

Internet Transactions Still Yield Small Change

Bart W. Stuck

Commerce via the Web is hip, but does it have real potential? Yes, but it will take two or three years—at least—to materialize.

During the past three years, the Internet has exploded into public consciousness, and businesses everywhere have been intrigued by what the 'Net can provide. A major consideration in any business is the cost to reach potential customers, and when compared with traditional marketing, sales and distribution methods, Internet-based electronic commerce can work out favorably.

Part of the Internet's appeal is that it can enable a company to capture some of the revenues currently going to intermediaries such as banks, distributors and/or wholesalers. Instead, network-based facilities generate revenues on a per-transaction basis.

In terms of an audience with spendable income, the Internet market looks compelling, depending on the targeted transactions. A growing number of PC users use their machines for communications-oriented activities, including email, Internet and World Wide Web access and browsing plus online services (see Figure 1 on worldwide electronic data connectivity market).

For the Internet alone, statistics compiled from such sources as Network Wizards (<http://www.nw.com>) Cyber Atlas (<http://cyberatlas.com>) and Matrix Information and Directory Services (<http://www.mids.org>), show the magnitude of its reach:

- 9.4 million hosts in January 1996, up from 2.8 million July 1995.
- 129 countries with direct connectivity in January 1996, up from 39 countries in July 1995.
- 78,000 commercial web sites.
- 16.9 million users in 1995 of "core Internet" (i.e., those using text-oriented services such as TCP/IP, SMTP, FTP and Telnet but not necessarily the Web), 26.4 million users of consumer Internet (i.e., the World Wide Web) and 39 million users reachable by email.

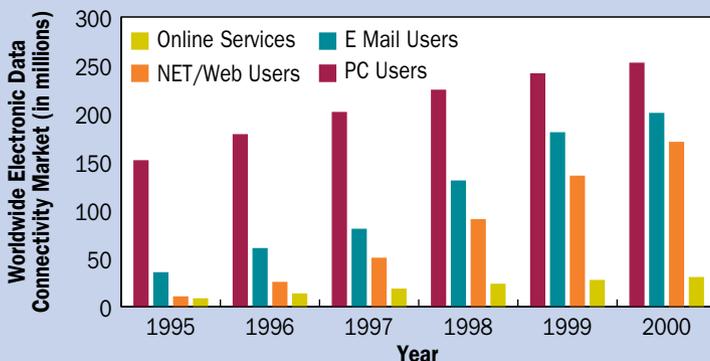
According to the same sources, the demographics of the typical Internet user are as follows:

- Median age: 30.
- 64 percent have college degrees and 93 percent have some college education.
- 67 percent are male.
- 66 percent access the Internet from work, 44 percent from home and 8 percent from school.

International Data Corporation (<http://www.idcresearch.com>) forecasts that approximately 200 million individuals around the globe will have Internet access by the year 2000, and roughly 125 million of them will be accessing the World Wide Web. The size of the market reflects the fact that, despite its flaws, the Internet works remarkably well: It is a terrific vehicle to provide connectivity from remote terminals to a wide variety of hosts

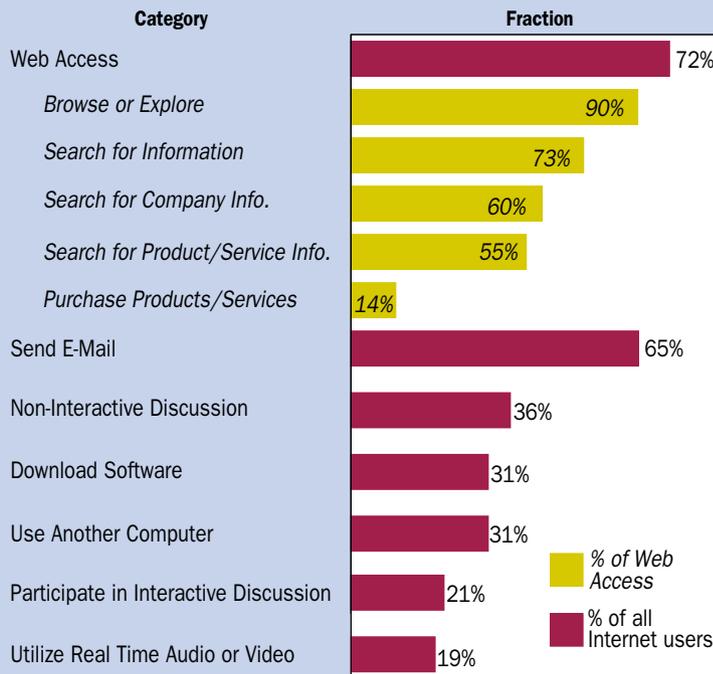
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FIGURE 1 Worldwide Electronic Data Connectivity Market



