Measuring the Internet Economy

June 6, 2000

University *of* Texas

www.internetindicators.com

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Executive Summary

The Internet Economy supported an additional 650,000 jobs in 1999 as revenues soared to over half a trillion dollars, according to the University of Texas at Austin's Center for Research in Electronic Commerce.

The Internet Economy now directly supports 2.476 million workers, more than the insurance, communications and public utilities industries and twice as many as the airline, chemical and allied products, legal and real estate industries. Some of these jobs were newly created due to the explosion of the Internet, while others reflect companies shifting workers to take advantage of opportunities in the Internet Economy.

In addition, revenue for Internet Economy companies grew at an annual rate of 11 percent from 1998 to 1999, nearly three times the growth rate of the economy as a whole for the same period. (Internet Economy companies include companies that leverage the Internet for business – from pure Internet plays like AOL to companies that use it to increase revenues, such as ToysRUs).

These figures — the Internet Economy Revenues Indicator™ (IERI), the Internet Economy Jobs Indicator™ (IEJI) and the growth rate —are the principal findings of the third report on measuring the Internet Economy commissioned by Cisco Systems.

The growth of Internet-related jobs is startling when considering that the Internet as a business driver is in its infancy and the already low national unemployment rate.

However, the study also found that a labor shortage exists in the Internet Intermediary layer (companies such as online brokerages and portals like Yahoo! that provide services). This labor-intensive layer experienced job growth of just 17 percent over the previous year, the lowest in the study.

Internet Economy Indicators

Annual Employee Figures
Summary by Layer and Total Internet Economy

	1998	1999	Growth
Layer 1 – Infrastructure Indicator	527,037	778,602	48%
Layer 2 – Application Indicator	513,125	681,568	33%
Layer 3 – Intermediary Indicator	290,856	340,673	17%
Layer 4 – Internet Commerce Indicator	577,937	726,735	26%
The Internet Economy (After removing overlap)	1,819,716	2,476,122	36%

The University of Texas study also found the Internet Economy grew to $523.9 billion in 1999 and could grow to $850 billion in 2000 if current growth conditions continue. A snapshot of the 33 largest companies in the study – the bellwether of Internet Economy – indicated revenue growth of 40 percent from Q1 1999 to Q1 2000.

This growth is occurring as Internet Economy companies increasingly rely on the Internet for a larger portion of their revenues: nearly one in 5 dollars of revenues came from the Internet.

Internet Economy Indicators
Annual Revenue and Growth
Summary by Layer and Total Internet Economy
(in millions)

	1998	1999	Growth
Layer 1 – Infrastructure Indicator	$117,143	$197,853	68%
Layer 2 – Application Indicator	$71,615	$101,304	41%
Layer 3 – Intermediary Indicator	$63,629	$96,809	52%
Layer 4 – Internet Commerce Indicator	$99,813	$171,473	72%
The Internet Economy (After removing overlap)	$322,530	$523,923	62%

Revenues and jobs were measured using a four-layer structure developed by the researchers. The component indicators in each level were added, with some adjustment, to make up the larger Revenues Indicator and Jobs Indicator.

While economic activity was strong in all four layers (ranging from 41 percent to 72 percent growth), the research indicates that previous investment in the Internet's foundation is now paying off on the consumer end. E-commerce soared in 1999, increasing 72 percent year-over-year to $171.5 billion. To put that in perspective, the E-commerce portion of the Internet Economy alone tops the banking, aerospace and drug industries' in revenues. Interestingly, the infrastructure layer also showed continued high growth, suggesting online retailers and e-commerce enablers (web portals and brokerages, for example) could be in for more explosive growth.

Revenue growth rates were significant and handily outpaced job expansion - a key indication of the productivity gains generated by the Internet. One measurement - revenue per employee - provides evidence of the productivity gains measured by the government.

Revenue per employee jumped 19 percent from 1998 to 1999, as companies leveraged the Internet to increase operational efficiencies and worker productivity. The growth is evident in all layers, but the most dramatic gains occurred in the service- and goods-based layers. For example, revenue per employee at the E-commerce and Intermediary layers grew 37 percent and 30 percent, respectively.

The vast majority of companies that are leveraging the Internet respond that it increases productivity. In a study, 73 percent of Internet Economy companies said they saw gains in employee and equipment productivity - compared to 29 percent of a sample of all firms.

Also clear is that the Internet Economy phenomenon is far from over. The ultimate goal of this study is to lay the groundwork necessary for understanding the truly incredible impact the Internet is having on the United States as well as the global economy. Our hope is that this study will inspire continued investments in similar or tangential research that helps the world understand how the Internet is reshaping businesses and society as a whole.

Key Findings

- **The Internet Economy Supported an Additional 650,000 Jobs During 1999, a 36 Percent Increase Over 1998.**

The Internet Economy now directly supports 2.476 million workers. To put that in perspective, there are more workers in Internet-related jobs than employees for the Federal Government, excluding Postal workers (1.827 million), communications and public utilities (2.390 million) and insurance (2.405 million) industries. The largest provider of Internet jobs is now in the Infrastructure layer, which supported 778,602 jobs after 48 percent growth from 1998 to 1999.

Internet Economy Indicators
Annual Employee Figures
Summary by Layer and Total Internet Economy

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Layer 1 – Infrastructure Indicator	527,037	778,602	48%
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The Internet Economy (After removing overlap)	1,819,716	2,476,122	36%

- **The Internet Economy now Exceeds Half a Trillion Dollars Annually**

The Internet Economy grew 62 percent last year to $523.9 billion and, if present conditions continue, can be estimated to reach about $850 billion this year. This estimated level of revenue would make it larger than the auto and truck ($728 billion) and life insurance ($724 Billion) industries.

Internet-related revenue growth was 15 times the growth rate for the US economy.

Growth was strong across all layers of the economy with the Infrastructure Layer and the Internet Commerce Layer turning in the strongest performance.

Internet Economy Indicators
Annual Revenue and Growth
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Internet Economy Indicators Quarterly Revenue Summary (in millions)				
	Q1 1999	**Q2 1999***	**Q3 1999***	**Q4 1999**
Layer 1 – Infrastructure Indicator	$37,288	$44,811	$55,896	$59,858
Layer 2 – Application Indicator	$19,923	$22,832	$27,404	$31,145
Layer 3 – Intermediary Indicator	$17,233	$20,762	$30,993	$27,821
Layer 4 – Internet Commerce Indicator	$36,506	$36,292	$46,771	$51,904
The Internet Economy (After removing overlap)	$104,169	$121,600	$141,693	$156,461

*Q2 and Q3 are projections; data was gathered for Q1, Q4, and total 1999 only.

- **A 2000 Snapshot Indicates Continued High Growth for Internet Economy.**

A snapshot of revenue and earnings for the largest companies in the Internet Economy study suggest growth continued at a rapid pace in the first quarter of 2000. Revenue growth was up 40 percent from Q1 1999 to Q1 2000 among the top 30 companies.

