

M. Kenney and J. Curry. 1998. The Internet, New Firm Formation, and Enterprise Patterns. *Hitotsubashi Business Review*, 46 (2): 19-35.

The Internet, New Firm Formation, and Enterprise Patterns\*

December 26, 2019

BY

Martin Kenney\*  
Professor  
Department of Applied Behavioral Sciences  
University of California, Davis  
Davis, CA 95616  
fax (530) 752-5660  
mfkenney@ucdavis.edu

James Curry  
Profesor-Investigador  
El Colegio de la Frontera Norte  
Tijuana, Baja California, Mexico  
US Mail: P.O. Box L  
Chula Vista, CA 91912  
jcurry@colef.mx

\* Paper prepared for the International Workshop on Business Venture Creation and New Human Resource Management Strategies in Japan, Europe, and the U.S. sponsored by the German Institute for Japanese Studies, Tokyo, Japan, October 1-2, 1998.

## ABSTRACT

The Internet is a significant new medium of communication and, as with other major new communication media, it can be expected that it will have significant impacts on the structure and organization of the economy. This essay examines some patterns that appear to be emerging based upon the generalization of the Internet and the ability to establish profit-making enterprises to take advantage of the Internet. Startup firms such as Amazon.com have quickly established themselves as significant industry players by utilizing the Internet as their business medium. This is only one example of the utilization of the Internet in economic activity. Because of its ubiquitousness and extremely low cost, the Internet is a powerful force for transforming patterns of business activity and in facilitating new venture creation.

The paper will examine the role of the Internet in three different fields: 1) The Internet provides many opportunities to circumvent traditional retail establishments with on-line retailing. This is made even easier with the increasing ubiquity of physical logistics handling firms such as UPS and Federal Express. 2) The Internet is a medium for firms to use to increase the availability of information to the customer. By opening aspects of the firm's data system to the customer, a firm can provide the customer much greater information about their personal accounts. 3) A number of firms have begun to move purchasing functions such as bid solicitation to the Internet.

## Introduction

The late 1990s are a period during which a fundamental new communications system is being deployed in the global economy. Among all the remarkable aspects of the Internet, the speed of its adoption is, perhaps, the most noteworthy. The growth of Internet users from 5 million users in 1993 to 62 million users in 1997 and nearly 100 million users in 1998, is one of the fastest adoption rates any technology has ever experienced (Department of Commerce 1998: 8, Caginalp 1998).<sup>1</sup> Meanwhile, traffic on the Internet doubles every 100 days, according to Unet Technologies, the Internet backbone provider (Caginalp 1998). Even faster than users, the number of domain system names (registered sites) registered has been increasing at an annual rate of 40 to 50 percent, reaching about 29.7 million at the end of 1997 (Glave 1998). The number of commercial names (.com) increased from 27,000 in January 1995 to over 765,000 in July 1997. Moreover, most analysts accept this pace of growth to continue until after the year 2000, when there might be as many as 550 million users and many more commercial sites.

With such dramatic growth underway, it is hazardous to guess what the Internet will mean for the political economy. The metaphor of new technologies opening new spaces appears particularly appropriate for the Internet insofar as it is a vast new region being colonized by a nearly unlimited variety of activities with no inherent relation to the technology itself.<sup>2</sup> Moreover, in the realm of economic life, there can be little doubt that

---

<sup>1</sup> For a history of the creation of the ARPANet, the precursor to the Internet see, Hauben and Hauben 1998. For the privatization of the Internet and the creation of the World Wide Web see Reid 1997.

<sup>2</sup> Others, such as Perez (1983) have described these as new “techno-economic paradigms” and we accept these as roughly equivalent. In this particular case, the economic space metaphor seems more evocative because the current relationship of firms to the Internet resembles the land rushes of the 19<sup>th</sup> Century in the U.S. when the government opened land to settlers. Dosi (1982) further circumscribed the phenomenon to new “technological paradigms,” this seems unnecessarily limiting, because the Internet impacts and seems

this is a classic case of the creation of what Schumpeter (1969) termed a “new economic space.” The development of a particular technology certainly does not entirely determine the nature of the changes that are underway. However, as a tool, the Internet will be used in ways that will transform existing relationships such as those between buyers and sellers and workers and owners, and restructure commercial institutions such as manufacturing firms, service providers, and retailers. The Internet has already had profound effects on social norms and culture (Dery 1996; Slouka 1995; Turkle 1997). It has influenced everything from the way people access government information and manage their bank accounts to the facilitation of conspiracy mongering and teenage gossip.

As a packet switching network, the Internet is merely a medium for connections and is able to transmit anything that can be digitized. Unlike prior communication systems, such as telephony, which established a dedicated connection between two (or sometimes more) nodes, the Internet allows the simultaneous exchange of information in digital form among an unlimited number of nodes. The protocols used to transmit data across the Internet are highly standardized and readable by a multiplicity of computing platforms. To this is added the innovation of hypertext, that is the ability to almost effortlessly move from node to node at a whim. Moreover, the information content of the Internet almost completely dephysicalized or dematerialized. Its physical essence reduced the most abstract possible formulation, 1s and 0s carried by light, electrons, or electromagnetic waves. These factors: packet switching, multi-platform accessible standards, hypertext, and dematerialization are combining with a remarkable increase in

---

to be driven by far more than technology. In many parts of the industrialized world it is becoming a routine part of social interaction.

the capacity of global telecommunications systems to rapidly shrink the costs of communicating information. The extreme flexibility of the packet switched Internet allows it to be used for a large number of activities with differing technological specificities. Activities as diverse as booking airline flights, purchasing books, music, or software, or accessing public information, that formerly were intermediated by human operators are being transferred to the Internet. The dimensions and plethora of activities related to the Internet are increasingly impossible to fully comprehend and, in a sense, it is this immensity that best signifies its power.

