by the lack of a single common search capability. To satisfy this need, in 1980 he wrote a search and archive program called *Enquire. Enquire* was never published as a product, although both Berners-Lee and the CERN staff used it extensively; however, it did prove to be the foundation for the World Wide Web.

In May of 1990, Berners-Lee published INFORMATION MANAGEMENT: A PROPOSAL, in which he described his experiences with hypertext systems and the rationale for Enquire. He described the system's layout, feel, and function as being similar to Apple's Hypercard, or the old "Adventure" game where players went from "page to page" as they moved through the game. Enquire had no graphics, so was rudimentary compared to modern Web browsers, but it did run on a multiuser system and could therefore be accessed simultaneously by multiple users. To satisfy the rigorous demands of the CERN staff, he designed the system around the parameters listed below.

■ It had to offer remote access across a diversity of networks.

■ It had to be system- and protocol-independent, since CERN was home to a wide variety of system types—VM/CMS, Mac, VAX/VMS, and UNIX.

■ It had to run in a distributed processing environment.

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- It had to offer access to all existing data types as well as to new types that would follow.

- It had to support the creation of personal, private links to new data sources as each user saw fit to create them.

- It had to support, in the future, diverse graphics types.

- It (ideally) had to support a certain amount of content and data analysis.

In November 1990, Berners-Lee wrote and published, with Robert Cailliau, *World Wide Web: A Proposal for a Hypertext Project*. In it, the authors described an information retrieval system in which large and diverse compendia of information could be searched, accessed, and reviewed freely, using a standard user interface based on an open, platform-independent design. This paper relied heavily on the paper that Berners-Lee published earlier, *Information Management: A Proposal*.

In this second paper, Berners-Lee proposed the creation of a "World Wide Web" of information that would allow the dispersed CERN entities to access the information that they need, based on a common and universal set of protocols, file exchange formats, and keyword indices. The system would also serve as a central (although architecturally distributed) repository of information, and would be totally platform-independent. Furthermore, the software would be available to all and distributed free of charge.

Once the paper had been circulated for a time, the development of what we know today as the World Wide Web occurred with remarkable speed. The first "system" was developed on a NeXT platform. The first general release of the WWW inside CERN occurred in May of 1991, and in December, the world was notified of the existence of the World Wide Web (known then as W3) thanks to an article in the CERN computer newsletter.

Over the course of the next few months, browsers began to emerge. Erwise, a GUI client, was announced in Finland, and Viola was released in 1992 by Pei Wei of O'Reilly & Associates. NCSA joined the W3 consortium, but didn't announce their Mosaic browser until February of 1993.

Throughout all of this development activity, W3 servers, based on the newly released Hypertext Transfer Protocol (HTTP) that allowed diverse sites to exchange information, continued to proliferate. By January of 1993, there were 50 known HTTP servers. By October there were over 200 and WWW traffic comprised one percent of aggregate NSF backbone traffic. Very quietly, the juggernaut had begun.

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In May 1994, the first international WWW conference was held at CERN in Geneva, and from that point on they were organized routinely, always to packed houses and always with a disappointed cadre of oversubscribed would-be attendees, left out in the cold.

From that point on, the lines that clearly define "what happened when" begin to blur. NCSA's <http://www.ncsa.com> Mosaic product, developed largely by Marc Andréessen at the University of Illinois in Chicago, hit the mainstream and brought the World Wide Web to the masses. Andréessen, together with Jim Clark, would go on to found Netscape Corporation shortly thereafter.

And today? Today, the World Wide Web is much more than a technology. It is a world, a culture, and a massive vertical industry that provides form and sustenance to countless, dependent sub-industries. According to Internet Society <http://www.isoc.org> statistics, the amount of information that is available on the Web doubles in volume approximately every 50 days, and the number of hosts with the name "WWW" has grown nearly exponentially. According to Network Wizards, in July of 1995 there were 17,000 hosts called WWW (including WWW1, WWW2 and WEB); in January 1996, 76,000; in July 1996, 212,000; and in January of 1997 the number had grown to an almost unbelievable 771,000. In fact, HTTP traffic accounts for more than 50% of all the traffic sent across the Internet today.

And who uses the World Wide Web? According to a study of people over the age of 16 in the United States and Canada conducted jointly by CommerceNet and Nielsen Media Research at the end of 1996, 23% use the Internet regularly, and of those, 76% use the Web for product research. Furthermore, more than 5.6M people used the Internet and World Wide Web to make an online purchase in the month preceding the interview.

Perhaps Vinton Cerf, co-creator of TCP/IP, described the Internet's evolving role as it relates to E-Commerce most accurately when he observed that this is a three phase evolution. Initially, he noted, we connect computers together to allow them to share data. In phase two, we allow people to connect to online advertising and information, thus raising the visibility of the technology. Finally, in phase three, we connect business processes together, potentially on a global, inter- and intracorporate basis. Then and only then will the true promise of the Internet and electronic commerce be realized.

WORLD WIDE WEB PRESENCE, BY INDUSTRY

Many industries are represented on the Web, but a small number of them have surfaced as the dominant online presence.[1]

Visit the Internet Society's Web site and review the current usage statistics posted there. What must be considered with regard to the Internet backbone and access methodologies if this growth is to continue unabated?

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[1]Yurman, D., *Internet Markets*, On the Internet, Jan/Feb 1997.

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- Computer products (27%)

- Travel Services (24%)

- Adult Entertainment (10%)

- Apparel (9%)

- Gifts and Flowers (9%)

- Food and Drink (8%)

- General Entertainment (7%)

- Other Miscellaneous (7%)

As diverse as these industries are, the applications they run on the Internet/Web fall into a relatively small group. They include product marketing; dissemination of product and company information; posting and distribution of research reports and white papers; technical and nontechnical customer support services; product sales; software distribution; and bill payment. These are not new services, but the manner in which they are performed is. Software updates over the Internet, for example, allow the customer to download the appropriate device driver or software module whenever they find it convenient to do so, from wherever they happen to be. They don't have to make a phone call, wait in queue, or talk to anyone. In essence, the customer does all the work, yet they perceive that they are receiving better service because it is being delivered on their terms!

In short, this technique provides innovative ways for companies to deliver information, services, and technology to an ever-widening customer base. Because the service provided is "asynchronous," that is, delivered whenever the customer wants rather than at predetermined times, it provides a new way for companies to stay in touch with existing customers, find new ones, cut their contact costs, and shorten product delivery cycles.

STAYING CLOSE TO THE CUSTOMER

In Tom Peters' seminal management text, IN SEARCH OF EXCELLENCE, he observes that customer service is the single most distinguishing factor when it comes to differentiating one company from another. The book is filled with anecdotes that document both successes and failures based on that pretext.

> Probably the most important management fundamental that is being ignored today is staying close to the customer to satisfy his needs and anticipate his wants. In too many companies, the customer has become a bloody nuisance whose

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Using the list of Uniform Resource Locators (URLs) provided in the Appendix, GCK's Miscellaneous Sites List at the Hill Associates Web site, or other companies that you are familiar with, find two examples of companies that use the Internet/World Wide Web to do each of the following:

- **Marketing**

- **Dissemination of company information**

- **Distribution of research reports and white papers**

- **Online customer support**

- **Product sales**

- **Software distribution**

- **Bill payment**

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unpredictable behavior damages carefully made strategic plans, whose activities mess up computer operations, and who stubbornly insists that purchased products should work.

Any opportunity to position a company closer to the customer, to demonstrate to the customer the willingness on the part of the company to do whatever it takes to satisfy the customer's requirements, is an opportunity not to be missed. The Internet and World Wide Web, as delivery media for customer service, are crucial success factors in many cases. This, of course, brings us to electronic commerce. If a company can advertise itself and its wares on the Web, collect customer information on the Web, and ensure that its products are exactly what the customer wants, why shouldn't it sell products on the Web?

ADVANTAGES OF E-COMMERCE

In short, then, the advantages of electronic commerce are quite real. They include access to a worldwide marketplace with millions of potential buyers and hundreds of thousands of products and services; universal referral and directory services; and a broad variety of capabilities that include online catalogs, product demonstrations, online bidding, ordering, and invoicing services, and question and answer databases (also known as *knowledge bases*). Ultimately, the result is improved customer service, and in the near term, those customers can look forward to improved customer-corporate communications, reduced purchasing and support cycles, reduced product development cycles, and a significantly improved (and accelerated) procurement process.

In the long term, those same customers can look forward to improved market presence for small businesses, thanks to the Wizard of Oz effect and the Death of Distance; steady, sustained growth in online access and information services; innovative growth in such areas as niche publishing and related businesses; and significantly increased granularity in vertical industries.

Those businesses will also be asking a lot of questions because the advent of electronic commerce is psychologically new territory for most. As P. Panurach observes in *Perils and Pitfalls of Practical Cybercommerce*,[2]

> Transforming money from bills…into charged electrons…is probably a greater abstract leap than the transformation of gold coins to flat currency.

There is a significant trust issue at work here, just as there must have been when the first paper currency emerged. E-Commerce also begs

[2]Communications of the ACM, June 1966.

another critical question: What are the system's auditing capabilities? Are they valid? Are they foolproof? Will professional auditors accept the accounting data provided by electronic commerce systems, or will they fear that this new system provides nothing more than a largely invisible, high-tech way to cook the books?