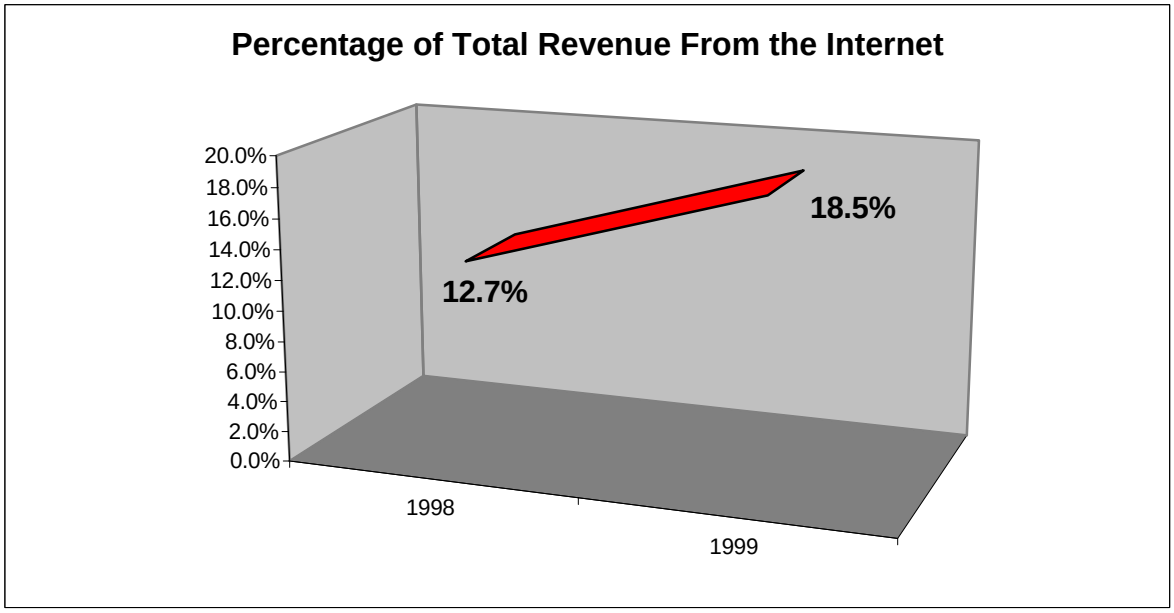
- **Playing in the Internet Economy Accelerates Companies' Growth.**

Total revenues (Internet and non-Internet) at Internet Economy companies grew at nearly three times the rate of the US economy as a whole. 1999 revenues for Internet Economy companies grew 11 percent over 1998, compared to 4.2 percent growth for US gross domestic product for the same time period.

- **Internet Dollars are a Large Piece of the Corporate Revenue Pie**

Internet Economy companies generated almost one of every five dollars in revenue from the Internet. The University of Texas found that 18.5 percent of the companies' revenues were generated from the Web.

Also remarkable is the pace at which Internet revenues are becoming a key segment of a company's base - it's nearly doubled from early 1998 to the end of 1999. In Q1 1998, the portion of revenues derived from the Internet was 10 percent. That jumped to 14 percent in Q1 1999 and to 18.5 percent in Q4 1999.



- **Internet Economy Employees Are VERY Productive.**

Revenue per employee continued to rise as companies leveraged the Internet to increase operational efficiencies and worker productivity. As a whole, revenue per employee jumped 19 percent from year-end 1998 to year-end 1999.

The most dramatic gains occurred in the service- and goods-based layers. For example, revenue per employee at the E-commerce and Intermediary layers grew 37 percent and 30 percent from 1998 to 1999, respectively, suggesting huge productivity gains.

Internet Economy Indicators

Revenue per Employee and Growth Annual Summary by Layer and Total Internet Economy

	1998[1]	1999	Growth
Layer 1 – Infrastructure Indicator	$221,966	$254,174	14%
Layer 2 – Application Indicator	$139,566	$148,628	6%
Layer 3 – Intermediary Indicator	$218,765	$284,143	30%
Layer 4 – Internet Commerce Indicator	$172,706	$235,987	37%
The Internet Economy (After removing overlap)	$177,225	$211,581	19%

[1] **Adjustments to Q1 1999 Estimates:** For both revenue and employees, but especially for employee estimates, there were several factors that led to some adjustments between previous estimates of Q1 1999 and those given in current report. 1) Respondents have gotten better at estimation. Because their Internet-related business is more important to their firm and more visible to them than it was six months ago, they were more likely to be able to provide accurate information. 2) Some companies studied in the fall of 1999 changed status and were added or removed from past estimates based on merger, acquisition, or discovery that primary ownership was outside the US. 3) Some estimates of Internet employees by layer in the previous report were straight line projections linked to percent of revenue from the Internet. Thus, they were not as accurate as the estimates provided in the current study.

- **Internet Economy Companies Report Productivity Increases, Market Share Gains and Competitive Advantages from Leveraging the Web**

  The vast majority of Internet Economy companies that are leveraging the Internet respond that it enables them to expand growth and get a leg up against competitors. For example, 68 percent of Internet Economy companies report experiencing a gain in market share attributable to the Internet - in contrast to only 24 percent of companies samples from the economy as a whole.

Percent of Respondents who said "Yes"	Internet Economy Companies	Sample from US as a Whole
Have any of your Internet-based products or services created any significant business or competitive advantages for your company?	87%	44%
Have you seen any gains in employee or equipment productivity?	73%	29%
Have you seen any increases in your market share that you would attribute to your Internet-based products or services?	68%	24%
Have you been able to increase your penetration of a new market as a result of implementing your Internet-based products or services?	72%	25%

- **Laying the Internet's Foundation is Paying Off for E-Tailers.**

The hundreds of billions of dollars spent on the Internet infrastructure is now paying huge dividends to companies that provide goods and services over the Web. E-commerce exploded in 1999, growing at a 72 percent year-over-year rate to $171.5 billion.

In addition, both the E-commerce and Intermediary layers saw substantial increases in revenue per employee as a result of the infrastructure "dividend." Revenue per employee at the E-commerce and Intermediary layers grew 37 percent and 30 percent, respectively, suggesting huge productivity gains.

Overview – The Big Picture

The Internet Economy has grown more rapidly than anyone could have envisioned even five years ago, opening up new vistas of communication, collaboration and coordination between consumers, businesses and trading partners. What started out as an alternative marketing channel has quickly turned into a complete economic system consisting of (i) ubiquitous, low cost communication networks using Internet technologies and standards, (ii) applications and human capital that enable business to be conducted over this network infrastructure, (iii) interconnected electronic markets that operate over the network and applications infrastructure, (iii) producers and intermediaries providing a variety of digital products and services to facilitate market efficiency and liquidity, and (iv) emerging policy and legal frameworks for conducting business over the Internet.

Bigger than the Industrial Revolution

Starting around 1994, the Internet Economy has grown much faster pace than the Industrial Revolution that began in the 18th century. Perhaps more importantly, the potential scope, size and overall economic impact of this economic system is much larger than what we can comprehend today. The key characteristics that distinguish the new economy are information, knowledge and speed. In the traditional economy, companies rely on physical assets to create value, and have often owned the value chain to minimize the risk of relying on others. In the Internet Economy, smart companies are relinquishing ownership of most of the value chain activities. Instead they are relying on real-time information and customer knowledge, and leveraging Internet based partnerships with suppliers and contract manufacturers to do business in the most productive and efficient manner. The secrets of success involve “advantaged relationships” with trading partners, knowing and fulfilling customer needs, anticipating future requirements, using online customer knowledge to create new products and services, designing pricing and promotion schemes that match customers’ willingness to pay, and building network-based alliances and partnerships.

The Growth of the Internet Economy

The growth of the Internet Economy is important not only for analyzing what new business opportunities and models are created by the Internet, but also for understanding what corresponding transformation we are likely to witness in the physical economy. One of the most important aspects of any economy is its growth rate. This relates to the total output produced within the economy. It should be evident that a large part of the growth in the emerging Internet Economy will come at the expense of the physical economy through a substitution effect. However, the convenience, flexibility and efficiency gained by doing business through the Internet are remarkable, which should ultimately be reflected in the value added in the new economy. Further, there is much anecdotal evidence that new demand is being created by the Internet. For instance, dynamic pricing is being used to match supply and demand (as in the case of airlines and hotels); buyers and sellers now have direct or electronically intermediated access to each other across the globe, which often results in transactions that would not have occurred otherwise.