This essay selects three general areas in which the Internet will dramatically impact the current organization of economic activity. Before that there is a brief discussion of the difficulties contemporary social sciences have in explaining the new technologies and their effects. This is followed by an examination of the impacts of on-line retailing. Next is an examination of how firms are using the Internet to increase the availability of information to the customer. The opening of the firm's data system to the customer allows a firm to provide the customer much greater information and in the process create a site able to better meet customers needs. Opening up to the customer simultaneously can draw the customer in. The next section examines the way in which firms are moving purchasing functions from administration to bid solicitation to the Internet. In this case the Internet provides a medium to reduce transactions costs (Williamson ). The concluding discussion covers the potential future implications of new Internet economic space.

## **Theorizing New Economic Space**

The Internet is a key aspect of the ongoing transformation of the global economy to a form in which materiality becomes subordinate to information and knowledge creation. More than merely a new communication system, the Internet represents the creation of an entirely novel economic space. By connecting vast amounts of computing power the Internet allows direct access to processes and procedures which were formerly cordoned off in the back offices and data processing centers of government and corporations. The vast mass of information, images, and opinions on the Internet is accessible to any computer owner with even a relatively low-cost connection. It is an interactive communications medium through which the user travels virtually; by accessing the Internet information that would have taken much time and even physical effort to find, is now almost instantly available. The traditional marketplace, once limited in both time and space, now exists everywhere, simultaneously.

Given the relative immaturity of the Internet, it is hard to draw any firm conclusions about its future, but some tentative observations are possible. Even though there is no certainty about the ultimate configuration at maturity, businesses such as stock trading, bookstores, airlines, and PC firms are already on-line. Virtual stores are being created with virtual inventories far larger than any physically existing store. Because it is entirely computerized, the customer rapidly pinpoints the exact product desired by using specially tailored database query software. These products are drop-shipped from a production or distribution node to anywhere in the world using the various courier services that are now also on-line. The Internet eases many market entry barriers because

of minimal startup costs. This dramatically accelerates the realization of an idea and allows successful ventures to grow exponentially.

The dematerialization that the Internet represents is extremely powerful. It is no longer necessary to disseminate information in the physical medium of paper, floppy disks, or CDs. It can now be communicated through electronic impulses and/or beams of light (fiber optics). Such flexibility and ease of use accelerates information flow and communication that can facilitate new knowledge creation and novel forms of social production. Though not the only area in which this is happening, it has been in software development where these changes have been most pronounced. While there is still only limited distribution of commercial-class software over the Internet, there already exist vast downloadable stores of freeware and shareware programs, and numerous product demos, service updates, and bug fixes. Many software developers are using the Internet to publicize and distribute test versions of innovative software programs such as the Opera browser and The Brain user interface. The Internet has also facilitated the development, distribution, and maintenance of the alternative freeware Linux operating system and Apache web server. These programs are the result of the collaborative efforts of thousands of users/developers for whom the Internet serves as a virtual software development campus. According to the chairman and founder of Netscape, Jim Clark (1995: 70) new business models are possible because

The Internet is low cost. We proved that by using the Internet to distribute our first product, and we were able to build a customer base of 10 million users in just about nine months. Our only expense was the engineering cost of making the program . . . So we see this potential for low cost distribution of any kind of intellectual property—whether software, or pictures, or movies, or compact disks, or anything that can be represented as bits.

Typically, when an important new technology is introduced there is an initial period during which the technology is used in a way that resembles the incumbent technology. The innovators do not immediately comprehend the possibilities inherent in the new technology (Marx ; Rosenberg 1976). There are many examples of this in the introduction of the Internet. Taking their cue from the contemporary suburban shopping experience, many early commercial web developers believed the Internet shopping would be conducted in a similar or analogous manner. So, they attempted to create electronic shopping malls. This approach disregarded the web's hypertextual nature, i.e., its just as easy, if not easier, to jump from one discrete site to another as it is to navigate through a discrete virtual mall. The emall idea did not take into account that there is no inherent or compelling reason for users to enter the emall (Economist 1997).<sup>3</sup> Other web sites took their cue from low quality multimedia producers, who merely transferred printed content onto CD-ROMs. These web sites were simply digitized versions of catalogs previously available by mail, or postings of newspaper content or other information. Here, web site authors saw the Internet as just another form of publication. This also failed.

The sociology of knowledge has not given great attention to the connection between technical change and social science theory. This is a remarkable oversight as the classical political economic theorists such as Smith, Ricardo, and Marx were clearly inspired by such development. Today, the concatenation of computers, semiconductors, and telecommunications made usable by software has unleashed a profound set of technological developments that might easily be the basis for another long wave of

---

<sup>3</sup> The creators of electronic malls neglected to understand that the mall was a response to suburbs and automobiles. It was a replacement for the streetcar and the downtown shopping district. People would "travel" to Internet sites through communications links that were largely oblivious to distance (see, also Cairncross 1997).



economic growth. This is not unlike the wave of growth based on the industrial complex centered on the automobile, which provided a set of high growth industrial core activities (automobile and associated production) as well as an infrastructural base for new economic activity. Providing a nearly universally available transport structure which radically reduced the cost of transporting goods and people, the automobile complex became a profit center in its own right. It also led to the creation of entirely new ways of doing business, novel types of physical communities and social interaction, even new forms of cultural and artistic expression. Vast quantities and assortments of both standardized and specialized commodities and services became available, which both fed existing demand and stimulated additional demand. The Internet comes on the scene as an overlay to the already extant automobile transport and telecommunications complexes. The Internet reduces further the economic costs (i.e., transaction and time-associated costs) of automobile-based commerce, as well as providing the possibility of reducing the external costs (pollution, resource depletion, injury, etc.) associated with it. Also, like the automobile industries, the information technology industries (both software and hardware) provide a new value-generating core for the economy. These industries are already generating a new virtuous cycle in which new technologies stimulate new business and commerce models which in-turn further stimulate demand for information technology products and so on.