Source: Morgan Stanley

FIGURE 2 Internet Usage



Source: CyberAtlas, CommerceNet/Nielsen

for email and file transfer services virtually everywhere on earth.

Moreover, users who “surf the ’Net” join communities with whom they share interests and experiences, and they are creating communities that have shared commercial interests that can be met through the buying and selling of goods, services and information (see Figure 2).

Internet users have already exhibited their buying power in the markets for computing and datacom products. Zona Research (<http://www.zonaresearch.com>) and Volpe Welty (<http://www.vwco.com>) estimate that the market for Internet hardware, software and related services—and their counterparts in corporate intranets (private backbone networks using a routable peer-to-peer protocol such as TCP/IP, IPX or NetBEUI)—will grow from \$342 million in 1995 to \$3.3 billion in 1998.

Ingredients for Electronic Commerce

There are three types of fees for commerce conducted via the ’Net:

- Usage fees paid to Internet service providers.
- Content fees for downloading information.
- Advertising and transaction-processing fees.

In the simplest transaction, each buyer and seller can barter goods and services, and there is no intermediary—for example, electronic funds transfer between banks. The mechanics by which a buyer pays a seller are relatively straightforward. It requires deploying hardware and software as well as reliable and secure workflow processes,

which may involve preserving anonymity if desired or required by either party. The capabilities required for Internet commerce are as follows:

- Enable buyers to inquire about products, review product and service information, place orders, authorize payment, and receive both goods and services online.

- Enable sellers to advertise products, receive orders, collect payments, deliver goods electronically and provide ongoing customer support.

- Enable financial organizations to serve as intermediaries that accept payment authorization, make payments to sellers and notify a buyer that a transaction is complete.

- For hard goods, to enable sellers to notify logistics organizations electronically as to where and when to deliver goods/merchandise.

Much attention has been paid to the lack of security for electronic transactions, especially via the Internet. In response, Visa International (<http://www.visa.com>) and MasterCard International (<http://www.mastercard.com>) have developed a secure electronic transaction (SET) specification (Version 1.0, February 23, 1996) to address Internet electronic commerce business needs. The software to support these specs will be available within a year or two, and a lot of additional software to handle work processes will have to appear in the same period as well.

While there are competing standards efforts—including JEPI (Joint Electronic Payments Initiative)—a number of banks are supporting the SET effort, which Visa and MasterCard hope will attract third parties to build software and help define *de facto* standards for computers and networks worldwide. Much of the success of the traditional credit-card business came from Visa and MasterCard support of a point-of-sale protocol for credit authorization and clearinghouse functions. These enabled merchants and seller banks to be paid, and it allowed buyer banks to debit credit cards and bill users.

SET is not a listing of technical specifications, but instead outlines a series of functions that should be required for transactions:

- Provide for confidential payment information and enable confidentiality of order information that is transmitted with payment information.

- Ensure integrity for all transmitted data.

- Provide authentication that a buyer is a legitimate user of a “branded”—e.g., Visa, MasterCard, American Express—bankcard account.

- Provide authentication that a merchant can accept bankcard payments through its relationship with an appropriate financial institution.

- Ensure the use of the best security practices and design techniques to protect all legitimate parties in an electronic commerce transaction.

- Ensure the creation of a protocol that is neither dependent on transport security mechanisms nor prevents their use.

- Facilitate and encourage interoperability across software and network providers.

There appears to be little technical risk in meeting SET's goals, given the availability of common hardware platforms (processors, bus structures, disk drive formats, standardized modems and LANs), software interoperability (languages and leading operating systems), protocols (TCP/IP, IPX, OSI), graphical user interfaces (Visual Basic, Motif) and even security solutions.