What should we measure?

Even though it is customary to measure Electronic Commerce in terms of the dollar volume of online transactions, it is important to consider the business impact of the Internet in a more comprehensive manner, as a complete economy with characteristics such as inputs, outputs, size, value-added, efficiency and productivity. In addition to measuring the volume of economic activity on the Internet, it is also critical to ask the following questions: How good is this new economy? What the characteristics of players who add the most value in this new world?

It is imperative that we have a solid conceptual foundation to define various components of this new economy, enumerate the universe of players within each component, measure and track the growth of various components over time, analyze the efficiency and productivity of converting input resources into outputs, and tie in the results with policy implications. In two previous studies released on June 10, 1999, and October 26, 1999, we presented a model of the “Internet Economy Indicators” along with 1998 and Q1 1999 size estimates.

This report provides size estimates for 1999, and also includes some interesting findings about the productivity of pure Internet-based companies. These new results highlight the basis of value creation in the Internet Economy, and have deep implications for how companies should go about transforming their business models, strategies and processes. Welcome to the third wave of the Internet Economy Indicators research.

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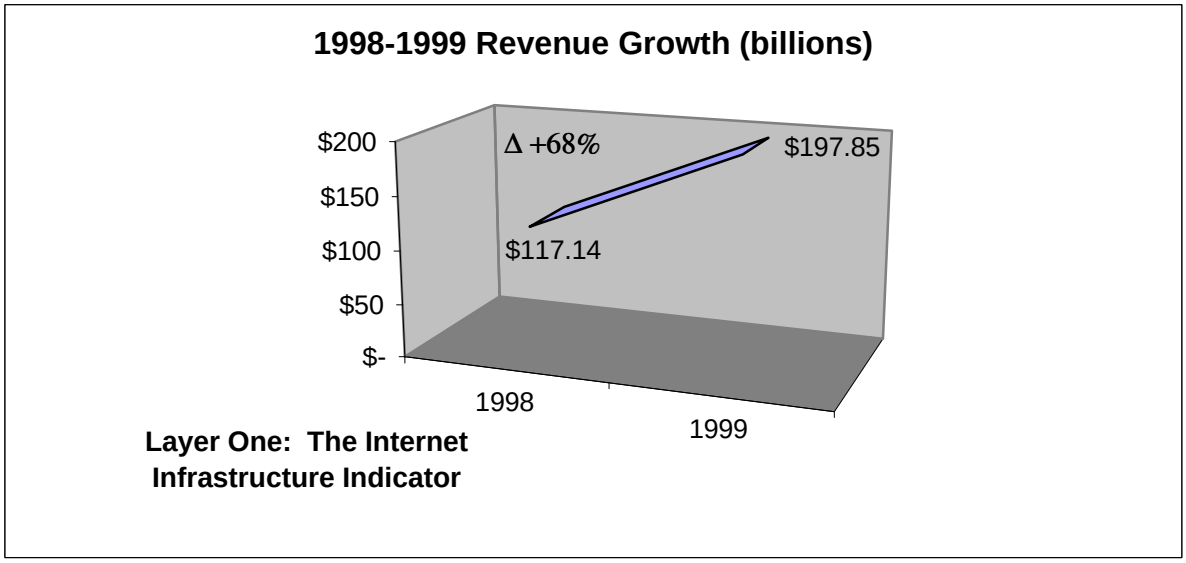
The Internet Economy Indicators

Due to the complexity and inter-relatedness of the companies that contribute to the Internet Economy, a classification system was developed to allow for associated revenues and employees that belong to distinct segments. The most logical approach for this classification system was to break apart the Internet Economy into layers based upon the unique elements necessary to facilitate the ultimate revenue producer on the Internet, sales transactions. A more detailed description of how we defined and measured the Internet Economy is included in Appendix A.

Layer One – The Internet Infrastructure Indicator

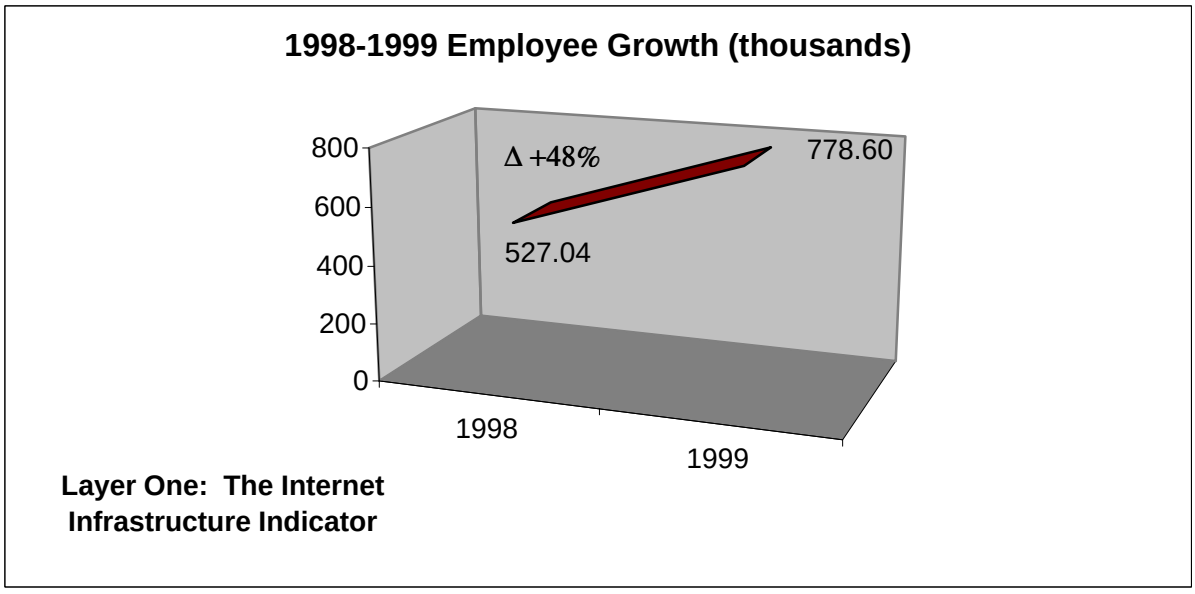
The Internet Infrastructure layer consists of the telecommunications companies, Internet Service Providers, Internet backbone carriers, "last mile" access companies and manufacturers of end-user networking equipment all of which is a prerequisite for the Web and the proliferation of Internet based electronic commerce.

- The Internet Infrastructure Layer generated over $197 billion in revenue in 1999, an increase of 68 percent over 1998. In 1999 Infrastructure became the second fastest-growing layer of the Internet Economy, surpassing the Application and Intermediary Layers.



Source: The Center for Research in Electronic Commerce, Graduate School of Business, University of Texas at Austin Ó 2000

- Internet-related employment in the Infrastructure Layer grew 68 percent from 1998 to 1999 to 778,602.