These developments also pose profound dilemmas for the way we understand our world. For example, what happens in economics when the cost of production is great, but, as in the case of software, there are almost no further costs for reproduction? Software companies may spend millions of dollars to develop what amounts to a

prototype, which is then copied and distributed at minimal cost. This distribution function becomes a trivial part of the overall process; stamping out CD-ROMS and putting them in boxes. Unlike most physical goods, where most of the labor is spent manufacturing replications of a design, in software the design is the product, relegating what is traditionally considered to be manufacturing to distribution. Moreover, the product itself is not consumed, nor does it wear out, in the same way tangible, material products do. The devaluation of a software product derives through the creation of more advanced software (new knowledge) which supercedes it. The core workforce of a software producer is directly involved in the creation of the firm's intellectual property, rather than giving the firm's intellectual property material form as is the case with more tangible commodities. That intellectual property is then directly utilized by the purchaser of the software.

This trivialization of physical manufacturing not only implies a transformation in the chain of linkages between the producer and the consumer, but in the social structure of production as well. Rather than merely proffering products for sale in the marketplace companies must seek to develop a standard and find a way to get that standard accepted. Software and hardware manufacturers, independent software developers, and consumers evolve the standard in complex interaction that takes many forms. For example, Netscape and Microsoft provide their browser software free to users in an effort to capture "mind" share and expand the market for their other products (Lewis 1996: 70). Recently, Netscape went even further providing, what many software firms consider the crown jewels, the source code itself to all parties. Taking advantage of an existing, non-commercial, standard, IBM recently announced that it will bundle the Apache web

server, which already holds about 50 percent of the market, with its server products (Heskett 1998). The objective, of course, is to encourage both consumer and software developers to use a particular software program or set of associated programs. Netscape wants to encourage adoption by users and by developers and IBM is attempting to exploit an existing standard through the provision of additional services and software add-ons. By using software, the user actually gives value to the software. By learning to use software users sunk costs increase discouraging switching. In recognition of this dynamic, some analysts have suggested that software companies should pay users to adopt their program.<sup>4</sup>

An example of these curious economics is McAfee Associates, a producer of antiviral software, which adopted the capture “mind share” strategy and pioneered free Internet software distribution. McAfee has said “if you give software away and assist people as well, you’re almost bound to make money” (Leon 1997). After providing free software to five million users, McAfee shifts into a marketing mode and start charging for upgrades, add-ons, and new updates. Since computers and networks are constantly evolving, the customers actually evolve with the software in the form of upgrades. From the perspective of traditional economics, practices such as giving products away for free seem foolhardy and even perverse. Recently, however, some economists and business theorists have begun rethinking traditional economic concepts to encompass the value-added from knowledge creation and the “winner-take-all” aspects of capturing or becoming standards in information-and communication-intensive industries (Nonaka and Takeuchi; Arthur 1994; David 1986).

---

<sup>4</sup> Microsoft recently implemented a new twist on all this by charging users for beta copies of its upcoming Windows 95 revision (Windows 98).

Economic puzzles like these are only the tip-of-the-iceberg, there are other phenomena that go beyond the traditional social sciences. For example, at a number of web sites online user communities actually become an integral component of the value of the site. For example, reader's reviews are posted at Internet bookseller, Amazon.com (Hagel and Armstrong 1997). The user community creates value in a profoundly social sense. This goes beyond the ideas of sociologists such as Granovetter (1985) in his discussion of the embeddedness of economic institutions. As we shall see, the social (community) interaction process and its concomitant communication of information and opinion creates the value of a web site. The ability to search online for a book and purchase it is reproducible, the online community is not.<sup>5</sup>

The creation of online or virtual communities, occurs through the medium of virtual places. Certainly, worldwide web servers provide Internet surfers with the electronic analogue of visiting an address (Batty 1997), though it is really only a software construction on a computer server connected to a telecommunications pipeline through which the user retrieves information (Mitchell 1995). And yet, the metaphor of place in cyberspace is rapidly becoming the accepted by most Internet users. This was not always the case, as late as 1990 Mitch Kapor and John Perry Barlow (1990) observed that old concepts of property did not apply well "in a world (that of the Internet) where there can be none." This idea of a virtual place in space is a vexing issue in capitalist economies where space is measured, marked, and owned.

---

<sup>5</sup> The etymological roots of the words "communication" and "community" indicate the relationship between these two words. One's community is with whom one communicates.