But with regard to security, even though there have been advances in public and private key encryption (see this issue, pp. 33–36), widespread availability of secure electronic commerce payment systems that can meet the SET goals is not expected for two to three years. There are several reasons for the delay:

1. Time is required to build consensus among a critical mass of users—businesses and individuals—for credit-card usage, as well as to build consensus among a critical mass of users for business-to-business Internet commerce.

2. It will take several years for technical specifications and implementations to be installed, trialed and debugged.

3. It will also take several years to address how Internet electronic commerce should be integrated into internal workflow processes for businesses—e.g., handling internal transfer payments between business units of a company, handling payments between businesses and between individuals and businesses.

4. Two to three years are needed to build confidence among participants that secure electronic commerce transactions can in fact be made over the Internet.

The Internet and Commerce

Electronic commerce was pioneered through Electronic Data Interchange (EDI) which used industry-specific protocols and workflow processes to place orders, track inventory and send bills to buyers. In 1995, according to Jupiter Communications (<http://www.jup.com>), EDI was being used by more than 40,000 companies around the globe to handle \$255 billion in total commerce (roughly 10 percent of the wholesale total).

While transactions are taking place on the Internet, the current level of commerce is extremely small relative to overall commerce in the U.S., which is huge by virtually any measure. Using Census Bureau statistics, the Commerce Department estimates that retail sales (between an individual consumer and a business) exceed \$2 trillion annually, while wholesale sales (between two businesses) top \$2.5 trillion annually. In contrast, during 1995, Internet electronic commerce broke through the \$1 billion level, according to IDC, Jupiter and Forrester Research (<http://www.forrester.com>). To put the numbers in perspective, according to the Bloomberg News Service, U.S. businesses will spend roughly \$20 billion in 1996 on marketing promotional items—e.g., T-shirts, key chains and notepads—which will dwarf revenues from Internet electronic commerce.

TABLE 1 Advertising and Marketing Costs per Thousand Exposures

Category	Cost
Network Television	\$3–\$4
Targeted Business Print Ad	\$50
Direct Marketing/Direct Retail	\$500
Complex Mailing	\$2,000
Internet Home Page	\$2.75

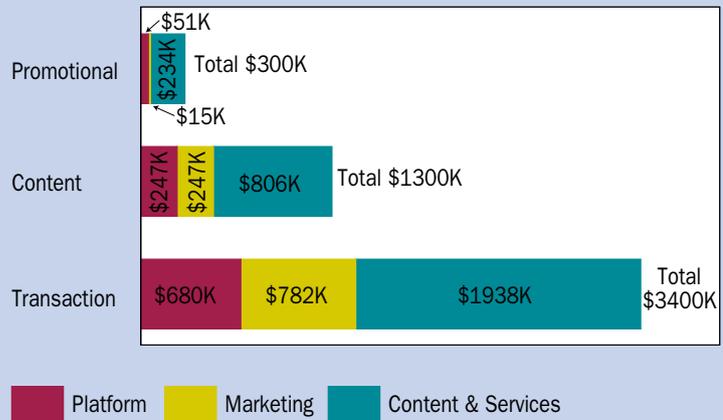
Source: Lucent Technologies GBCS
 * Internet home page assumes \$1.3 million per year cost and an average home page hit rate of 50,000 per month, 15 minutes per transaction at \$0.15 plus the cost of the Web server.

TABLE 2 Illustrative Cost Benefit Analysis—15 Minutes Customer Care

800 Call	Internet-Linked
800 Service: \$0.10–\$0.15/minute of use	12 minutes on Internet
Salary and Expense/agent: \$20/hour	3 minutes with an agent
15 minutes/live transaction: \$6.50–\$7.25	15 minutes/transaction: \$3–\$4

Source: Lucent Technologies GBCS

FIGURE 3 First Year Web Site Costs



Source: The Forrester Report, December 1995

The same sources forecast that worldwide global electronic commerce in the year 2000 will range between \$20 and \$50 billion, with roughly 80 percent from business-to-business (wholesale) transactions, and the rest from consumer-to-business (retail) transactions. These same forecasts foresee an even split—50/50—between the revenues associated with electronic transactions that are under \$10 and over \$10: a small number of over-\$10 transactions, and a large number of under-\$10 transactions.

Internet Commerce Drivers

Electronic commerce via the Internet helps solve a real problem: matching buyers and sellers in a more cost-effective manner. Since 1993, the Internet has been used to support conventional sales

and marketing activities; it has provided an alternative way to reach buyers.