Source: The Center for Research in Electronic Commerce, Graduate School of Business, University of Texas at Austin Ó 2000

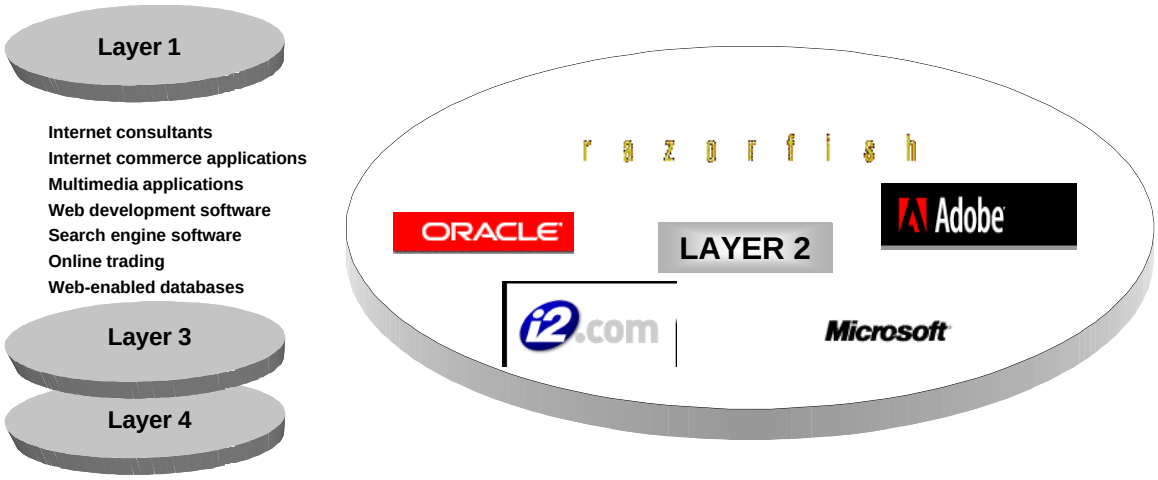
- Internet Infrastructure companies showed more consolidation than other layers of the Internet Economy, with the top ten companies contributing 52 percent of Layer revenues.
- The Internet Infrastructure has become a huge industry in itself– almost $200 billion in 1999 (larger than the drug, banking and aerospace industries).
- Infrastructure is labor and capital intensive, but provides the backbone of the Internet Economy that can be leveraged for growth by smaller companies in the

other layers. Still, revenue per employee was a healthy $254,174 – representing 14 percent growth from 1998 to 1999.

- Some of the largest Internet Infrastructure companies are participating in multiple layers of the Internet Economy, either generating significant E-commerce revenues or providing layer two products or services.

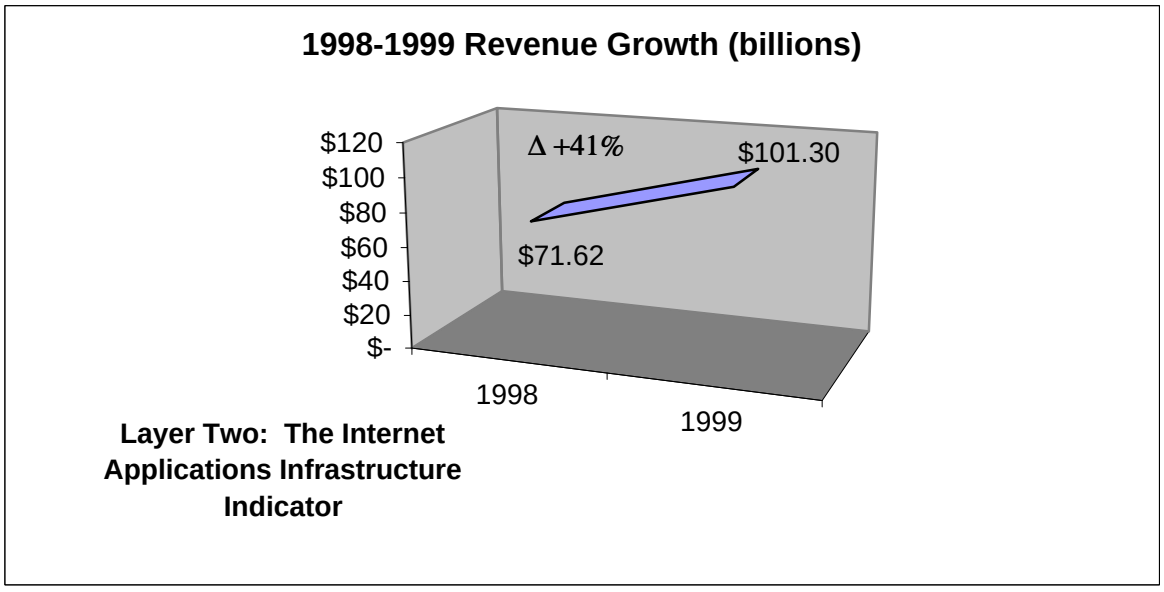
Layer Two – The Internet Applications Infrastructure Indicator

The Internet Applications Infrastructure involves software products and services necessary to facilitate Web transactions and transaction intermediaries. In addition to the software products that help facilitate Web transactions, this layer of the Internet Economy includes the consultants and service companies that design, build and maintain all types of Web sites, from portals to full E-commerce sites.



As the Internet Economy continues to grow and network infrastructure continues to provide increased bandwidth, we expect to see continued strong growth in the development of applications such as video and audio streaming technologies and other Web-based applications. In 1999, public attention has been drawn to the Internet's effect in broadening audiences for traditional radio media, who can now overcome geographical and signal strength limitations by broadcasting over the Internet.

- The Internet Applications Infrastructure layer grew 41 percent year-over-year in 1999, generating just over $101 billion.

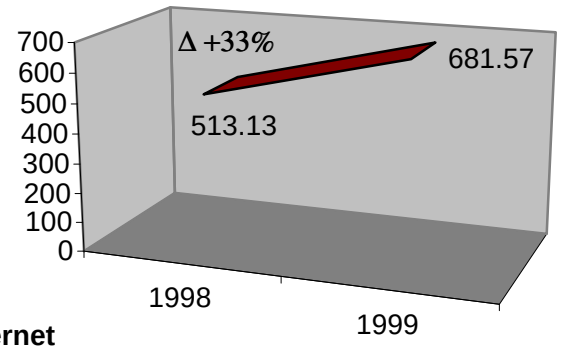


Layer Two: The Internet Applications Infrastructure Indicator

Source: The Center for Research in Electronic Commerce, Graduate School of Business, University of Texas at Austin Ó 2000

- During 1999, Internet-related employees in the Applications Infrastructure layer grew 33 percent year-over-year to 681,568.

1998-1999 Employee Growth (thousands)



Layer Two: The Internet Applications Infrastructure Indicator

Source: The Center for Research in Electronic Commerce, Graduate School of Business, University of Texas at Austin Ó 2000