## **The Internet and Commerce**

By the early 1990s the Internet already consisted of a vast collection of useful information and downloadable software. However, most of the tools for accessing this information were primitive and required a certain amount of expertise and system knowledge on the part of the user. Over time, reflecting a long tradition of collective development of network technologies, standards, and protocols, all designed to make the Internet more useful to the academics and computer scientists who were its main users, a number of key innovations were developed. The breakthrough came with the World Wide Web (WWW) and Hypertext Mark-up Language (HTML) protocols, which were developed by researchers at the European Laboratory for Particle Physics (CERN) in Switzerland in order to facilitate the exchange of information among physicists. After this it was an obvious next step to develop special software, the browser, which made the utilization of these and other protocols invisible to the user. A number of different browsers were developed, some more functional than others, and were distributed freely over the net. One of the early browsers, Mosaic, developed at the National Center for Supercomputing Applications (NCSA) at the University of Illinois Urbana-Champaign became wildly popular with millions of copies downloaded in a few short months after its release. The group that created Mosaic then moved to California to build the first commercial grade browser, forming the company which would later become Netscape. Netscape added the final key innovation, building secure transaction capability (SSL) into its browser (Quittner and Slatalla 1998). This enabled Internet users to safely and conveniently exchange money for products to be delivered over the net itself or by the already extant and highly sophisticated delivery systems such as Federal Express, UPS,

or the USPS. Once all these pieces of the puzzle were in place, the success of the Internet as a commercial medium was all but guaranteed.

Despite the seemingly obvious commercial applicability of the Internet, no one dominant model of doing business has yet emerged. The Internet has presented itself to business as uncharted territory, forcing firms to blindly grope for strategies that work. Those firms who wish to succeed in Internet commerce have had to confront three unique characteristics. The first is ubiquity. By this we mean that all "places" on the Internet are accessible to the user on what is essentially an unlimited and equal basis. The user can go anywhere on the net with a minimum of effort; there is no inherent technological reason for the user to start at a particular point. The proprietary network services that predated the rise of the WWW in the mid-1990s, such as America On Line (AOL), Prodigy, and CompuServe, have all had to adjust their business models as all anyone really needs is a connection to the Internet and a web browser. Moreover, most, if not all of the services provided by more delimited systems are available at stand-alone web sites that are either free or by subscription. Thus, commercial content providers must find ways to attract people to their site, either by providing attractive content for them to consume, providing some service or product they want to use or buy, or by creating a system for purchasing non-Internet specific products that offers something conventional retail channels don't.<sup>6</sup>

---

<sup>6</sup> Much has been made by "old-line" journalistic sources of the fact that anyone can disseminate information over the Internet, reaching an audience potentially in the millions. A piece presented on "60 Minutes" cited the existence of numerous web sites covering such things as UFO conspiracies, theories about what caused the TWA disaster, and Neo-Nazi beliefs, all of which are not held to any standard of accuracy. What these critics fail to understand is the Internet is a vast collection of sites and that the user generally has to seek out the information he is interested in. Most of these sites will never be seen by most net users. The "market" for crackpot journalism existed prior to the Internet and it is unlikely that the Internet will cause it to grow at any appreciable level. To the contrary: those brands which have a reputation for accuracy and utility will thrive, while marginal sites will stay marginal.

The second important characteristic of the Internet is interactivity. The Internet itself was developed through a remarkable process of interaction by researchers spread throughout the world. Commercial publishers who wish to succeed on the Internet must offer more to customers than that which is ordinarily available in print or from some other media. One of the more successful web publishers has been the Wall Street Journal, which has seen steady growth in its paid subscription base since it started charging about 2 years ago. The Journal's site offers not only standard print content, but also a wide range of content and services not found in the print addition. These include articles from other Dow Jones publications, past article search and retrieval, customized stock quotes, job finding information, a database of company background information, interactive discussion of various current news topics, a news audio feed, the ability to customize the web page to the user's interest, and numerous other features. The Journal site serves both as a substitute for those with limited access to the print version, such as overseas readers, and as a complement to print subscribers who wish to access additional services such as company and stock tracking from a source they know and trust.

The interactive nature of the Internet is also giving rise to new forms of collaborative activity. Some software firms place nearly completed software (beta releases) at a web site and encourage computer aficionados to install the software and test it for bugs, functionality, and features. The aforementioned Linux and Apache software programs have relied on the Internet for both their dissemination and their continuing technological evolution. Here, consumers actually participate in the knowledge creation process by using a new product and communicating the results back to the company. Netscape and other companies can pre-release unfinished versions of their software over

the Internet, giving consumers the opportunity to become beta testers, finding and reporting bugs and commenting on changes and new features. This diminishes some of the burdens of in-house testing and decreases the distance between software creators by creating an information feedback loop. Moreover, integrating a subset of customers directly into the product development process also accelerates the creation of demand for the finished product.

The third important characteristic of the commercial Internet is speed. Because the Internet is an ubiquitous, interactive system based on a multipurpose digital computing platform, changes such as system software upgrades, new standards and protocols, and new publications (content) can be developed and disseminated very rapidly. The availability of out-of-the-box network and network server hardware and easily adaptable software applications such as credit card billing systems and searchable databases enables rapid development of commercial systems at very low cost. Moreover, many Internet-based businesses have been developed as overlays on existing infrastructure, which further reduces startup costs and time of deployment. The rapidity at which businesses can be established on the Internet places a great deal of emphasis on being the first in a particular market category. An interesting case in point is Amazon.Com, an Internet bookseller based in Seattle. By relying on existing systems of distribution as a sort of retailing adjunct to them, Amazon was able to start operations quickly and efficiently (Bianco 1997). Publicizing itself over the Internet by purchasing advertising link space from frequently visited sites such as Netscape's, Amazon was able to develop a high volume business in a very short time (Southwick 1996). Founded in 1995, Amazon did over \$50 million in sales last year (Marcial 1997). Barnes & Noble,



an important innovator of large, high variety, bookstores that sees Internet book selling as a logical extension of its own large-scale distribution and inventory-tracking system was left to play catch-up.