Furthermore, will the lower production costs brought about by electronic commerce translate into reduced consumer costs? Will it open new markets for those consumers? And what about management and oversight? Will electronic commerce require a new kind of central oversight authority to ensure that commercial activities are conducted legally? After all, one famous quote observes, "The Internet is a lot like anarchy, except it's a lot less organized." Is this the system we want to build our commercial application upon? And what about taxation? How will it be done? Should it be done?

As the realm of Internet-based electronic commerce solidifies, we begin to see that Marshall McLuhan's Global Village is real, and that to a very large extent, national borders will disappear. Witness what has already happened in Europe and is beginning to happen in North America. This is a good thing, but it brings about a whole new set of issues, such as sovereign law: what's legal in one country may be illegal in a neighboring country. Furthermore, we may begin to see clashes of social mores. Consider the fact that the Internet is highly suspect in many countries such as Germany, Singapore, and China. Will its arrival and penetration help to assuage the friction that is inevitable in culture clashes, or will it exacerbate the problem?

And what about trade barriers? There are those who believe that the Internet will help to eliminate exclusive markets and open markets that have traditionally been geographically closed. Is this good?

Consider the issues discussed in this last section. What other concerns will surface as the influence of electronic commerce and the pervasiveness of the Internet continue to expand? Is there a downside to Internet-based electronic commerce? Why or why not?

PART II

Electronic Commerce Applications and Payment Mechanisms

In this section, we will examine a cross-section of the industries that have arisen to take up the banner of electronic commerce, as well as the applications they have created and payment mechanisms they have devised. These industries include financial services, health care, publishing and broadcasting, travel, marketing and advertising, human resources and career guidance, shipping and delivery services, plus a variety of "generic" industries have emerged as E-Commerce supporters, including catalog companies, computer hardware and software manufacturers, news services, business-to-business sales, government, and customer service specialists.

We will examine many of these industries and their applications, and will use their Web presence to determine the extent to which they employ E-Commerce. Exercises at the end of the section will help participants assess the relative effectiveness of each company's E-Commerce efforts.

CATALOG SHOPPING

According to a recent article in the SAN DIEGO BUSINESS JOURNAL, consumers spent $50 billion on catalog purchases in 1996. That number includes online purchases, call center contacts, and mail order. As might be expected, the online revenues are the smallest of the three, but that is not expected to continue, given the intense interest in Internet-based commerce.

L.L. Bean <http://www.llbean.com> of Freeport, Maine offers a good example of E-Commerce done well. The company routinely sends out tens of thousands of printed seasonal catalogs, which generate enormous revenues for the corporation. The upper floor of their massive showcase store in Freeport is a call center, where operators accept orders from the current season's catalog.

There are a couple of disadvantages to this model. First of all, customers are free to place orders with the company, but only for items listed in the current season's catalog. Second, customers must often remain on hold for long periods of time, especially during busy periods. Third, if L.L. Bean inadvertently prints a catalog with an error in it, there is no way to correct the error after the catalogs have been distributed.

The company's E-Commerce-based Web site resolves all of these challenges. First of all, customers can order *any item from any of the current year's catalogs*—not just from the current season's offerings. Second, there is no online wait time. Customers access the site from their browsers, examine the items they're interested in, and place their orders whenever they're ready. Finally, if an error sneaks into the online database, it can instantly be corrected.

Another intriguing online company is Buy IT Online <http://www.buyitonline.com>, a catalog and shopping services clearinghouse. This company provides a unique service in that they not only allow customers to search a variety of catalogs, they also allow them to search by price range, by keyword, by product category, and even by whether they offer secure electronic commerce capability or not. Again, here is an example of a company that has taken the relatively straightforward online shopping capability to the next level.

COMPUTERS AND SOFTWARE

It should be clear that most companies use the Web as a sort of "electronic business card." It is a terrific advertising and marketing medium, but it has the ability to be much more than that. Microsoft <http://www.microsoft.com>, Symantec <http://www.symantec.com>, and Netscape <http://www.netscape.com>, for example, use their Web sites as a central point for customer contact. From their sites, they distribute software patches and updates, provide technical support through e-mail and FAQ lists, send out product information and announcements, test beta versions of new product releases, and generally improve their presence in front of their customers. It is interesting to note that if a customer needs a software patch, they go to the appropriate site and download the software themselves (with zero human interaction). And several studies indicate that even though the customer does all the work, and the supplier can reduce staff as a consequence, the customer perceives better service!

CompUSA <http://www.compusa.com> and Egghead Software <http://www.egghead.com> offer similar services; they allow customers to browse online catalogs, make purchases, and select from a number of shipping options, never having to wait on hold for an operator or service representative.

Can you think of an industry or industries that would be better off not having an online presence? Why?

What do you suppose is involved in setting up a service/company like Buy It Online? How do they make money?

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According to a recent article in the WALL STREET JOURNAL, Dell Computer Corporation <http://www.dell.com> sells more than $3M worth of merchandise through their Web site *every day*. They are one of the most successful users of Web-based electronic commerce in the world, largely because of the service they actually provide. Customers who log onto their site can "build" their machine online, configure it as they see fit, watching the price tag closely as they add components. Online Help functions allow them to resolve conflicts or ask questions; when they have what they want, they can place a secure order instantly and the machine ships the next day. Furthermore, Dell utilizes the "just-in-time" manufacturing concepts to the systems they sell; they have no preconfigured machines, but build systems as orders come in (both electronically and via more traditional sales channels).

NEWS SERVICES

Will growth in online news services have any tangible impact on the printed word?

Most broadcast agencies have Web sites that are used to advertise their organizations' services, but some have gone to the next step. National Public Radio, for example, broadcasts its content over the Internet, using RealAudio as the protocol and reception mechanism. Others, such as CBS News Up-to-the-Minute and MSNBC <http://www.msnbc.com>, offer similar services; ESPN Sportszone <http://www.sportzone.com> (a Starwave and Disney offering) and CNN Interactive provide much the same.

Representing the print medium, there are hundreds of online newspapers, magazines, and journals. The NEWS AND OBSERVER TIMES <http://www.nando.net>, the SAN JOSE MERCURY NEWS, USA TODAY <http://www.usatoday.com>, the WALL STREET JOURNAL, WIRED <http://www.wired.com>, and many others have online versions of their publications; while they enjoy a certain level of daily online readership, the most popular service they provide seems to be the online classified advertisements. The WALL STREET JOURNAL offers an additional level of customer service; they allow online subscribers to "customize" their newspaper. They give readers the ability to arrange the order in which different sections are presented, and to search for certain keywords in published articles.

BUSINESS-TO-BUSINESS SALES

It is widely believed that Internet-based E-Commerce in the form of business-to-business sales will reach the $7 billion level by the year 2000. And while much of this growth is believed to stem from the growing popularity of E-Commerce, most industry analysts cite the current widespread use of Electronic Data Interchange (EDI) as a key causative factor. Many industries today, including telephone, chemical, and automotive, use EDI applications for ordering, payment,

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inventory control, and other financial purposes. Additionally, privately owned EDI networks have become widespread, furthering the acceptance and trust of electronic commerce applications. In 1995, there were about 64,000 companies using EDI as part of their business routine; by 2000 there will be more than 500,000, with significant growth occurring in Asia.

GOVERNMENT

Between November 1996 and March 1997, the Social Security Administration <http://www.ssa.gov>, in concert with the Pitney-Bowes Corporation <http://www.pb.com>, conducted an E-Commerce trial designed to test the feasibility of electronic submission of corporate W-2 and W-3 forms. The trial comprised less than 100 companies, the largest of which was Hill Associates <http://www.hill.com>. All were located in the northeast (most of them in Maryland and Connecticut). The trial was successful and the potential for millions of saved administrative dollars was quite real.

CUSTOMER SERVICE

Customer service and electronic commerce have an interesting relationship with one another in that customer service is the most important advantage that E-Commerce brings, while at the same time, customer service could bring on E-Commerce as an offshoot of a company's drive to be more customer focused. Customer service is a common theme in all E-Commerce sites, and while still very much in its infancy, the potential is clearly there. Currently, flashy technology is of minimal importance compared to functionality. Customers, by and large, are beyond the point of being impressed with online bells and whistles. Current service applications tend to be nothing more than online versions of information that are already accessible via other means (e.g., catalogs, call centers, etc.). The key difference is that online information is universally available, is not time-dependent, is cost-free, and is available via customer control. As stated before, this allows service providers to reduce staff, eliminate toll-free numbers, and still provide what most users perceive to be improved service.

OTHER APPLICATIONS

The list of E-Commerce supporters and users goes on and on. Aetna Insurance uses their Web site to provide life insurance, financial, and health care data to current and prospective customers. Federal Express <http://www.fedex.com>, United Parcel Service <http://www.ups.com>, and the U.S. Postal Service <http://www.usps.gov> (yes, even the U.S. Mail!) now have Web sites that allow customers to track packages, inquire about shipping

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rates, and determine shipping times between two or more endpoints. Most airlines, including USAirways <http://www.usair.com> and United <http://www.ual.com>, now have sites that allow customers to make reservations, inquire about flight schedules, make ticket purchases, and research industry data. Some sites are linked to the FAA <http://www.faa.gov>, allowing the real-time status of any given flight to be determined.