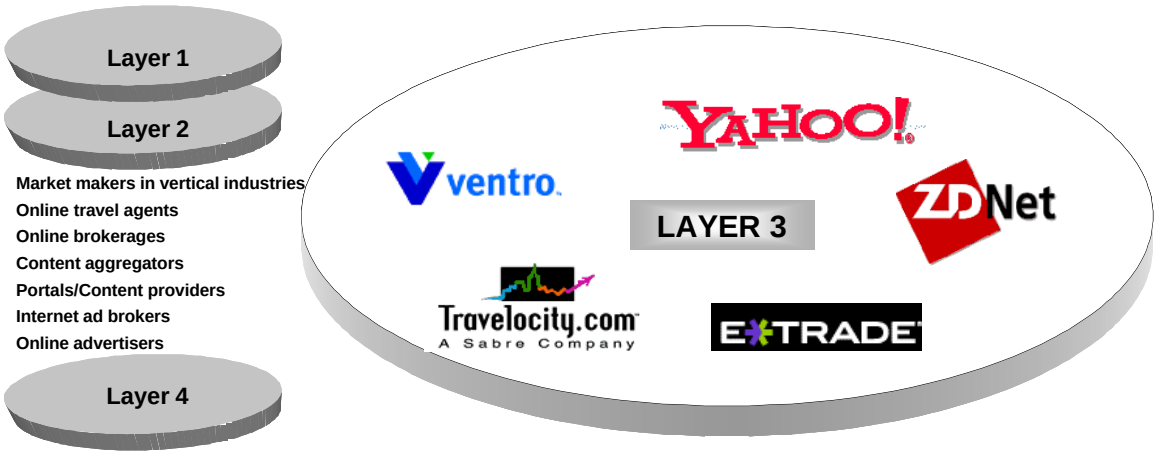
- Applications and consulting are human-capital intensive businesses. While Applications revenues are similar to those in the Intermediary Layer, there are roughly double the number of employees, resulting in the lowest revenue-per-employee of all layers – $148,628 in 1999.
- The Applications Infrastructure Layer takes second place for the level of consolidation, with 43 percent of revenues concentrated in the top ten companies.
- There is some indication that a lack of qualified workers may have created a bottleneck in Layer Two during 1999. With individual workers involved in Y2K initiatives freed up and corporate focus moving away from Y2K compliance to more strategic initiatives, it would not be surprising to see significant growth in this layer over the course of 2000. At the same time, a Cutter Consortium survey conducted during the first quarter of 2000 indicated that 70 percent of companies did not have sufficient software developers capable of developing the distributed, component-based systems that form the foundation of e-commerce.[2]

[2] Cutter Consortium Research Briefs, "Finding Developers for E-Commerce Projects", May 23, 2000.

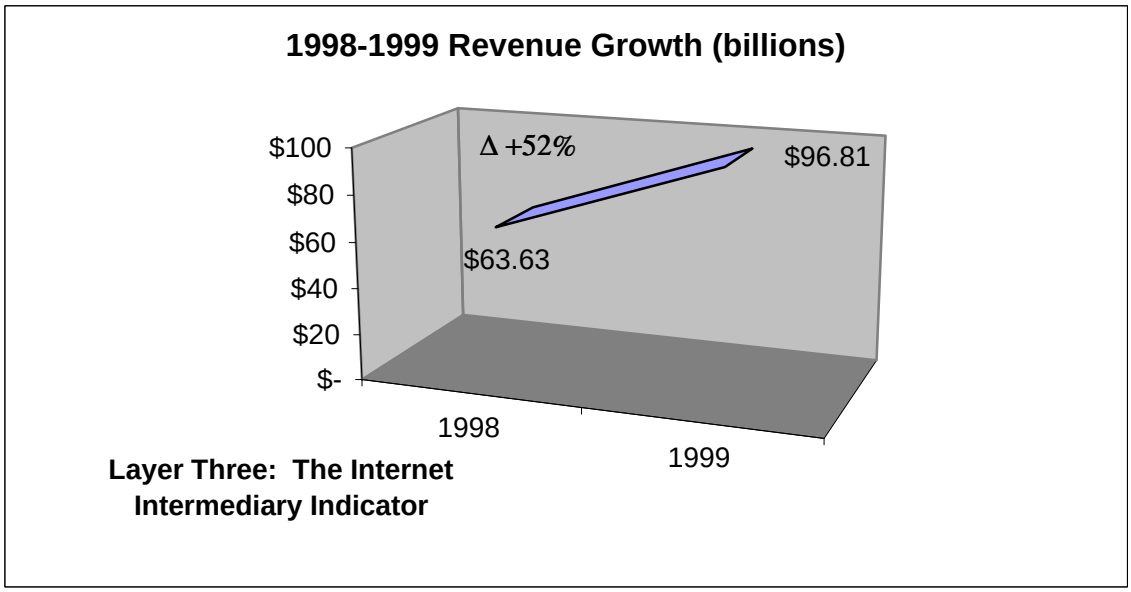
Layer Three – The Internet Intermediary Indicator

When looking at businesses conducting transactions on the Web, it was recognized that there was a class of business that did not generate transaction-related revenues in the same way as companies in the Internet Commerce layer (layer four). Therefore, it was determined that a classification layer would be added for these types of companies and that layer is called the Internet Intermediary Indicator.

There is a distinct type of company that operates in layer three, one that is predominantly an Internet pure-play. While not directly generating revenues from transactions, their Web-based business generates revenues through advertising, membership subscription fees, and commissions. Many of the layer three companies are purely Web content providers while others are market makers or market intermediaries. This is an important group of companies that is likely to have a significant impact over time on the efficiency and performance of electronic markets.

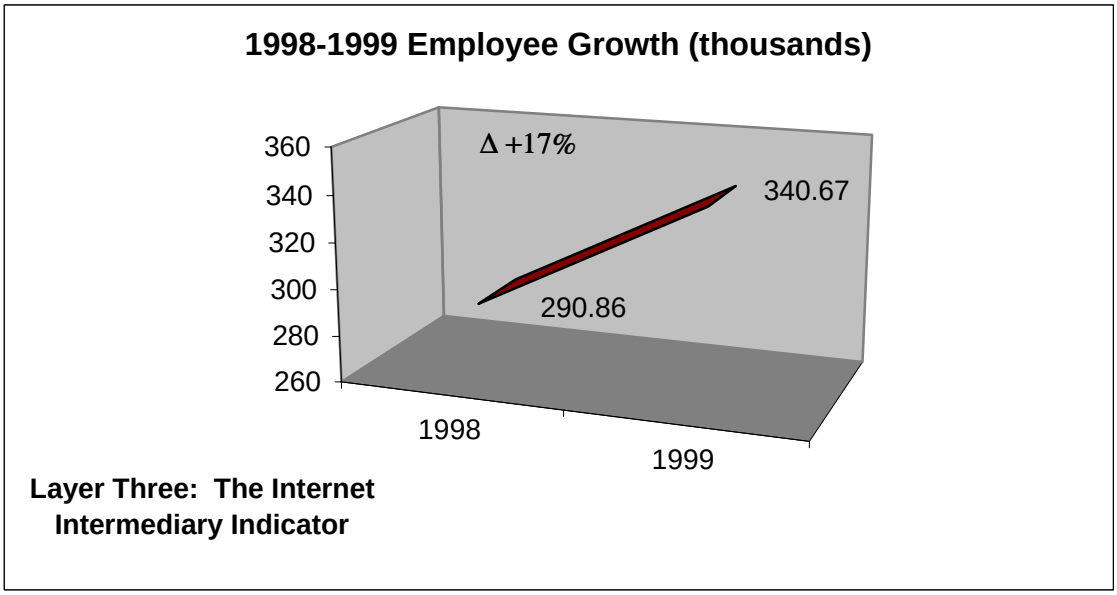


- Revenues for Internet Intermediaries increased 52 percent year-over-year in 1999 to $96.81 billion.



Source: The Center for Research in Electronic Commerce, Graduate School of Business, University of Texas at Austin Ó 2000

- Internet Intermediary companies realized a 17 percent growth rate in Internet-related employees. Employees for this layer totaled 340.6 for 1999.



Source: The Center for Research in Electronic Commerce, Graduate School of Business, University of Texas at Austin Ó 2000

- The Intermediary Layer is the smallest layer with the least consolidation in the Internet Economy. The top ten companies contribute only 23 percent of the revenues to this sector.
- Intermediary companies 17 percent job growth rate was the lowest in this wave of the study. However, revenue per employee grew 30 percent to $284,143 – the highest of any layer.