Given the assistance of customers, product evolution in Internet software is extremely rapid (Hanford and Lyon 1996; Reid 1997). The leading personal computer software company, Microsoft, only saw the potential and danger of the Internet in early 1994, though after that it moved very quickly to exploit the new opportunity and overtake the leader, Netscape. Microsoft's strategy was to rapidly improve its Internet browser and give it away – an excellent method of gaining market share. By the end of 1997, Microsoft was rapidly taking market share from Netscape and a “browser war” and legal war raged as Microsoft worked to cripple Netscape.

The Internet economic space opened quickly and continues to provide many possibly transformative opportunities. Leadership roles in previously stable and even stagnant activities such as book selling, travel agency, and telephone ticketing are in a state of flux. For the airlines, the Internet made it feasible to create online reservation systems that they could control and use to reduce the power of travel agents. There were also significant savings, because the cost of issuing an e-ticket is only one dollar, whereas telephone ticketing costs eight dollars per ticket—compelling economics for the highly competitive airline industry.

The local newspaper as a materialized source of information delivery could also be impacted by the Internet. The initial approach, to simply put the newspaper on a web site, has failed. What is likely to occur is that different components of the newspaper are replaced by various web sites. Already there are entertainment oriented “lifestyle

guides,” such as Microsoft’s Sidewalk sites. There are many sports and business-oriented web sites that might replace the sports and business sections. Like the Wall Street Journal, these sites offer a level of interactively accessible information that would be cumbersome in printed form. The most important impact on newspapers might come from Internet based classified since classifieds are a key source of revenue for newspapers. Inexpensive local classified ad sites are now available (Weber 1998). It is likely that they will eventually become interactive, allowing direct responses to ads through email, or even more interactively through a chat program. The variables that will determine the fate of newspapers hinge upon the issue of whether readers appreciate the variety, including national and local news, sports, business, weather, and advertising etc. in hardcopy? The electronic analog does not appear satisfactory at this moment.

It is still quite early in the development of the Internet and related data communications, so the possibilities of new medium are only beginning to be explored. Old activities such as making phone calls, sending mail, and ordering goods and services are already migrating to this nearly instantaneous environment. And, as important, for this paper, many formerly relatively sedate industries are finding parts of their value chain absorbed and accelerated to computer and Internet time. As a result, some local businesses are going global and experiencing dramatic growth, while other local businesses are being outflanked by competitors from anywhere on earth and experiencing rapid decline.

### **Customer Service Functions**

Customer service functions have always been a time-consuming person-to-person activity, however many of these are highly routinized. An important recent step in

automating customer service was telephone call processing, but this was a slow system with very low bandwidth. More sophisticated digital interchanges customer service would have to wait until the consumer had a device able to handle greater amounts of digital information, i.e., the PC and a computer modem. When the installed base grew sufficiently and the technology was sufficiently mature it became possible to place information on a server open to customers. This redefined customer service, increasing the level of provision while decreasing the cost. This was possible because most interactions are entirely standard. For example, many customer questions are for routine information such as store hours and directions. The answer to such questions can be codified, indexed, and stored on a server to be accessed online and downloaded. For simple questions such as directions the Internet can download a map, whereas on the telephone tedious and error-prone verbal instructions are necessary.<sup>7</sup>

In addition to seeking routine information, customers are also attracted to sites that provide detailed information about products or services. A potential customer can browse several competitors' sites, as well as third party sites which discuss the product in question, compare prices and features, gather general information about a particular product or type of product, taking as much time as desired before making a purchase. A recent study at the Fuqua School of Business at Duke University found that consumers were more likely to buy products from sites that provided comprehensive information than from sites that had slightly lower prices but little in the way of useful information (Bransten 1998).

---

<sup>7</sup> As more automobiles are transformed into mobile offices, it will be possible through mobile phones to access Internet maps to be downloaded to a notebook computer, or to an onboard travel computer.

The types of customer service provided online depend upon the product or service. For example, software companies make available various software patches or add-ons to current products. Increasingly, software programs such as Microsoft Windows or Netscape Communicator have the ability, upon a prompt from the user, to automatically check for updates and then download and install them. Delivery through the Internet is essentially costless and in the process develops a connection with the customer. In other cases, service bulletins or product-related information are placed on company web sites for informational purposes. These relatively straightforward applications replace or augment previous product upgrading or information dissemination techniques.

Global logistics firms, such as DHL, UPS, and Federal Express, have taken the potential for customer service much further. By opening the tracking portion of its computer system to Internet users Federal Express was an aggressive first-mover when it began offering customers the ability to track their packages throughout the delivery system. This initial stage was a one-way information provision service. The customer received information increasing their knowledge about the location of the shipment and its arrival time (Lappin 1996). At the business strategy level Federal Express reconceptualized the relationship between its internal information and what created value for the customer.

This success of its initial effort spurred Federal Express to consider other ways of using the Internet. Based on its experience with the tracking service, a web site was developed to permit customers to use the Internet for all shipping functions. The features now available include scheduling pick-ups, detailed maps of all drop-off locations, rate

charts, and other information regarding international customs regulations. Moreover, the site offers free downloadable software that speeds the processing of shipments, allows the user to store addresses in an address book, maintains a shipping history in a log, and creates and prints labels (Fedex.com 1998). Many shipping office functions have been transferred onto software and into data communications networks. Human intermediaries and physical documents have been replaced by software. Not only is it less expensive than previous methods, but it also provides the mechanism for creating whole new ways for firms and their customers to interact. This in turn creates new sources of value for the customer--the ability to know when a package arrives at its destination for example, and new sources of value for the firm--by using the same ability to find and correct problems and inefficiencies in the system.