There is, however, an interesting downside to E-Commerce in the airline trade. Recently, several airlines conducted a trial in which they eliminated the role of the travel agent and allowed the customers to come directly to their sites to carry out transactions. What they found astonished them: the airlines' costs increased fourfold! The customer service element that had traditionally been provided by the travel agents was gone, requiring the airlines to staff up to replace that vital component of day-to-day business. Needless to say, they brought the agents back into the fold rather quickly.

Would you use online banking services? Why or why not? If the answer is no, what would it take to get you to consider it?

The banking industry has been no slouch when it comes to the use of E-Commerce. Both Bank of America <http://www.bankamerica.com> and Wells-Fargo <http://www.wellsfargo.com> use the Internet to provide their customers with online banking services, credit card payment capabilities, credit card and loan applications, account transfer services, and loan rate information. These services have become so popular that the inevitable has happened: the first virtual banks have arisen. First Virtual Bank <http://www.fv.com> and Security First Network Bank <http://www.sfnb.com> are both Internet-based; neither of them have branches, buildings, or vaults. All transactions are online.

The list goes on. Cook's Garden <http://www.cooksgarden.com> sells seeds and gardening supplies online from their facility in Burlington, Vermont's Intervale. The Flying Noodle <http://www.flyingnoodle.com> offers customers membership in their Pasta Club and sells all sorts of sauces, pastas, and gifts through their site. Godiva Chocolatier <http://www.godiva.com> entices customers with mouth-watering photographs of their creations and very simple gift-ordering and shipping services.

Pepper Plant Hot Sauce <http://www.pepperplant.com> sells a bewildering assortment of hot sauces, ranging from mildly spicy to napalm. And Virtual Vineyards <http://www.virtualvin.com> offers online, virtual tastings with wine industry experts, publishes online wine reviews, dinner menus, and recipes, and sells a wide range of gifts.

It is interesting to note that all of these food-related sites are somewhat specialized in their product offerings, and probably did not

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enjoy much market share before the advent of the Internet. Now, both the "Death of Distance" phenomenon and the "David and Goliath" phenomenon work in their collective favor. It doesn't matter where they are, or how big or small their companies are. In a matter of minutes, their market presence can instantly become global.

Another successful, well-designed E-Commerce site is Amazon.com, which boasts an "inventory" of 2.5 million book titles. The site hosts critical reviews by professional critics, readers, and the authors of each work; author interviews; and a sophisticated, easy-to-use shopping basket concept. All orders to Amazon are placed online; they do not accept fax, phone, mail, or e-mail-based orders.

Both CDNow <http://www.cdnow.com> and CD Universe <http://www.cduniverse.com> allow customers to order CDs, music videos, and movies online; they are but two of a growing number of such sites in the music industry.

CRITICAL SUCCESS FACTORS

According to Dan Yurman's article, *Internet Markets* (ON THE INTERNET, January/February 1997), success in online mass markets is dependent on the presence of a "critical mass" of potential customers who exhibit three critical factors. First, they must be early adopters, that is, people who go after new technologies and products when they first come out. Second, they must be insensitive to price when it comes to what they actually spend online. In many cases, online purchases are recreational, rather than necessities. Finally, their purchases will often reflect lifestyle choices that may well border on the obsessive.

INTERNET COMMERCE MARKETS
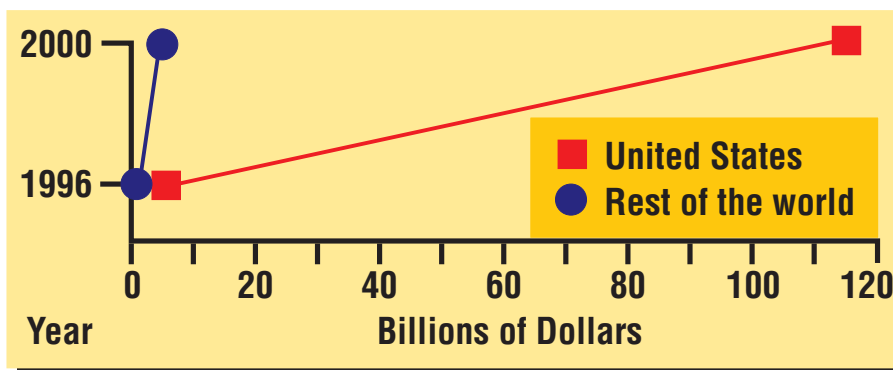
As the graph shows, North America generates the preponderance of E-Commerce revenues worldwide. By the turn of the century, other regions are expected to grow, but the bulk of the purchases is still expected to flow from North America, to the tune of several hundred billion dollars.
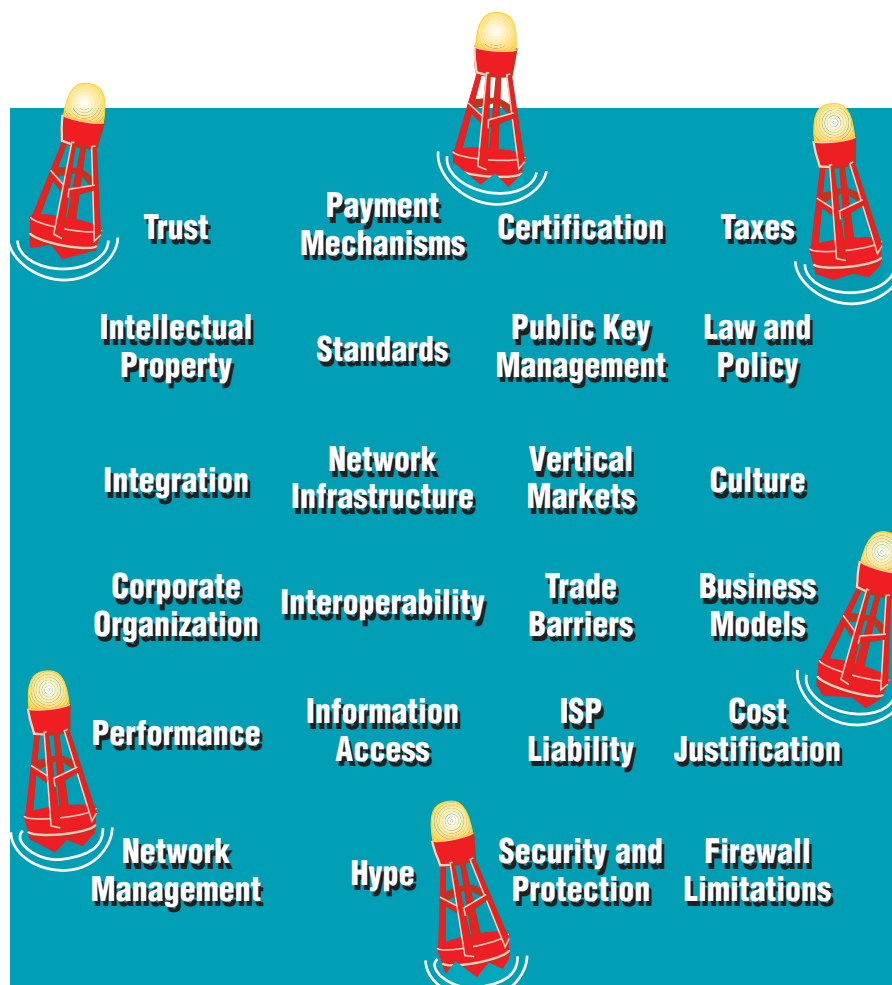
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Why is so much of the E-Commerce activity occurring in North America? Why the tremendous disparity between North America and the rest of the world?

Are these numbers and indicators real? Certainly, as indicators. There is no question that Internet-based commercial activities are real and growing in importance. They are in widespread use throughout the world, with the largest markets appearing in Europe, Japan, and North America. In 1995, online revenues amounted to less than $500 billion; by 2000, those revenues are expected to be somewhere between $10 and $500 billion. This indicates that no one is really sure of the magnitude, only that the numbers will grow. A bit of perspective, however: in 1996, U.S. businesses spent about $1 billion on Internet commerce. However, they spent $20 billion on promotional t-shirts, keychains, and notepads.

We still have a ways to go.

REMAINING BARRIERS TO E-COMMERCE

In spite of the appearance of a burgeoning electronic commerce marketplace, there are still significant challenges between E-Commerce today and widespread acceptance. According to CommerceNet, there are 24 major barriers that have yet to be overcome, as illustrated below.

Trust | Payment Mechanisms | Certification | Taxes
Intellectual Property | Standards | Public Key Management | Law and Policy
Integration | Network Infrastructure | Vertical Markets | Culture
Corporate Organization | Interoperability | Trade Barriers | Business Models
Performance | Information Access | ISP Liability | Cost Justification
Network Management | Hype | Security and Protection | Firewall Limitations

These concerns are all valid, although many of them fall into "house of cards" management, the idea that if certain key concerns are dealt with, quite a few others will go away as a consequence.

By and large, these concerns can be further categorized into three main areas: corporate, infrastructure, and security.

CORPORATE CONCERNS

Corporate concerns are a direct consequence of a company's structure and culture. Out of the three areas described above, corporate concerns are perhaps the most difficult to modify. They often play a key role in the definition of a company's market position, the nature of their principal customer base, and the corporate direction. As such, they are deeply rooted in the beliefs and behaviors that define a company. They include the factors detailed below.