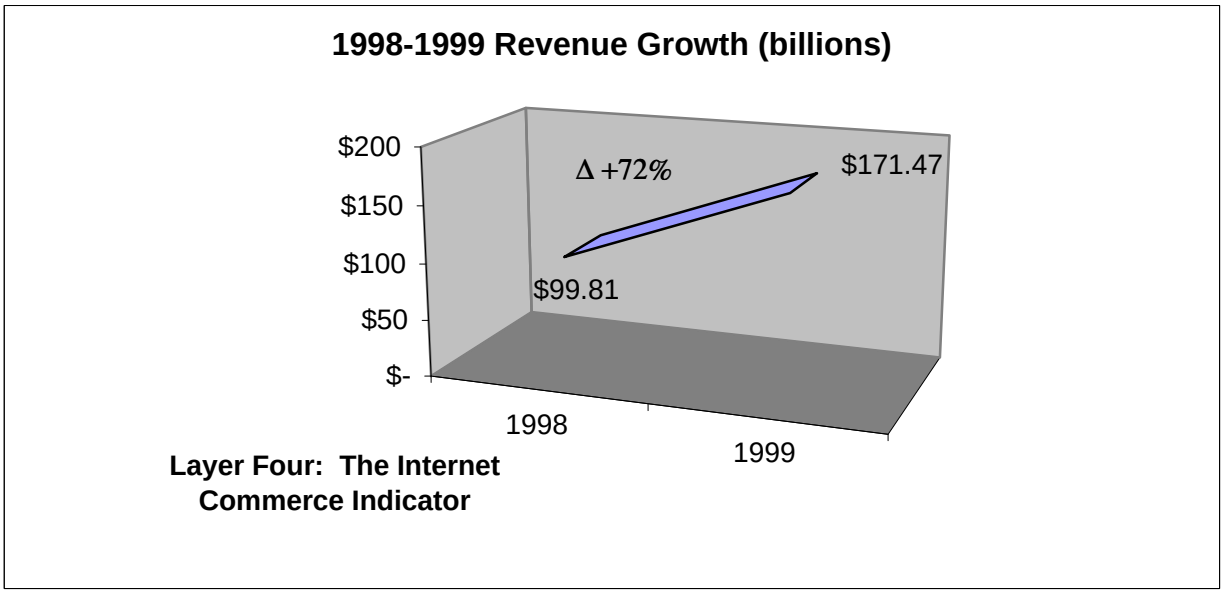
- A number of factors can explain the apparent slowdown in the Intermediary layer. First, this layer is still in the process of being defined as a category. The click-through advertising revenue model is coming under fire and a clear replacement has not yet emerged. Market-making intermediaries can only grow relative to the volume of on-line procurement and are still in the investment phase of testing their business model. Second, the Intermediaries have seen a number of events that contribute to uncertainty about the future, including last year's Denial of Service attacks, several widely distributed media profiles raising consumer concerns about security and on-line privacy, and legal challenges to the business models of sites such as Napster and MP3 (intermediaries that allow trading of music files online) for allegedly facilitating copyright violations. There is tremendous potential for growth in the Intermediary layer of the Internet Economy, but it is the layer most likely to contain the most surprises in the future since many intermediary businesses are still trying to demonstrate their value.

Layer Four – The Internet Commerce Indicator

The companies that are included in layer four are only those companies that are conducting web-based commerce transactions. While many other studies of e-commerce have included intermediary-type companies such as VerticalNet or E-Bay, we included those companies in layer three.

The companies that we have included in layer four cross a wide variety of vertical industries. In addition, the commerce layer contains quite a few 'mom and pop' shops generating a respectable revenue stream.

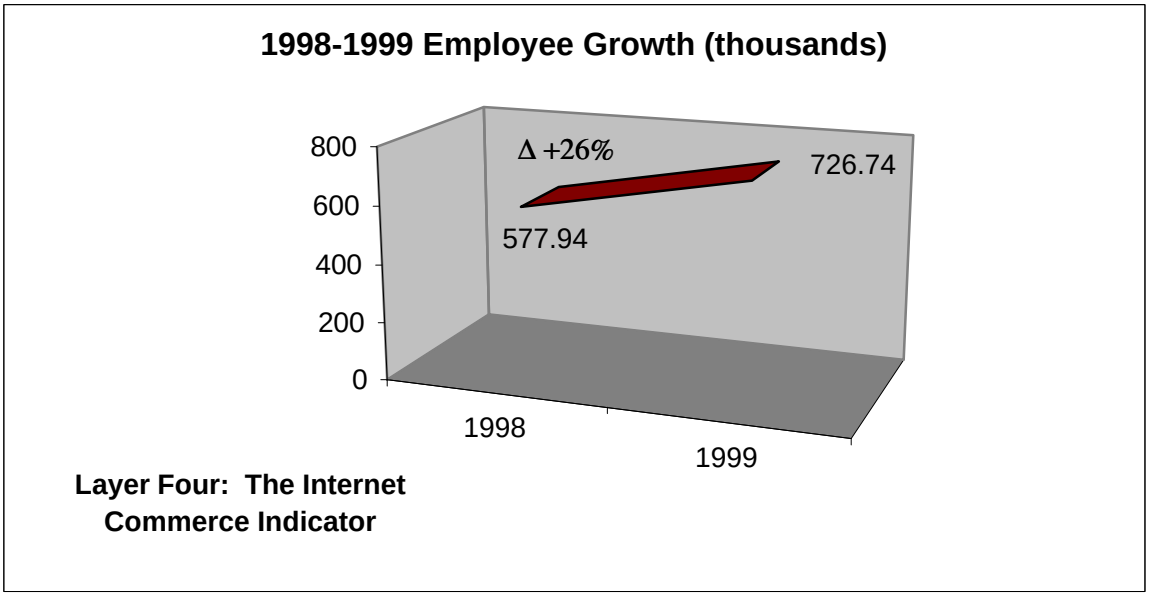
- E-commerce remained the fastest-growing layer of the Internet Economy, turning in a 72 percent increase year-over-year in 1999, generating over $171 billion in revenues.



Source: The Center for Research in Electronic Commerce, Graduate School of Business, University of Texas at Austin Ó 2000

- The pace of employee growth slowed to 26 percent in1999, but the E-commerce layer still employs the second largest number of employees at just over 726,000.

- Slower employment growth had a positive effect on revenue per employee, which shot up 37 percent to $253,987 in 1999 – the fastest growth of any layer. Clearly, earlier investments in infrastructure and human resources have begun to pay off.



Source: The Center for Research in Electronic Commerce, Graduate School of Business, University of Texas at Austin Ó 2000

- The Internet Commerce Indicator is still the second largest layer of the Internet Economy and has seen a significant increase in the proportion of business-to-business E-Commerce over the course of 1999. With 35 percent of the revenues generated by the top ten companies, the population of companies in the E-commerce world parallels that of the broader retail market in terms of company size, proportion of revenue and employment.

Faces of the Internet Economy

Layer One: Infrastructure Indicator

Covad Communications
Richard Wong
vice president of marketing
www.covad.com

The Wait is Over…

Everyone knows the frustration of waiting for a Web site to load. Graphics-heavy sites require a great deal of patience and, even when the download is complete, videos often appear as a series of distorted images. New developments in the Internet industry may put an end to these frustrations and open a world of new opportunities. Through the installation of high-speed digitized or "broadband" networks across the country, people will be able to experience the Internet in a richer and more interactive way than ever before. As broadband penetration increases, Santa Clara, CA-based Covad Communications is positioned to set the standard for Internet access.