### **Ecommerce**

The reasons persons purchase retail items are complicated and, at times, non-rational (we discuss interfirm purchasing in another section). Of course, one reason is plainly utilitarian, but, of course, there are other more emotive motivations. Today, the Internet is establishing an entirely new retailing channel that is already affecting traditional retail on the industry on a number of dimensions. As we shall see, Internet sales are significantly more complex than simply creating an online catalog. A web site must create a feeling that it is the place to go to buy something.

According to the Fred Smith, the founder and CEO of Federal Express, “The Internet is going to make it very difficult for anybody in a middleman position to stay in business ... the same type of effect that Wal-Mart had in the retailing sector – that’s what the Internet is going to do to every business (Lappin 1996: 286).” No previous

communications technology has allowed the customer to personally search databases of, for example, books, autos, software, airline schedules, and then complete the purchase with no human intervention. Traditional commercial locations deployed a service worker that communicated with a customer while interfacing with a computer and performing search and booking procedures. With Internet browser technology it is possible to remove the service worker as a translator between the analog customer and the digital database. This makes it possible to reconceptualize activities that formerly required human service workers and directly connect customers to firms' computers. With credit card payment the entire process is electronic with the exception of delivery and with some goods, such as insurance, stock certificates, and financial instruments, there is nothing but an accounting notation in a computer.

There are remarkable benefits for a retailer that can transfer sales activities to the Internet, though they vary by product or service. For many services in which there is no physical component at all it may be quite easy to move the entire process online. A general benefit is that the Internet retailer can hold far less inventory than a conventional retailer, who must have the items in inventory thereby tying up capital. The difference can be striking. For example, Amazon.com, the online bookseller, turned its inventory over 42 times in 1997, whereas its largest competitor, retail store-based Barnes & Noble turned inventory only 2.1 times (Willis 1998). Moreover, a significant portion of Amazon's inventory is held by distributors who drop ship the items directly to the customer although this is changing as Amazon attempts to develop a system which buys directly from publishers (Bianco 1997). Book retailing could experience even further radical changes as new electronic book devices arrive in the marketplace, devices which

allow books in digital form to be downloaded by phone or potentially over the Internet. In another inventory-sensitive market, automobile retailing, a single firm, Auto-By-Tel, had an annual rate \$6 billion in sales at the end of 1997, up from \$1.8 billion the previous year (Reuters 1998).

Lower inventory reduces risk from market vagaries. Internet-based retailing eliminates the costs of retail branches, thereby lowering initial entry costs and the fixed costs associated with retail stores. Moreover, the use of the Internet for sales combined with delivery firms such as Federal Express and UPS extends the customer base from the relatively local reach of individual stores to anyone anywhere in the world that has access to a PC with a modem and a credit card. In addition, because the merchant's server operates constantly, purchases can be made day or night, any day of the year. Distance is dramatically shrunk while time is extended to its maximum.

Complicated sets of purchasing decisions such as booking travel and hotels can be undertaken on-line without human intervention. For example, air travel, car rental, and accommodations can be booked at an online travel site. The on-line travel agent can go far beyond a telephonic travel agent by providing much broader and more detailed information including textual descriptions, images, and even reviews of the various destinations. In effect, huge databases of information can be made available to the customer in such a way as to allow users to "customize" their travel agenda.

The convenience and availability of information are important advantages. However, online travel agencies have yet another advantage, namely, they can post comments from previous travelers, thereby creating interaction and information exchange. This multiplies and simplifies the "letters to the editor" columns often in

newspaper travel sections. The interactive possibilities permit online discussions regarding specific types of travel, such as ecotourism, folk festivals ad infinitum. This virtual community adds value to the site and is a mechanism for retaining customers who can change sites at the click of a button. Moreover, the knowledge generated through these discussions could permit the discovery of new market needs, thus giving rise to new products. The community and its interactions add value that the travel agency does not need to compensate.

Compare the economics of an online travel agency with that of a conventional agency. At the conventional agency a person deals directly with the customer in a situation in which the time spent with a customer on a booking is a direct cost. In essence, each interaction with the customer is a cost. One estimate is that it costs an airline one dollar to book a flight on the Internet and eight dollars through an airline customer agent (Department of Commerce 1988: 28).<sup>8</sup> In addition, travel agents can make mistakes, however on the Internet the customer takes all responsibility for the reservation. In the case of the conventional travel agency return business is dependent upon building an interpersonal relationship with the customer. The online travel agency uses the online customer community to develop relationships between the customers and with its site. This ensures repeat business (Hagel and Armstrong 1997).

The travel agent's experience combined with a personal relationship with the traveler can be seen as knowledge base that permitted them to make recommendations to improve the traveling experience. Customers not utilizing this knowledge base, in effect subsidized those using the knowledge. The travel agent was a form of expert knowledge.

---

<sup>8</sup> Traditionally it cost the airline 10 percent of the ticket cost. In late 1997 the airlines cut the cost to 8 percent or \$50, whichever was smaller.