Tactical vs. Strategic Positioning Electronic commerce is a powerful strategic tool. All too often, however, it is looked at as just one more payment option with little regard for the profound manner in which it can position a company closer to their customer base. Remember the work done by Harvard University's Michael Porter on product differentiation: chances are that your product is a commodity, which means that the customer has purchase options. The law of primacy works: whoever gets there first, wins. The closer you can position your product to the customer and the more innovatively you can do so, the better your chances of success. E-Commerce is much more than a tactical payment option: its impact is potentially long-term and powerful.

Corporate Culture and Business Models Again, corporate cultures and business models are highly intertwined. Each inevitably affects the other and the implementation of an E-Commerce option will affect them both. It changes the way companies behave and the way they interact with their customers. Consequently, the decision to make E-Commerce part of a company's corporate strategy should be part of a planned attack. It is not an end state; it is a *means* to an end. Companies that implement an electronic commerce Web site should do so after careful planning because its effects will be far-reaching. In many cases, the company's market penetration will change so drastically that a whole new business model will need to be defined; in some cases, corporate culture will change in cataclysmic fashion. Business as usual may go away, replaced by a whole new model of customer interaction.

Corporate organization also figures prominently in this scenario. The decision to support E-Commerce must be made prudently, as there can be significant hardware, software, and personnel costs associated with the decision. If the implementing organization is

"Be careful what you wish for: you might get it." Does this adage apply here? Where are the pitfalls?

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large enough to support an MIS staff, they *must* be involved in the project from day one; smaller organizations might need to add support staff, which again represents a significant change in the traditional "everybody does everything around here" paradigm.

Site Management Because the World Wide Web gives a company worldwide presence and exposure to a potentially global customer base, electronic commerce gives those global customers the ability to place orders and therefore to affect business, sometimes in dramatic ways. Managers must ask themselves if they are ready for the onslaught that could occur if such a scenario were to take place. Too much business is a wonderful problem to have, but it can be catastrophic if improperly managed.

Vertical Market Segmentation One factor that will allow E-Commerce to succeed is the continued proliferation of businesses on the Internet/WWW, which will in turn provide a motivating factor for its use. Unfortunately, while many companies have a presence on the Web, few are using it as a commerce medium. The use density will increase, but until that time, successes will consist of a sporadic series of fits and starts. Until large businesses start doing Web-based business successfully, the vertical industries that support them will have a sparse online presence, as well. Some industry pundits see this challenge falling under the spell of the "Field of Dreams" effect, believing that "if we build it [the vertical industries], they [big business] will come." Whatever the case, a certain amount of hurry up and wait mentality is inevitable.

What challenges does E-Commerce potentially pose for multinational corporations and their international customer base?

Transnational Business: Multinational corporations (MNCs) are rapidly becoming more the norm than the exception in business today. As corporations redefine their markets to serve the world, they inevitably face a new set of challenges that stem from doing business globally. These include export restrictions, public policy concerns, transfer pricing, international taxation, trade barriers, protectionism, and a variety of others. Companies that implement E-Commerce capability could be faced with a new set of challenges. In some cases there might be barriers to overcome; witness the ongoing controversy over encryption software, a critical component of E-Commerce, and whether it can be exported from the U.S. Under current law, it has historically been classified as "munitions" by the Department of Commerce <http://www.commerce.gov>, and has always been carefully controlled.

Taxation The ability to effortlessly and lucratively do business on the World Wide Web has caused federal and state tax authorities to prick up their ears with interest: they smell what they think is a new source of revenue. However, taxation of Internet commerce is to date a hands-off affair, much like the mail order catalog business in the

United States. At some point the issue will be resolved, but as yet it is an unanswered question. The problem is exacerbated by the global nature of E-Commerce; how can import duties be collected, for example, when the merchandise to be exported is a series of zeros and ones?

Intellectual Property Companies that are looking to do business on the Internet are skittish about the safety of their product in such a wild and uncontrolled place as the Internet. The degree of hysteria that exists over the perceived lack of appropriate security and safeguards on the Web is at an all time high; in fact, a significant barrier exists between consumers with money to spend and their willingness to do so on the Net.

Education plays an important role and the better customers are informed about the relative safety of electronic commerce, the more willing they will be to try it.

Payments Closely related to intellectual property protection issues are those that revolve around getting paid. Organizations like EDIBANX <http://www.edibanx.com>, CommerceNet, MasterCard/VISA, and others have taken pains to secure not only the buy-in of key and influential players, but to identify the primary issues around which most concerns hover. These include secure encryption and transmission standards, source and destination validation agreements, and nonrepudiation guarantees, to name a few. These companies have created a variety of payment techniques that are both secure and imminently auditable. E-Commerce is still in its adolescence; it will be some time before large-scale, stable commercial infrastructures are in place on an Internet-wide basis.

INFRASTRUCTURE CONCERNS

Infrastructure issues provide the underpinnings of corporate function. From the point of view of E-Commerce implementation, infrastructure includes everything from physical network topology to details such as ordering, tracking, billing, and payment, as well as those described below.

Standards There is no dearth of standards in telecommunications, and this is certainly true in the E-Commerce realm as EDI, SET, JEPI, and a host of other would-be global standards jockey to be "The E-Commerce Payment Standard." This standards problem is not restricted to E-Commerce, however, there are just as many battles going on in the Internet application realm. Market players are concerned and they have every right to be: commerce is serious business and in business, no one is willing to take a chance on anything short of a sure thing.

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Interoperability A great deal of work has been done to develop good electronic commerce components including ordering, billing, tracking, and payment software; computer and network components; secure transaction sets; search engines; network management systems; and a variety of "currency" models. Little has been done, however, to ensure interoperability between these disparate components. Many solutions remain proprietary, but as globalization continues and the need for interoperability grows, these vendor-specific solutions will disappear in favor of open standards.

Navigation Potential customers often feel lost in the wilderness as they navigate their way through the maze of the Net. The Internet is a dazzling array of information, ripe for the picking. But buried within its success lie the seeds of its own destruction, for so broad and diverse is the information it contains, that the ability to find a single, specific site successfully can be haphazard at best. The interaction that must be perfected between browsers, directory structures, agent software, and a plethora of information sources is still in its infancy, and will be for some time to come.

Performance Traffic congestion at the host (i.e., information source) and in the network is a particularly vexing problem for service providers and customers alike. Unlike the telephone, fax machine, or certain types of surface mail, there is as yet no guarantee of service on the Internet/World Wide Web.

Personnel In companies implementing E-Commerce, while qualified technical personnel are required to ensure that the physical infrastructure works properly, companies also need employees with commerce knowledge, customer service skills, business operations knowledge, security capabilities, and marketing know-how. In the same way that a physical sales environment needs all of these skills at one time or another, so too does the cyberstore.

SECURITY CONCERNS

Once a company has put into place the necessary infrastructure improvements and modifications to ensure its success, the security front line can be created. Security personnel must consider password protection, digital signature management, and deployment of smart cards (if merited), as well as logical and procedural considerations such as firewall permeability, the relative responsibilities and liabilities of partners, including network and Internet service providers (ISPs).

The bottom line of this entire discussion boils down to a few key points that fall under the heading of customer perception. Customers perceive that the Internet is insecure, that it is cumbersome to use, and that it is largely difficult to access. Furthermore,

Can you think of other concerns that are not mentioned here? Looking at the matrix of challenges discussed earlier, does any one of the 24 concerns listed seem more important than the others? Why or why not?

they don't understand how they actually pay for things in this new electronic medium.

INDUSTRY RESPONSES

To this set of relatively negative perceptions on the part of the user community, industry has responded in a variety of ways. First, they have loudly and publicly announced the creation of an expanded set of secure protocols and commercial applications designed to assuage concerns over the lack of security on the Internet.

Second, applications designers have continuously improved their browsers to make them easier to use and more intuitive, thus reducing the argument about the difficulty involved in using them.

Third, they have worked hard to standardize network interfaces and gateway services through pilot projects designed to showcase value, safety, and convenience of the Net. Working groups have been seated in CommerceNet, the Internet Engineering Task Force (IETF), and the World Wide Web Consortium (W3C) <http://www.w3.org>.

And the status today? Network connectivity is good and getting better; access and usage costs are low; interactivity is very good; EDI and electronic payment mechanisms are either in place or well-advanced; authentication, privacy, and nonrepudiation capabilities are well underway; and service guarantees, while still somewhat nonexistent, are getting better.

What, exactly, were investors buying when they bought shares of stock in Yahoo Corporation? What is the company's product?

SHOW ME THE MONEY!

So: In the face of all this, there is a myth claiming that no one is making money with E-Commerce and that many companies are scaling back their Internet business plans. It certainly is true that success is not guaranteed by throwing money at a Web site to create glitz, and it is also true that Web-based business ventures do not align well with traditional venture capital models designed to exact a quick return through a public offering. Consider the recent spate of Internet IPOs (initial public offering), including Netscape and Yahoo <http://www.yahoo.com>.

The most successful companies treat their Web ventures like an emergent startup and don't expect immediate returns. A recent Ernst & Young <http://www.ey.com> study suggests that more companies are investing more money into their Web sites, but aren't expecting measurable profits until the 1998 timeframe. However, most expect revenues to increase sixfold by 2000. A similar study conducted jointly by CommerceNet and Nielsen Media suggests that the numbers of people willing to shop online will increase substantially over the next few years, as comfort levels increase.