Compared with traditional outreach methods—advertising and marketing—the Internet is cost-effective (see Tables 1 and 2, and Figure 3). An Internet-linked customer service operation (e.g., a call center) can save as much as 50 percent, while agents are freed up to handle more transactions, increasing productivity.

Current electronic commerce participants include both large companies and startups in different business segments. Those that concentrate on providing electronic commerce services include carriers—from interexchange, wireline local exchange and competitive access providers for private line and switched services to, eventually, cellular carriers for packet-switched transport services. Other IT/networking stakeholders in electronic commerce include computer communications hardware vendors, software tool vendors and systems integrators. Outside of our industry, advertising and public relations agencies and financial institutions have gotten involved.

The brief list below illustrates the breadth of brokered Internet electronic commerce transaction services that are being offered today, although there is no real indication of how they're doing in terms of profitability:

■ **Automobile specifications, delivery timetables, pricing and even purchasing:** Auto-by-Tel (<http://www.autobytel.com>) and Dealernet (<http://www.dealernet.com>).

■ **Flowers:** 1-800 Flowers (<http://www.800flowers.com>) and PC Flowers (<http://www.pcgifts.ibm.com>).

■ **Books:** Amazon (<http://www.amazon.com>).

■ **Computers:** NecX (<http://www.necx.com>) and CNET (<http://www.cnet.com>).

■ **Wine:** Virtual Vineyards (<http://www.virtualvin.com>).

■ **EDI:** Premenos (<http://www.premenos.com>) and Edify (<http://www.edify.com>).

■ **Advertising: Modem Media** (<http://www.modemmedia.com>) and @dMarket (<http://www.admarket.com>).

■ **Magazines:** Salon (<http://www.salon1999.com>) and Hot Wired (<http://www.hotwired.com>).

■ **Banking and Investing:** American Banking System (<http://www.absbank.com>), American Express (<http://www.americanexpress.com>), Check Free (<http://www.checkfree.com>), Checkpoint Software (<http://www.checkpoint.com>), Citibank (<http://www.citibank.com>), Fidelity Investments (<http://www.fid-inv.com>), Intuit ([\[intuit.com\]\(http://www.intuit.com\)\), Mark Twain Bank \(<http://www.marktwain.com>\), and Charles Schwab \(<http://www.schwab.com>\).](http://www.</p></div><div data-bbox=)

■ **Internet Shopping Malls:** CommerceNet (<http://www.commercenet.com>), Continuum (<http://www.continuumsi.com>), CyberCash (<http://www.cybercash.com>), Downtown Anywhere (<http://www.awa.com>), eShop (<http://www.eshop.com>), Internet Commerce Group (<http://www.incog.com>), Net Market (<http://netmarket.com>) and Open Market (<http://www.openmarket.com>).

Conclusion

In trying to forecast electronic commerce's future, it is helpful to look to the past. It has been roughly 20 years since the first commercial automatic teller machine was introduced, but by 1995, more than 122,700 ATMs had been installed within the U.S. Similarly, about 20 years have passed since the first electronic point-of-sale credit-card terminals were deployed; today, more than 554,200 units are operating on line.

In short, it will take time—certainly not before the year 2000—before Internet electronic commerce is in the mainstream of the global economy. And it will take at least another decade after that before it becomes a truly significant factor in terms of total commerce.

It is no surprise that the pace of Internet commerce-related technology is moving faster than business organizations. Buyers and sellers need to have a variety of solutions and packages that will meet their needs

in a cost-effective manner, and meeting those needs involves software and engineering execution, marketing, sales and customer support.

Hardware and software are already available for secure Internet transaction processing. The platforms are based on Intel and RISC processors, while the software encompasses browsers, information retrieval search engines and tools for authoring, servers, security, database management and development. These systems can scale from tens of transactions per day to tens of thousands of transactions per hour.

The real potential for Internet electronic commerce will be to provide not only secure transaction processing but also a new network-based marketing channel that can create new enhanced services—and also new multimillionaires who will seize the opportunity to make a lot of money very quickly—based on per-transaction processing fees rather than on a one-time fee for selling a software package. But even this is probably two to three years away □



**Internet commerce
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but American
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A this year!**