In the online world the host computer is not an expert. However information on travel habits, previous travel, and other characteristics (i.e., a profile) allows it to search its database and match it with similar profiles to be used to offer “personalized” services to a customer.<sup>9</sup>

The success of online travel agencies is becoming quite clear. For example, Microsoft’s Expedia site launched in 1996 had more than \$12 million in monthly sales in January 1998 and was growing quickly (Lipton 1998). As important, the U.S. travel industry is being reorganized, not only with new entrants such as Microsoft, but also as the airlines are reducing the fees they pay to travel agents and encouraging customers to buy tickets directly through their web sites. In the process these web sites are being built into virtual places. For those desiring human contact, the offline travel agent will remain available, but increasingly they will be paid for directly by the user, witness the increasing use of service charges by the offline travel agencies (a tactic that will accelerate the movement of customers to the online agencies).

To recapitulate, the technical capacity for online retailing can be understood by seeing the two tendencies that were integrated by the Internet. With decreased cost of long distance telephone line many transactions had already become telephonic, as in the case of services such as tickets and products such as software, computers etc. The development of sophisticated database management software and the use of corporate intranets serviced by large-scale computer servers meant that the purchasing process had been largely computerized. The service worker using a networked computer to take an order was merely an intermediary between the customer and the corporate database. On

---

<sup>9</sup> In the case of Microsoft its online travel agency, Expedia, will only accept Microsoft Explorer, thus excluding all Netscape Navigator users. In contrast, other online travel agencies will accept both Explorer

the demand side, the increased usage of email, the development of expensive, user-friendly browser, personal computers with faster modems, and more persons attached to high-speed local area networks created a large installed base of potential consumers. The final step was to habituate customers to purchase items through cyberspace. As more and more consumers are online, old methods of marketing will be eclipsed since consumers have vastly more information at their disposal, not only about the products available, but about their prices as well. Premium list pricing will be more difficult to maintain as consumers can nearly effortlessly find the lowest priced vendor, or go to a site that aggregates the price information of several vendors.

### **Interfirm Transactions**

In any economy the total sales in the value chain preceding the consumer far exceed final sales, so even small efficiencies generated in interfirm trade can have a massive impact on the macroeconomy. The introduction of powerful new communication system such as the Internet create many opportunities for innovation. In effect, the Internet creates the potential to dramatically lower transaction costs and develop new ways to manage the supplier chain. The opportunities for cost savings are enormous. The costs of interfirm transactions in the U.S. alone are estimated to be approximately \$250 billion or close to 5% of total GDP, and much of that is simply the overhead associated with the processing of paper documents (Kershner and Geraghty 1997).

The effort to move interfirm billing and production logistics to electronic media did not begin with the Internet. However, earlier efforts were idiosyncratic to particular firms and industries. The generalization of the Internet and its various protocols creates

---

and Navigator.

the possibility of developing one language for all interfirm data communications. Some firms are already developing what they term e-forms to standardize and facilitate online interfirm transactions, the paper documentation is simply the physical embodiment of information to be transferred from one computer to another computer. With the computerization of the entire logistics and distribution functions of an increasing number of firms, the stage is set to use the Internet to interconnect firms and eliminate the human and paper intermediates. Moreover, these systems can be interconnected with marketing and retail functions making the production system highly responsive to fluctuations in demand. This is underway today and its completion will create the base upon which to build even more sophisticated systems.

A web site need not be simply for sales information provision, it can also be used to solicit bids for supplies. This works especially well for goods that are highly standardized or can be described in great detail through online specifications. General Electric is the leader in transferring standardized purchases to the Internet. By early 1998 it was purchasing \$5 billion of supplies per year through an online bidding process. The immediate savings from transferring the entire purchasing process online are substantial, but not fully quantifiable. However, an important indicator is the fact that it typically costs \$50 to process a paper purchase order but only \$5 in electronic form (Smart 1996). Another benefit is that posting the requests for proposals allows suppliers not previously having relations with GE or with relations to other divisions to respond. For both GE and the supplier there is a significant reduction in information search costs. The benefit to GE is now it can secure lower cost goods. The routine purchase of standardized goods is often largely price-based (given that quality is the same) and thus the parameters of

variation are minimal making ideal for purchase through the Internet. Naturally GE's success in using the Internet is encouraging (forcing) competitors to follow suit and is an example to firms in other industries.

The Internet will have significant impacts on the nature of interfirm relations. As an increasing number of inputs are purchased through the Internet, there should be a reduction in the role of corporate purchasing agents, as the bidding will be conducted electronically. The costs of searching for suppliers and customers are being dramatically decreased, thus lowering transaction costs. Automation of purchasing and other interfirm links is only at its earliest stages, thus far the changes have centered on lowering costs. There has been less progress in using the Internet to create more value.

## **Discussion**

This essay has reflected upon the interaction between the increased emphasis on knowledge-creation in organizations, information processing, and temporal acceleration. The removal of routine mental activity such as arithmetic calculation from human beings and its transfer to computers will be seen as of equal significance as the removal of the tool from the workers hand and its transference to the machine in the First Industrial Revolution. This freed the human mind for involvement in higher order creative tasks. Rather than devaluing the productions of the human mind, it appears that value in the twenty-first century will become even more dependent upon the creations of the human mind mediated by computers and data communication and processing.

As knowledge creation became a focal point of our thinking about economic activity, managers faced an environment with two attributes: increased emphasis on knowledge creation and a transience of existing products and knowledge. The

acceleration of new knowledge creation sped up the devaluation of the concrete results of knowledge creation, the products. In electronics and computer networking knowledge creation was rapid and the pace of change was dramatic. For managers, understanding and operating at the industry's speed will be the difference between success and extremely rapid failure.