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ELECTRONIC PAYMENTS

In the "real world," there are four basic payment mechanisms: cash, checks, credit cards, and now debit cards. In the electronic realm, however, there are considerably more, all of which use different standards, different protocols, and radically different payment models.

Most of the payment models today are designed to emulate transactions that involve money, banking, credit card transactions, and third-party cash transfers—techniques that most potential customers are comfortable with. The models include CyberCash <http://www.cybercash.com>, DigiCash <http://www.digicash.com>, First Virtual Holdings <http://www.fv.com>, the Joint Electronic Payments Initiative (JEPI) <http://lists.w3.org/Archives/Public>, LivePayment (Netscape), NetCheque <http://nii-server.isi.edu/info/NetCheque>, and Secure Electronic Transactions (SET) (http://www.mastercard.com/set/set.html>.

Additionally, there is a considerable amount of activity underway to enable micro-transactions, which allow users to make purchases for as little as 10¢. These initiatives include ClickShare <http://www.click-share.com>, Millicent <http://www.research.digital.com/SRC/millicent/papers/millicent-w3c4/millicent.html>, and NetBill <http://www.netbill.com>.

FAKE ELECTRONIC MONEY

"Bits is bits," observes Dave Hill, the founder and Chairman of Hill Associates. "The bits that make up a digitized voice call, or a medical image, or an MPEG movie, or a spreadsheet, all look and feel and taste and smell exactly the same to the network switches and transmission equipment." With this observation, Hill points out one of the areas of greatest concern in the emerging arena of electronic payment mechanisms. As James Gleick, noted chaos theorist and distinguished biographer of physicist Richard Feynman, notes in a NEW YORK TIMES interview (June 16, 1996),

> [A]s money enters a new age, so does counterfeiting. The ultimate threat is the perfect copy—the virtual coin that proves mathematically identical to the real thing. If money is a string of bits, then someone, somewhere, can make a perfect copy, and another and another. An arms race is already raging between those working to armorplate digital cash with doubly and triply secure cryptography and those working to pierce the armor. Security experts assume that nefarious characters, in search of an unending stream of money, are already investing millions in the next stages of research and development.

Printing counterfeit paper currency poses a significant challenge to the counterfeiter. The correct paper must be used, the engraved printing plates must be perfect, and distribution is highly risky. Electronic counterfeiting, on the other hand, while difficult, may be far more of a threat. After all, bits is bits.

SECURITY: CRYPTOGRAPHIC SCHEMES

To protect against such things as digital counterfeiting, security specialists have designed a wide variety of cryptographic schemes that serve to disguise or mask the actual content of a secure message, thus preventing the message from being copied or read. Three primary techniques have emerged in this field: hash functions, secret key methods, and public key techniques.

With hash functions, a mathematical permutation of the original message is created to form a "fingerprint" (i.e., the hash value) of the message; any change to the message will change the calculated hash value, thus making it possible to detect a message that has been tampered with in some way. This technique is sometimes called one-way encryption. Examples of hash function encryption include Message Digests 2, 4, and 5 (MD2, MD4, and MD5), and the Secure Hash Algorithm (SHA). Hash functions are primarily used to ensure message integrity (i.e., to prove that the message has not been altered in any way between transmission and receipt).

How might you overcome the negative customer perception that exists surrounding network and computer security, to convince more customers to use E-Commerce?

Secret key cryptography, sometimes called symmetrical cryptography, is used to ensure message privacy. In secret key systems, messages are encrypted using well-known algorithms, but using a key known only to the sender and intended receiver. Without the key, the message cannot be decrypted and is therefore safe from prying eyes. In general, longer keys yield more secure transmissions. Examples of secret key algorithms include the Data Encryption Standard (DES), International Data Encryption Algorithm (IDEA), Triple-DES, and Ron's Ciphers 4 and 5 (RC4 and RC5).

Public key cryptography systems, sometimes known as asymmetrical systems, require two keys to send an encrypted message and decrypt it on the receiving end. The nature of the algorithm is such that either key can be applied first; furthermore, knowledge of one key cannot be derived by knowing the other key. For this reason, one key can be widely publicized (i.e., the *public* key) and the other kept a secret (i.e., the *private* key). When a user sends a message, he or she encrypts using the receiver's public key, which allows the receiver to decrypt the message. Examples of public key cryptography are Rivest-Shamir-Adelman (RSA) <http://www.rsa.com>, the Digital Signature Algorithm (DSA), and Diffie-Hellman encryption. This technique is most often used for message authentication, secret key exchange, and

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nonrepudiation. Nonrepudiation is the technique used to ensure that neither the sender nor receiver of a message can later claim that the message was neither sent nor received, respectively.

TOWARD A STANDARD: THE JOINT ELECTRONIC PAYMENTS INITIATIVE (JEPI)

As electronic money weaves its way into the economic mainstream, the need for payment standard on the Internet to support E-Commerce has arisen with a plaintive cry for widespread support. In response, CommerceNet and the World Wide Web Consortium (W3C) formed a team of core members dedicated to the creation of a standard Internet payment mechanism. In addition to CommerceNet and W3C, the team members include British Telecom <http://www.bt.com.uk>, CyberCash, Digital Equipment Corporation <http://www.digital.com>, IBM <http://www.ibm.com>, Microsoft, Open Market, VeriFone <http://www.verifone.com>, and Xerox <http://www.xerox.com>. Their primary goal has been to define a mechanism that will allow customers to use a wide variety of payment mechanisms to conduct business on the Web, in the same way that traditional businesses today allow customers to use a wide variety of payment options.

The Joint Electronic Payments Initiative (JEPI) came about to fulfill a need that was not addressed by traditional payment mechanisms. In the past, it was a common problem that merchants often had to have a separate card swipe system for each credit card they were willing to accept in payment. The result of this was that many merchants refused to accept certain cards, thus restricting customer access to their wares.

VeriFone, an active member of the JEPI design team, solved this initial problem by designing a swipe unit that would accept any card, dial the appropriate verification number encoded on each card's magnetic strip, and select the appropriate approval protocol.

The second piece of the solution arrived in the form of the JEPI protocol stack, illustrated here. In this set of protocols, the payment protocol is a specific and unique part of the client and server appli-

| Payment Protocol(s) |
| Universal Payment Preamble (UPP) |
| Protocol Extension Protocol (PEP) +HTTP |
| TCP |

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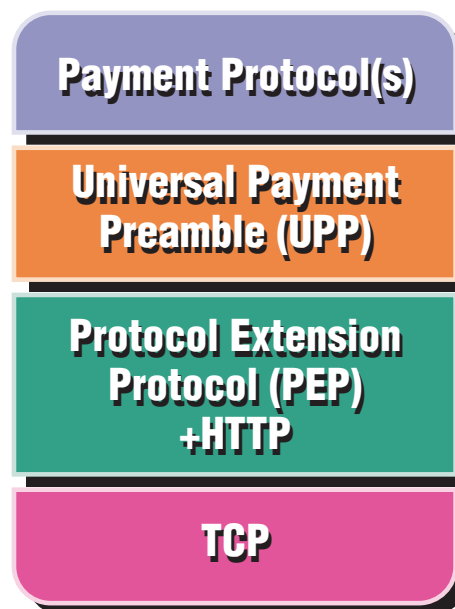
cation. The Universal Payment Preamble (UPP) is used to negotiate the payment protocol that will be used, based on the vagaries of each individual transaction. The negotiation itself is conducted in clear-text; any necessary security is provided by the payment protocol being used.

The Protocol Extension Protocol (PEP) is an extension of the Hypertext Transfer Protocol (HTTP). UPP messages are wrapped in PEP/HTTP, then carried over the network using the Transmission Control Protocol (TCP) as the reliable Transport Layer protocol. Of course, the TCP segment is transmitted through the network as an IP packet.

THE SECURE ELECTRONIC TRANSACTION (SET) INITIATIVE

In the face of scrutiny from all directions over security issues, the Internet commerce community has responded with several initiatives designed to reduce concerns about the relative security of cyberspace. One of these efforts is embodied in digital certificates.

Digital certificates are a form of electronic identification that rely on public key cryptography and a reliable certificate management system to improve security for E-Commerce transactions. Certificate management systems are used to manage digital certificates, which are affixed to messages to impart a unique "signature" that identifies the sending party, ensures the message has not been changed or intercepted en route, and verifies the message was both sent and received properly (nonrepudiation).

To increase public trust in E-Commerce, MasterCard <http://www.mastercard.com> and Visa <http://www.visa.com>, together with GTE <http://www.gte.com>, IBM, Netscape, Microsoft, and a number of other companies, created the Secure Electronic Transaction (SET) standard, which embodies digital certificates as part of its architecture. SET gives cardholders, merchants, and financial institutions a reliable way to protect credit card numbers from theft or duplication during a transaction by matching card numbers to the identity of the sender, ensuring that orders have not been modified in any way during the transmission, and providing a receipt at the time the transaction is completed.

SET is actually the result of two different standardization efforts, namely the Secure Electronic Payment Protocol (SEPP) and the Secure Transaction Technology (STT). SEPP was designed to support secure bank card transactions and was jointly developed by a significant cadre of the original SET team: Netscape, MasterCard, CyberCash, IBM, and GTE. STT was developed jointly by Microsoft and Visa , and was targeted at generic secure transactions. SEPP and STT, as well as the development teams, were combined to form SET.