“This is the beginning of the next Internet wave,” stated Richard Wong, vice president of marketing, Covad Communications. “The Internet is shifting to broadband, providing users with a true multi-media experience.” Founded in 1996, Covad is providing the U.S. with a new broadband Internet connection called DSL (Digital Subscriber Line). DSL provides users with Internet access at speeds up to 1.5 MB per second, nearly 50 times faster than the traditional dial-up connection. With expected coverage of 50 percent of the United States by the end of this year, Covad is the first DSL provider to focus on building a nationwide broadband network.

Taking advantage of traditional copper phone lines, DSL provides every user with an individual line, connected to the Internet 24 hours a day, 7 days a week. The result is a non-shared connection allowing people to experience the full potential of the Internet. “DSL puts the wire on steroids by digitizing it,” explained Wong. “When I ask people if they would ever go back to dialup, the unanimous response is ‘absolutely not.’ People are passionate about the fact that broadband offers a substantially richer Internet experience.”

Covad’s growth has been staggering in the last three years, surging from 4000 subscribers in 1998 to more than 100,000 in the first quarter of 2000. Analysts expect Covad to have approximately 300,000 customers by the end of the year 2000. Revenues have also risen sharply, with sales growing 1154% in the last year. And still, only a very small percentage of Internet users have a high-speed connection. “This is only the tip of the iceberg for high-speed Internet access,” stated Wong. “Every major media or application company is now considering how they can move their business to a broadband world.”

Wong believes the Internet is creating new opportunities for everyone by allowing people from all layers of society to succeed in today's business world. "The great thing about the Internet is that it's a place where ideas win," said Wong. "The Internet is creating huge opportunities today for people who have genuinely new ideas, ideas that will reduce costs for consumers and truly improve people's lives. None of this would have been possible fifteen years ago."

With the broadband connection always on, the use of the Internet as a true "appliance" is becoming a reality. Covad believes the always-online aspect will fundamentally change people's communication behavior. "It is amazing how the Internet has already changed the way people communicate and do business," explained Wong. "First we used hard copies, faxes and telephones. Now, no one could imagine not using the Internet for these purposes. With the convenience of DSL, the use of the Internet will become even more widespread."

In the next few years, broadband will revolutionize the Internet, as a new wave of high-speed Internet users will create an entire new set of opportunities for all Internet companies. "Application providers, intermediaries and advertising companies will all benefit from broadband," explained Wong. "As broadband becomes ubiquitous, Covad will be partnering with companies in all layers of the Internet economy. Soon the idea of life without a high-speed Internet connection will be as foreign as the idea of life without a telephone."

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Trivnet
Moti Dolgin
president and chief executive officer
www.trivnet.com

It's Easy as I-S-P

You're trying to buy a CD on the Internet when suddenly a window pops up, asking you for personal information from credit card number to marital status. At that point, you change your mind and decide to just walk down to the store. After all, who doesn't worry about hackers, credit card fraud or giving out your private information on the Internet? And what about filling out lengthy forms simply to purchase one CD? Instead of losing these customers, merchants can now close the deal with Trivnet.

Using Trivnet's payment solution, consumers no longer have to register, download software or enter credit card information on the Net. "Trivnet allows people to buy products instantly without having to go through all of the formalities," explained Moti Dolgin, president and chief executive officer, Trivnet. "The Internet economy needs this type of infrastructure to make online shopping more suitable for consumers. Trivnet offers the opportunity to conclude transactions as quickly and securely as possible."

Founded in 1997, Trivnet recently patented their newly developed solution to automatically

identify and bill Internet users through the connection with the individual's Internet Service Provider (ISP). "Your connection provides your ID," stated Dolgin. "The only thing the customer has to do is point and click. The individual is immediately identified, his or her credit is checked and the customer receives an approval window." All personal information will be retained only by the ISP, making it virtually impossible for hackers to obtain private or credit card information over the Internet.

Buying a CD online will soon be as easy as making a phone call; you won't have to do anything but enter your destination. At the end of the month the charges will automatically be included in your usual ISP bill. "In order for e-commerce to reach its full potential, purchasing has to be this secure and convenient," stated Dolgin. "E-commerce must conform to consumers' normal buying patterns to become part of daily life."

As a global company, Trivnet provides a great example of how the Internet economy is affecting people's lives around the world. Though the company is now headquartered in New York City, Trivnet was originally formed in Israel. Known for its early adoption of new technologies, Israel is rapidly becoming a center for high-tech development and the Internet. "The Internet economy is no longer limited to North America or Europe, it is a global phenomenon," explained Dolgin. "From schools and corporations to people's private lives, the Internet is becoming a standard everywhere."

Focused on micro-transactions, including the purchase of digital content such as information, music and software, Trivnet has a promising future. Over the next three years, Jupiter Communications projects micro-payments to become 80 percent of all e-commerce transactions, accounting for almost 25 percent of the dollar volume of all Internet purchases. "There are certainly opportunities for tremendous growth," said Dolgin. "The vast majority of consumers still cite credit card security concerns as the main reason for never having shopped online. Trivnet will change that rapidly."

Merchants have responded to Trivnet's new payment system enthusiastically, as transaction completion rates with Trivnet have been 300 percent higher than standard online credit-card transactions. The relationship is beneficial for all parties involved, since ISPs receive a commission on every transaction made by customers. As a result, major ISPs from around the world, including Japan, Singapore, Israel and the USA, are already signing up for Trivnet's services.

As the Internet continues to grow and impact economies all over the world, Trivnet is well positioned to provide the most simple and secure payment system available. Online shopping will soon become safe and easy, so that purchasing a CD is as simple as phoning a friend. "With the proliferation of Internet usage, security is our number one issue," said Dolgin. "However, we should never underestimate the importance of convenience."

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Layer Two: Application Indicator

Audible, Inc.
Foy Sperring
vice president of marketing
www.audible.com

Now Hear This

It's 7:23 in the morning; you're four miles from home, more than 40 miles from work, and already stuck in bumper to bumper traffic. As you flip the radio dial from commercial to commercial, you realize another two hours of your time will inevitably be wasted on the road. Wouldn't it be great if you could create your own customized programming that was both informative and entertaining?

"We're leveraging the Internet to revolutionize our industry and turn a whole new generation of people onto the benefits of audio," explained Foy Sperring, vice president of marketing, Audible, Inc. Sperring is typical of the 84 million people who drive alone to work each morning. He commutes 149 miles round trip each day from his home in Long Island, New York to Audible's headquarters in Wayne, New Jersey and considers Audible to be an essential part of the drive. "Audible makes better use of your time by providing premium content that is both enriching and educational," said Sperring. "The Internet provides you with the opportunity to access a whole library of new information."

Since 1995, Audible has been providing consumers with the ability to listen to spoken word anywhere, at anytime. In addition to providing the necessary technology solutions, Audible offers a large selection of premium content on its Web site. On Audible.com, customers can download content to their computers or portable devices and create a playlist of multiple programs for up to 28 hours. "Audible's service is unique in that, once you purchase a product, it is delivered instantaneously and ready for use," Sperring explained. "The Internet provides Audible with the ability to fulfill product orders instantly, without warehousing, inventory, or shipping costs. This model gives Audible an incredible margin play unavailable to traditional businesses." Audible, in turn, is able to pass its savings along to the customer.