In even the most material-intensive industries, the pace of change has accelerated. In the high-technology fields, even industry leaders such as Intel and Microsoft have every reason to be paranoid as the pace of change engulfs all firms (Grove 1996). Stable industries will be destabilized by changes often coming from outside their current business areas and often by firms used to a more rapid pace of change. Creating new mental models for thinking about how their firm must change is being recognized as the most important management task (see Davis and Meyer 1998 for example). In other words managing knowledge will become even more critical.

## REFERENCES

- Arthur, W. Brian. 1994. Increasing Returns and Path Dependence in the Economy (Ann Arbor: University of Michigan Press).
- Bianco, Anthony. 1997. Virtual bookstores start to get real." Business Week Online (October 27), <http://www.businessweek.com>.
- Batty, Michael. 1997. "Virtual Geography." Futures 29 (4/5): 337-352.
- Bransten, Lisa. 1998. "There's More to E-Commerce Than Just the Lowest Prices." Wall Street Journal Interactive Edition, <http://interactive.wsj.com>.
- Caginalp, Elizabeth. 1998. "The Internet Economy." Computer Reseller News (April 27) 786.
- Cairncross, Frances. 1997. The Death of Distance (Boston: Harvard Business School Press).
- Davis, Stan and Christopher Meyer. 1998. Blur: The Speed of Change in the Connected Economy (Reading, Mass: Addison-Wesley).
- Department of Commerce. 1998. The Emerging Digital Economy (Washington, DC: U.S. Department of Commerce).
- Dery, Mark. 1996. Escape Velocity: Cyberculture at the End of the Century (New York: Grove Press).
- Dosi, Giovanni. 1982. "Technological Paradigms and Technological Trajectories." Research Policy (11), 3: 147-162.
- Economist. 1997. "In Search of the Perfect Market." (November) <http://www.economist.com/editorial/freeforall/14-09-97/ec1.html>.
- Federal Express. 1998. <http://www.fedex.com/us/> (June 6).
- Glave, James. 1998. "Dramatic Internet growth continues." Wired News (February 16) <http://www.wired.com/news/news/technology/story/10323.html>.
- Granovetter, Mark. 1985. "Economic Action and Social Structure: The Problem of Embeddedness." American Journal of Sociology 91: 481-510.
- Grant, Linda. 1997. "Why FedEx is flying high," Fortune (November 10).
- Hagel, John and Arthur Armstrong. 1997. Net Gain: Expanding Markets through Virtual Communities (Boston: Harvard Business School Press).

Hauben, Michael and Ronda Hauben. 1998. Netizens: On the History and Impact of Usenet and the Internet <http://www.columbia.edu/~rh120/>

Heskett, Ben. 1998. "IBM fuels 'freeware' efforts" C-Net News.com (June 18)  
<http://www.news.com/News/Item/0,4,23364,00.html>

Hickey, WSJ article

Kapor, Mitch and John Barlow. 1990. "Across the Electronic Frontier." Electronic Frontier Foundation (July 10).

Kerschner, Edward and Michael Geraghty. 1997. "Converging Technologies." PaineWebber (September 1).

Lappin, Todd. 1996. "The Airline of the Internet." Wired (December): 234-241.

Leon, Mark. 1997. "Bright Idea or Loose Bulb?" The Red Herring (January): 52-53.

Lewis, Ted. 1996. "Surviving the Software Economy." Upside (March): 66-79.

Lipton, Beth. 1998. "New Territory for Net Travel" CNET NEWS.COM (April 3).

Marcial, Gene G. 1997. "A new chapter for Barnes & Noble?" Business Week Online (October 13), <http://www.businessweek.com>.

Mitchell, William. 1995. City of Bits (Cambridge: MIT Press).

Nonaka, Ikujiro and Hirotaka Takeuchi. 1995. The Knowledge-Creating Company (New York: Oxford University Press).

Perez, Carlota, 1983. "Structural Change and the Assimilation of New Technologies in the Social and Economic System," Futures 15(5), 357-375.

Quittner, Joshua and Michelle Slatalla. 1998. Speeding the Net: The Inside Story of How Netscape and How It Challenged Microsoft (New York: Atlantic Monthly Press).

Reid, John. 1997. Architects of the Web (New York: John Wiley & Sons Inc.).

Reuters. 1998. "E-commerce a boon to consumers," ABC News-Reuters (July 5),  
<http://www.abcnews.com/sections/tech/DailyNews/neteconomics980705.html>

Rosenberg, Nathan. 1976. "Marx as a Student of Technology." Monthly Review 28 (July/August): 56-77.

Schumpeter, Joseph (abridged by Reindig Fels). 1969. Business Cycles (New York: McGraw Hill Inc.)

Schwartz, Evan. 1997. "It's! Not! Retail!" Wired (November): 218-223, 287, 294.

Slouka, Mark. 1995. War of the Worlds: Cyberspace and the High-Tech Assault on Reality (New York: Basic Books).

Smart, Tim. 1996. "A Cheaper Way of Doing Business." Business Week (August 5).

Southwick, Karen. 1996. "Interview with Jeff Bezos, Amazon.com" Upside (October): 29-34.

Turkle, Sherry. 1997. Life on the Screen : Identity in the Age of the Internet (New York:: Touchstone).

Williamson, Oliver. 1985. The Economic Institutions of Capitalism (New York: The Free Press).

Willis, Clint. 1998. "Does Amazon.com Really Matter?" Forbes ASAP (April 6).