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SET Protocol 1.0 was released in May 1997. The protocol specification is available freely on the Internet, in three books. In addition to describing message formats and protocol handshaking, DES and RC4 appear to be the main choices for message encryption, while RSA is used for key exchange, digital signatures, and public key-based credit card encryption.

Today, credit cards are the principal payment mechanism for Internet purchases. Consequently, SET-based digital certificates will provide security and accountability for some time to come. And while both JEPI and SET are just now putting their feet into the E-Commerce mainstream, there are others.

CYBERCASH

One of the discussion items that emerged early on in E-Commerce implementation meetings was the concept of trusted third parties (TTPs). This refers to the creation of organizations that would serve as anonymous, impartial "transaction management servers" between buyers, sellers, and financial institutions. One of the first of these to emerge is CyberCash. Originally conceived as a credit card authorization system for Internet transactions, its purview has now been expanded to include debit cards, electronic checking, and electronic cash.

CyberCash comprises three components: a CyberCash Wallet, the Secure Merchant Payment System (SMPS), and the CyberCash Gateway Server. The functions and responsibilities of the three are actually rather straightforward. In a CyberCash payment scheme, a buyer, who must be in possession of a CyberCash Wallet, sends encrypted credit card information to the seller. The seller forwards encrypted bank information along with the buyer's credit card information to the CyberCash server; the seller never even sees the buyer's information in unencrypted plaintext (unlike today where
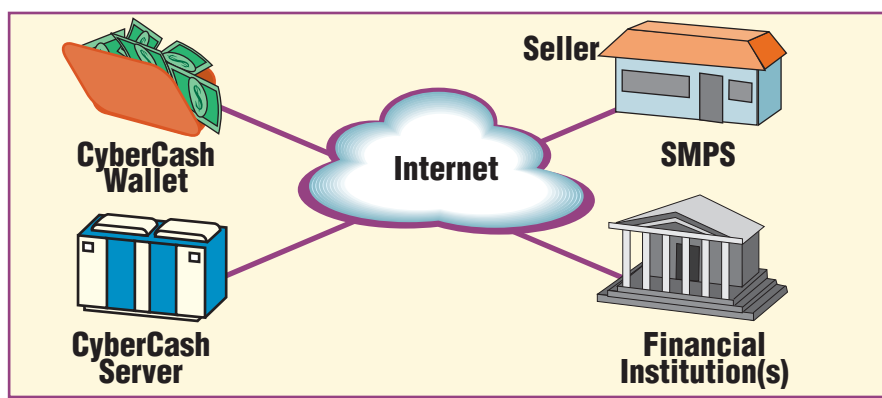
the seller actually handles the buyer's credit card). The CyberCash server sends the information to the seller's bank, which in turn forwards the request to the agency that issued the buyer's credit card. The card agency forwards an approval or denial to CyberCash, which in turn forwards the card status back to the seller. From there, the application that is in use between the buyer and the seller takes over and routine procedures complete the transaction.

ECASH BY DIGICASH
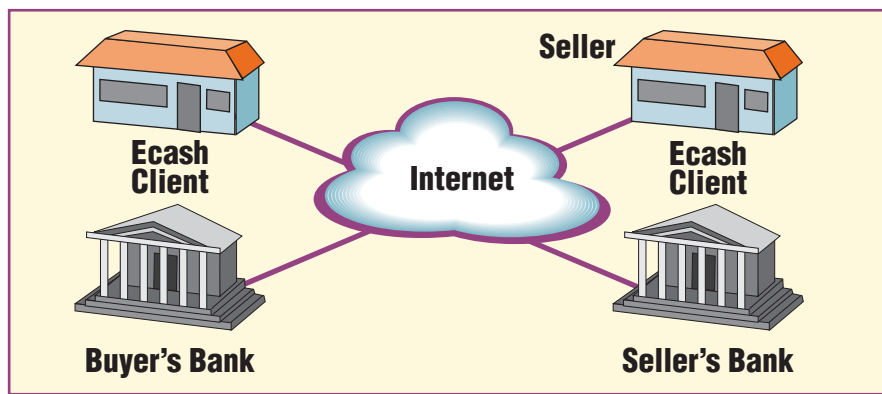
DigiCash's Ecash relies on a different model. Ecash is, in effect, "digital money." Ecash clients have accounts at Ecash banks, from which they can withdraw digital money they then store on a local PC. The money can be spent with any Ecash merchant—the merchant simply deposits the Ecash with their own Ecash bank, thus completing the transaction.

As is the case with real currency, the spender is anonymous in Ecash transactions, since no credit card or digital "check" is ever used. The digital money serves to prevent fraud by being identifiable, but does not in any way identify the spender.

In an Ecash transaction, the buyer requests digital money from their bank. The bank records the serial numbers of the Ecash, sends the money to the client, and debits the client's account. The buyer then uses the digital cash to purchase goods; the seller accepts the digital cash and sends the serial numbers to their own bank for verification. If the serial numbers pass muster, the seller's bank returns an authorization to the seller and credits the money to the seller's account. The seller then notifies the buyer that the transaction was successful.

THE FIRST VIRTUAL INTERNET PAYMENT SYSTEM

First Virtual is a cooperative arrangement between Electronic Data Systems (EDS) <http://www.eds.com> and First USA Merchant Services designed to allow credit card transactions to be carried out

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securely through simple e-mail transactions. Both companies play an active role in the process; EDS processes credit card information, while First USA Merchant Services maintains the database of merchant information.

In this system, buyers and sellers use a VirtualPIN to identify each other. Credit card information is never sent across the Internet. In practice, a user applies to First Virtual for a Buyer VirtualPIN via the World Wide Web, providing their name, address, e-mail address, and a requested PIN number. The system responds through e-mail with an application code and an 800 number. The user calls the number and enters their Visa or MasterCard number via the touchtone pad; an account verification is returned via e-mail. This process is quick, easy, and the PIN costs $2 per year.
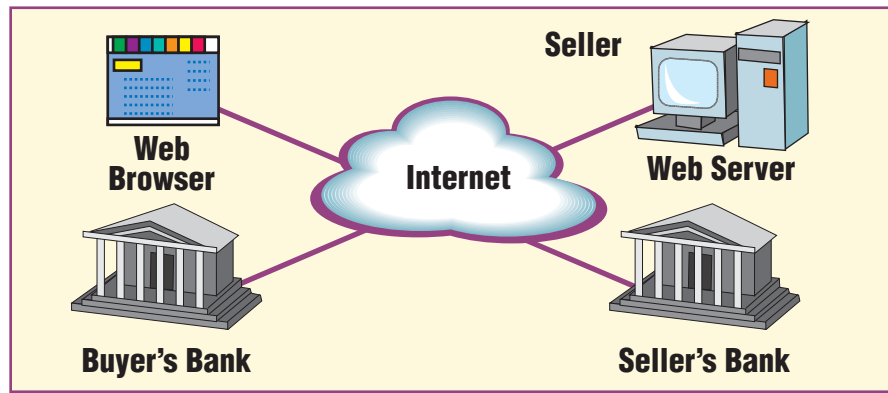
Of the three techniques described in the last few sections, which do you feel is the most secure? Why?

To use the First Virtual Payment scheme, the buyer determines the items they want to purchase, and then sends their VirtualPIN to the seller via the Web; in return, the buyer receives a "transaction-request confirmation" notice from the seller. The seller then forwards the transaction request to First Virtual, which sends e-mail to the buyer confirming the purchase details and requesting a confirming response. The buyer responds to the request via e-mail with one of three responses: yes, no, or fraud. If the response is yes, First Virtual debits the buyer's credit card and a confirmation is forwarded to the seller. If no, the transaction is canceled and the seller is so notified. If fraud is returned, the transaction is canceled, the seller is notified, and the buyer's VirtualPIN is canceled, thus preventing further use.

ELECTRONIC DATA INTERCHANGE (EDI)

Electronic data interchange (EDI) has been around and in widespread use for quite some time. Typically, it is considered to be a mechanism for the transfer of business documents between applications and most commonly between computers, usually via a network connection or a mechanical tape transfer.

Businesses often employ EDI to send purchase orders, invoices, and shipping notices because it is fast, inexpensive, and safe. With EDI, it is not necessary to have identical document creation environments on both ends of a transaction. EDI translation software converts proprietary formats into an agreed upon standard format that can be read and interpreted by either system.

EDI, then, is a collection of standards and software, and a communications infrastructure for the exchange of business documents. The standards are defined by Data Interchange Standards Association (DISA), the secretariat for the American National Standards Institute (ANSI) X12 EDI specifications and the International Organization for Standardization (ISO) in their UN EDIFACT specifications.

The roles of each component in the EDI architecture are clearly delineated. The software translates between the specific format of each user application and the appropriate EDI specification, and is responsible for message formatting and management. The communications infrastructure is responsible for both batch processing and transmission (usually via some form of electronic mail). In more than 75% of the cases today, EDI messages are transmitted via a privately owned value-added network (VAN) or over a leased line network. Future implementations will use the Internet and a wide variety of public e-mail systems.

Because of the marked improvement that it

EDI Document Options

810	Invoice
820	Remittance Advice (buyer to seller) Payment Order (seller to buyer)
822	Customer Account Analysis (bank to seller)
840	Request for Quotation
843	Response for RFQ
850	Purchase Order
855	P.O. Acknowledgment
860	P.O. Change Request (buyer to seller)
865	P.O. Change Acknowledgment/ Request (seller to buyer)

makes on routine business processes, many companies have mandated EDI for business-to-business communications. Staples Corporation <http://www.staples.com> has gone so far as to post their EDI Implementation Guide online for potential business partners. The automotive industry went even further: given the number of vendors that they must deal with, they issued an all-points mandate to all vendors, putting them on notice that they intended to convert to an all-electronic, fully EDI-compliant industry. They gave their vendor-partners plenty of time to effect the conversion, but made it eminently clear that the conversion was not an option.

The messages and forms used in EDI-based systems vary somewhat with regard to name and format among industries, but the content is often similar. Consequently, implementation conventions such as those shown have been implemented.

EDI is a powerful mechanism for accelerated and accurate electronic invoicing and payment. Georgia Pacific convinced its suppliers to become EDI-compliant by informing them that while conversion to an EDI platform wasn't mandatory, it was in their best interest because EDI users would be paid faster. That proved to be incentive enough for most.

EDI AND THE INTERNET

Today, the Internet is being discussed in earnest as the next transport mechanism for secure EDI activities. There are a number of good reasons for this: there is no value-added network to pay for or maintain, nor support or archival storage fees to pay; it is a responsive, reliable, and flexible transport mechanism; it provides a single worldwide network infrastructure for EDI, as well as any number of other applications, including e-mail; and, it provides instant and automatic connectivity to countless other corporations.

In response to this interest, CommerceNet commissioned an Internet-based EDI pilot, and garnered the participation of a number of major players, including Actra <http://www.actra.com>, AT&T <http://www.att.com>, the Department of Defense <http://www.dod.gov>, Digital Equipment Corporation, EDS, Harbinger <http://www.harbinger.com>, Lotus <http://www.lotus.com>, Premenos <http://www.premenos.com>, and Sterling <http://www.sterling.com>. The pilot, conducted between the second half of 1996 and the first quarter of 1997, was divided into three phases. In Phase One, participants perfected the exchange of MIME-encoded EDI messages. In Phase Two, they added Secure MIME (S/MIME) encryption and integrity, plus digital signatures. In Phase Three, they added receipt request capability. The trial was considered a resounding success by all participants and is now being studied for further implementation.

TWO APPROACHES TO EDI OVER THE WEB

Two companies, both participants in the CommerceNet trial of Internet-based EDI, have emerged with commercial solutions to the challenge of secure EDI transactions over the World Wide Web. Harbinger Corporation uses the Web as the interface to an EDI value-added network, thus providing a simple, well-known interface combined with the security and support services inherent in a VAN.

Premenos uses Secure HTTP (S-HTTP) in combination with the Secure Sockets Layer (SSL) for EDI on the Web, thus eliminating the need for the value-added network.

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Outstanding Issues and Final Thoughts

As with any new business venture, E-Commerce is laced with unresolved issues. Among others, these include: national, regional, and global regulation; financial concerns; legal issues; market access issues; advertising; and the status of enabling legislation.

REGULATION AND E-COMMERCE

The emerging Global Information Infrastructure (GII) is an agreement that has been forged between the governments of many countries. It attempts to describe the desired end state of the world's telecommunications infrastructure, considering how critical it is for worldwide commerce <http://www.iitf.nist.gov/eleccomm/ecomm.html>. The GII will revolutionize the way in which businesses conduct international trade. The National Institute of Standards and Technology (NIST) <http://www.nist.gov> proposed a set of global E-Commerce principles that have now been adopted in slightly different (but functionally identical) forms by the European Ministers, ISO, and the ITU, to name a few. These principles maintain that:

- In all activities dealing with E-Commerce, the private sector should lead the way.

- Governments should avoid undue restrictions, such as overly burdensome taxation, on E-Commerce.

- Government involvement in E-Commerce should be supportive and minimal.

- Governments must recognize the unique nature of the Internet and the potential it has to offer to global commerce if allowed to flourish.

- E-Commerce should be facilitated internationally.

FINANCIAL ISSUES

The primary financial issues that face E-Commerce are customs and

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tax-related. It is widely believed that the United States will advocate that the Internet be declared a "duty-free" environment, and that new taxes imposed on online purchases be prohibited. Other countries seem to be following the same model. This position is also supported by the Internet Society and by CommerceNet.

The other concern being discussed is electronic payment systems. As was discussed in Part II, serious attention is being directed at the development of globally acceptable payment mechanisms, and this effort is underway worldwide. This concern, while real, should not pose a significant challenge much longer.

LEGAL ISSUES

Take a few minutes to research the status of digital watermarking on the Web. What is it? Is it a good technique?

Does E-Commerce require a unique Uniform Commercial Code similar to the one used in traditional commerce today that validates, recognizes, enforces, and facilitates monetary purchases and transactions? Or will the existing system suffice with a few modifications to address the special considerations of Internet-based commerce? No answer exists yet for this question, but it is under consideration, with additional attention being paid to the issues of global commerce. Furthermore, what steps are being taken to ensure the protection of intellectual property on the worldwide Internet? Currently, copyrights and patents are covered by international treaty, but they are difficult to enforce when the intellectual property in question consists of an easily reproduced bit stream. Furthermore, trademarks pose their own set of challenges. Because they are specific to each country, they are virtually impossible to enforce.

Privacy is perhaps the single greatest concern for the average user, and perhaps the concern that poses the greatest roadblock to widespread deployment and acceptance of E-Commerce. Most industry analysts believe that procedures need to be put into place that force online information gatherers to inform online consumers what they are gathering, how they intend to use the information, and to whom it will be sold. On a related note, consumers must have the right to limit the use and reuse of personal information collected about them on the network.

Related to privacy is security. For electronic commerce, security is not an option; in fact, most consumers believe that security must be in place before they will even consider an online transaction. There is a downside to security that poses an interesting conundrum for lawmakers. While powerful security techniques protect consumers and businesses, they also provide a shield behind which criminals and potential terrorists can hide. It is no accident that the United States classifies cryptographic software as "munitions" and its export must be subject to tight governmental control, as evidenced

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by the controversy underway in Washington over whether encryption software should be made available for export. The current trend seems to be that key recovery-based cryptographic products with unlimited length keys or algorithms will be allowed to be exported on a severely limited basis. It is also anticipated that oversight for crypto export will move from the State Department to the Commerce Department, another signal of cryptography's importance to modern international commerce.

MARKET ACCESS ISSUES

Market access issues include more than network infrastructure and interoperability concerns. They also concern themselves with foreign content quotas, advertising regulation, content regulation, fraud prevention regulation, and cultural differences that address such things as the definition of seditious, pornographic, or otherwise unacceptable material. Many of these concerns stem from the inevitable international and multicultural nature of the Internet and therefore of E-Commerce. The concerns will have to be resolved, but will no doubt require significant cultural sensitivity and international flexibility to bring about.

INTERNET ADVERTISING

Advertising is a necessary part of doing business. It is required in one form or another to make the buying public aware of a company's products, philosophies, and corporate direction.

On the Internet, however, advertisers have been reviled, largely because the Internet has historically been a place that is blissfully free of advertising. The early Internet did not allow commercial users, so the culture has never supported commercial messages. Thus, we see today an ongoing, vituperative battle over whether advertising should be allowed, and if so, in what form. Consider the hortatory rhetoric being tossed around over the practice of spamming—the unsolicited mailing of large volumes of e-mail advertisements.

Whatever direction the Internet community goes, there are some interesting observations that must be made with regard to online advertising. First of all, we must recognize that the traditional constraints of print space, air time and geography disappear with Internet advertising. The demographic breadth, that is, the reachable audience, is incalculable. Furthermore, the nature of the medium allows advertisers to create advertisements that are interactive and engage the "viewer" in some way to improve the sticking power of the information contained in the ad. One question that has not yet been addressed, however, is effectiveness measurement. How does

an advertiser know whether or not their ad is hitting the right audience or having the intended effect? In traditional advertising, audiences are measured in terms of cost per thousands of viewers (abbreviated CPM). Because of the outback, frontier nature of the Internet, however, it is difficult to quantify the reachable audience in those terms (although some sites that carry advertisements will log an event if a user goes to an advertised site from their pages and charge a nominal fee per "referral").

Carol Moore, IBM's home page editor, observed recently that "The real estate a Web [advertisement] builder has to work with is eight inches deep and two seconds long," referring to the height of the typical laptop computer and the attention span of the average Web surfer. This is not television, where viewers are willing to sit passively on the couch and let the message of the medium wash over them like a rising tide. This is the Internet, where "viewers" are much more aggressive, much more demanding, and much more interactive than their TV couch potato counterparts. Consequently, if an advertiser is to get their message out there, they have to do it on the terms of the audience they want to affect.

Why is it that some online advertisements are offensive while others are not?

INTERNET ADVERTISING HISTORY

When Internet advertising first started, one trend that emerged was to charge surfers for site access using subscriptions, similar to what magazines do today This was proposed as a way to offset the cost of maintaining a "pure" Web site and predated a secondary trend, which was to accept online advertising at sites to offset the cost of having the site online. Both of these trends were met initially with loud and ferocious resistance, but the resistance waned when net surfers realized that in exchange for having to look at the occasional ad, they received free access to a much wider variety of information than ever before. Today's model is based on the notion that it's okay to advertise in exchange for free information access.

INTERNET ADVERTISING TECHNIQUES

There are two principal methods in use today for Internet advertising. The first of these is the publisher Web site where a banner or a log is placed in a prominent position at a highly frequented site for a fee. Examples of this technique include Pathfinder <http://www.pathfinder.com>, Yahoo, and other search engine and Web directory sites. Online ad sales were $300 million in 1996, and are expected to top $5 billion by 2000. Pathfinder charges $10,000 per month for an ad at their site; Yahoo's rates are similar. These sites offset the cost of maintenance through these advertising revenues.

The other major method is an advertiser Web site. Advertiser Web sites are owned and operated by the company whose products and services they advertise, and are often operated at a loss. Examples of this type of site include AT&T and SEGA Corporation <http://www.sega.com>.

INTERNET AD FORMATS

Six major formats have emerged unscathed from the Internet advertising battlefield. All have been deemed effective, and all are used, many in combinations by the same companies. These formats include:

■ Placement of a corporate logo at an affiliate site, where the logo is a hyperlink back to the site it advertises.

■ Sponsorship of another site. SEGA corporation has its corporate site, but it also sponsors SEGAWorld. <http://www.segaworld.com.au>, an Australian site that allows visitors to play games and learn about the latest and greatest products coming out of the corporation. This site is clearly targeted at a younger audience than the corporate site.

■ Placement of a banner ad on a publisher site's home page or content page.

■ Placement of a logo on an advertiser site.

■ Listing the site in an online directory.

■ Participating in a "cybermall" by paying to have a "storefront" in the "mall."

THE FUTURE OF INTERNET ADVERTISING

With the increased acceptance of Internet advertising, a number of additional changes will take place in the world of online advertising. First, expect to see an expanded use of dynamic banners as Java and Java-like software packages enter the mainstream. Second, look for customized content and Web sites with more of a high-tech feel about them. Netscape has pioneered such a Web site where people accessing the site can actually customize much of what they see displayed.

In the advertising world, more accurate measurement methods will emerge as the "cost per thousands of viewers" metric (CPM) loses its effectiveness in the face of a largely undefinable audience. Finally, whatever method emerges will be adopted quickly by the entire advertising industry. This medium and the audience it serves have been recognized as important and large. They have money, they are not particularly sensitive to reasonable price fluctuations, and have made the

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online world a part of their lives. They must therefore be addressed by the advertisers, but addressed properly. The Internet community is a fickle, unforgiving group of people: advertisers should pay close attention to what they are looking for and give it to them on their terms. On the other hand, this group of users also has a short enough collective memory that errors made by a company one day are soon forgotten; if a site is "cool enough," people will flock to it almost irrespective of that site's history.

ENABLING LEGISLATION

The success of online commerce and the growing presence of the Internet has caused state and federal governments to sit up and take notice. At present, digital signature legislation is appearing in many states that defines security processes for electronic commerce and provides a framework for the establishment of certification authorities. States that have pending or existing legislation include: California, Florida, Georgia, Illinois, Massachusetts, Oregon, Utah, Vermont, and Washington.

COMMERCENET REVISITED

If we go back and revisit the list of E-Commerce concerns that CommerceNet has posed to the online industry, we must once again ask: How should these concerns be addressed? What order should they be addressed in? Are they all valid concerns?

Trust	Payment Mechanisms	Certification	Taxes
Intellectual Property	Standards	Public Key Management	Law and Policy
Integration	Network Infrastructure	Vertical Markets	Culture
Corporate Organization	Interoperability	Trade Barriers	Business Models
Performance	Information Access	ISP Liability	Cost Justification
Network Management	Hype	Security and Protection	Firewall Limitations

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IN CONCLUSION

Electronic commerce, which started life as a vanity concept, has burgeoned into a multimillion dollar juggernaut that shows no signs of slowing down. Once ignored by most industries, it has caused them all to sit up and take notice because the revenues that are pouring out of the Internet and the commerce it supports are not trivial. E-Commerce is literally changing the way in which we think of doing business, but at the same time, causing a re-examination of how customers and businesses interrelate.

Not only has E-Commerce caught the eye of most corporations, it is also guiding the efforts of advertising agencies, spawning a whole new generation of commercial applications, payment mechanisms, and security procedures, and involving governments worldwide in a totally unprecedented fashion.

There are certainly outstanding issues to be resolved, but this is not unique to E-Commerce. However, they will be resolved in short order because dollars—significant numbers of them—are at stake.

Appendix

A LIST OF ACRONYMS AND ABBREVIATIONS

ANSI	American National Standards Institute
ATM	Automatic teller machine
CA	Certification authority
CD	Compact disc
CPS	Certification practice statement
DES	Data Encryption Standard
DOB	Date of birth
DSA	Digital signature algorithm
EDI	Electronic Data Interchange
EDIFACT	Electronic Data Interchange for Administration, Commerce, and Trade
HTML	Hypertext Markup Language
HTTP	Hypertext Transfer Protocol
IDEA	International Data Encryption Algorithm
IETF	Internet Engineering Task Force
ILEC	Incumbent Local Exchange Carrier
IP	Internet Protocol
IPO	Initial public offering
ISO	International Organization for Standardization
ISP	Internet service provider
ITU-T	International Telecommunication Union – Telecommunication Standardization Sector
JEPI	Joint Electronic Payments Initiative
JIT	Just in time
LEC	Local Exchange Carrier
MD2, MD4, MD5	Message Digest algorithms 2, 4, and 5
MIME	Multipurpose Internet Mail Extensions
NIST	National Institute for Standards and Technology
NNTP	Network News Transfer Protocol
PEM	Privacy enhanced mail
PKCS7	Public Key Cryptography Standard #7

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PKI	Public key infrastructure
PIN	Personal identification number
RC2, RC4, RC5	Ron's Ciphers 2, 4, and 5
RSA	Rivest, Shamir, Adelman
S-HTTP	Secure Hypertext Transfer Protocol
S/MIME	Secure Multipurpose Internet Mail Extensions
SET	Secure electronic transaction
SHA	Secure hash algorithm
SSL	Secure Sockets Layer
TCP	Transmission Control Protocol
VPI	Virtual private internet
UN	United Nations
VAN	Valued-added network
W3C	World Wide Web Consortium
WWW	World Wide Web

URLs OF INTEREST

Note: All of these URLs are available through the Hill Associates Web site at:

http://www.hill.com/library/ecommurl.html

Aetna Insurance	http://www.aetna.com
Amazon.com Books	http://www.amazon.com
Bank America	http://www.bankamerica.com
Buy IT Online	http://www.buyitonline.com
The Catalog Site	http://www.catalogsite.com
CDNow	http://www.cdnow.com
CD Universe	http://www.cduniverse.com
Clickshare	http://www.clickshare.com
CommerceNet	http://www.commerce.net
CompUSA	http://www.compusa.com
Cook's Garden	http://www.cooksgarden.com
CyberCash	http://www.cybercash.com
Dell Computer	http://www.dell.com
DES information	http://www.quadralay.com/Crypto/source-books.html
DigiCash	http://www.digicash.com
Digital Equipment	http://www.digital.com
Digital signature info	http://www.softwareindustry.org/issues/1digsig.html
Egghead Software	http://www.egghead.com
Electronic Payments Forum	http://www.epf.net/epfhome
Federal Express	http://www.fedex.com
First Virtual Bank	http://www.fv.com
Flying Noodle	http://www.flyingnoodle.com
Godiva Chocolatier	http://www.godiva.com

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Hill Associates   http://www.hill.com
Internet Society   http://www.isoc.org
ITU-T   http://www.itu.int
JEPI information   http://lists.w3.org/Archives/Public
L.L. Bean   http://www.llbean.com
MasterCard   http://www.mastercard.com
Microsoft   http://www.microsoft.com
Millicent
   http://www.research.digital.com/SRC/millicent/papers/millicent-w3c4/millicent.html
MSNBC   http://www.msnbc.com
National Public Radio   http://www.npr.org
NetBill   http://www.netbill.com
NetCheque   http://nii-server.isi.edu/info/NetCheque
Netscape   http://www.netscape.com
NandO Times   http://www.nando.net
NIST "Framework for Global Electronic Commerce"
   http://www.iitf.nist.gov/eleccomm/glo_comm.htm
Pepper Plant Hot Sauce   http://www.pepperplant.com
Pitney Bowes   http://www.pb.com
RSA Data Labs   http://www.rsa.com
Security First Network Bank http://www.sfnb.com
"Security Overview for LANs and the Internet"
   http://www.hill.com/library/secure.html
SET specification   http://www.mastercard.com/set/set.htm
Social Security Administration http://www.ssa.gov
Sportszone   http://www.sportzone.com
SSL information   http://home.netscape.com
Symantec   http://www.symantec.com
TradeWave   http://www.tradewave.com
2600 Magazine   http://www.2600.com
United Airlines   http://www.ual.com
United Parcel Service   http://www.ups.com
United States Postal Service http://www.usps.gov
US Airways   http://www.usair.com
USA Today   http://www.usatoday.com
Up-To-The-Minute   http://www.uttm.com
VeriFone   http://www.verifone.com
VeriSign   http://www.verisign.com
Virtual Vineyards   http://www.virtualvin.com
Visa   http://www.visa.com
Wall Street Journal   http://wsj.com
Wells Fargo Bank   http://www.wellsfargo.com
World Wide Web Consortium   http://www.w3.org

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