So far, Audible's business model has proven enormously successful. The company's revenue growth rate increased 363 percent in 1999, accounting for a total of $1.74 million in sales for the year. With the Q1 2000 revenue figures up an additional 60 percent from the end of 1999, it is clear that the popularity of digital audio is on the rise. Forrester Research predicts that more than 20 million digital audio players will be purchased by the year 2003, all compatible with spoken-word audio downloaded from Audible.com. Even industry giants like Amazon.com have taken notice of this space. Amazon recently took a five percent stake in the company knowing that, as devices proliferate and sales continue to soar, so will brand awareness and revenues for Audible.

Audible's business is primarily aimed at the ever-increasing number of individuals who

commute and/or exercise on a daily basis, consumers seeking enrichment when their eyes are busy but their minds are free. The company currently offers more than 25,000 hours of commercial-free audio online, ranging from a daily version of the *San Jose Mercury News* to a series of historical speeches delivered by Winston Churchill. Audible's latest technology allows you to actually automate the download process. "If you have an audio subscription to the *Wall Street Journal*, it can be automatically delivered to you at the same time every morning," explained Sperring. "Audible's application actually wakes up your computer, connects it to the Web, downloads the copy and disconnects."

Audible is defining a new trend in digital media. A small town business that already has a worldwide presence, Audible plans on becoming a notable contributor to the nation's economy -- an economy that has been, and will continue to be, spurred by e-commerce. Spoken word is just the beginning in the wide variety of media we will see available for download in the future and Sperring looks forward to establishing Audible's place in this new economy. "The Internet represents a revolutionary transformation as significant as the railroad was 150 years ago," concluded Sperring. "It knocked down the physical boundaries to open trade and communication."

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eCode.com
Rohit Chandra
president and chief executive officer
www.ecode.com

Don’t Lose Your Identity

Moving at Internet speed, Sunnyvale, CA-based eCode.com, is a leader in the burgeoning Internet identity space, providing users with web-based business cards that are accessible from around the world. Since being featured seven months ago in the October 1999 Measuring the Internet Economy study, the company has tripled its product offerings, doubled its employee base, and established over 150 strategic partnerships.

eCode.com’s birth, growth and success is a direct result of the power of the Internet economy. “The Internet is truly the new medium,” explained Rohit Chandra, president and chief executive officer, eCode.com. “The computer was just a new device, and it pales compared to a new medium. I compare the Internet Economy to the Gold Rush; it is making everyone move rapidly to define and develop a niche in the new medium.”

eCode.com’s niche was defined in 1997 by Chandra, who recognized the need for a single repository of contact information on the Internet that would always be up to date and readily available through any Web browser. “Everyone on the planet is asking you for the same information – the doctor’s office, financial institutions, insurance and utility companies, government agencies,” said Chandra. “We are leveraging the Internet to encapsulate all your information in one place and (if authorized) make it easily and

universally accessible. Why spend hours filling out forms when you can just give someone your eCode?"

The company's new flagship product, the iBAR™, attaches to any Web browser and immediately establishes your online identity. "The iBAR™ contains your complete computing identity and environment – your personal and professional profiles, address book, photos, files, calendar, and bookmarks," said Chandra. "With the iBAR™ it takes one-click to automatically fill out order and registration forms, logon to password-protected Web sites, make e-commerce purchases, and much more."

The release of such innovative products as the iBAR™ marks eCode.com's transition into the business-to-business (B2B) space. "Six months ago we were primarily a business-to-consumer (B2C) company focused on Web cards (electronic business cards) and hosted address books," said Chandra. "Today, we are predominantly a business-to-business (B2B) company offering innovative tools that help our business partners reach, register, and repeat their customers."

The move to the B2B space has opened up many new revenue models for eCode.com. The company now generates revenue from offering branded versions of the iBAR™ to Internet powerhouses such as Alta Vista, Amazon.com, and About.com. "We not only generate revenues from the branding, but also receive click-through or transaction fees, or revenue sharing fees every time someone clicks to one of our partners through the iBAR™," explained Chandra.

First B2C, now B2B, what's next for eCode.com? Moving forward, eCode.com plans to aggressively expand its partnerships, membership base, revenues, and visibility. Furthermore, the company has its eyes set on the enormous business-to-government (B2G) sector. "There are thousands of government agencies forever mishandling information on individuals. Think of the millions of redundant government forms, not to mention the data collection issues of Census 2000. Billions of taxpayers dollars could be saved in the future with the wide acceptance and use of eCodes," said Chandra. "I believe there is no bigger opportunity on the planet today. Our challenge is to execute well on this opportunity."

(See "Managing your Internet Identities" from October 1999 Report for original case study)
For additional information on eCode.com, contact: Terry Anderson at (408) 845-9400 x118 (or) terry@ecode.com

eCollege.com
Rob Helmick
co-founder and co-chairman of the board
www.ecollege.com

Higher Webucation

Every week professors across the country show up for lectures in empty classrooms. The professors keep teaching. And their students are still learning. They're on the Web. Thanks to the Internet, hundreds of thousands of students are now taking classes and earning degrees through Internet-based distance learning programs. One of the companies driving this innovation in higher education is Denver, Colorado-based, eCollege.com.

"It has always been my goal to bring the world together through higher education," said Rob Helmick, co-founder and co-chairman of the board, eCollege.com. "The Internet provided the perfect vehicle to attain this goal." Inspired by the growing popularity of America Online in 1995, Helmick quickly recognized the Internet's potential for improving higher education. Helmick had spent the past 13 years as a consultant to universities and saw limitless possibilities for the Internet to not only reach more students through distance learning, but also enhance on-campus education through interactive and multi-media resources.

eCollege.com now allows universities to offer online courses complete with video lectures, interactive discussion rooms, collaborative document building, and secure test taking. The company provides all the necessary software, and hosts the application on their own servers, leasing the whole program to universities on a per course/per student basis. In this manner, universities can avoid significant capital investments and focus on higher education, not high-tech maintenance. Today, this is commonly known as an application service provider (ASP) model.

In the fall of 1996, the University of Colorado was the first university to utilize eCollege.com's Web technology. Since then, the company has experienced tremendous growth due to the success of online learning programs coupled with the mass penetration of the Internet. The company surpassed its lofty goal of securing 30 online programs by this year and is working with over 190 universities including the University of Virginia, University of Pennsylvania, and Seton Hall University. "We had no clue that the Internet was going to be so huge," said Helmick. "Even more amazing is that we have just begun to experience the Web's influence on higher education."

International Data Corporation (IDC) estimates that the number of college students enrolled in distance learning courses will reach 2.2 million by the year 2002, up from 710,000 students in 1998. eCollege.com reported $4.7 million in revenues for 1999 (178 percent increase from 1998) and Prudential Securities expects revenues to hit $14.7

million for 2000 and $38.9 million in 2001. “The Internet has presented us an enormous opportunity,” said Helmick. “There are over 4000 universities and 15 million students in the United States alone, not to mention continuing education, corporate training, and test preparation. The upside potential of this industry is incredible.”

However, for Helmick and eCollege.com, impressive market projections and revenues pale in comparison to the number of people whose lives are positively affected by the company’s use of technology. “The Internet is offering enormous opportunities that were previously unavailable to thousands of people,” said Helmick. “Many students taking classes online couldn’t attend traditional programs for whatever reason. These students are now getting degrees and improving their lives with better jobs, higher pay, and increased self-esteem. I get so many ecstatic emails from recent parents who previously would have dropped out of school or not applied because they had to work full-time or attend to children.” According to Helmick, 65 percent of online students in eCollege.com’s hosted classes are women between the ages of 23 and 53 years old who work at least 30 hours a week.

Although eCollege.com is leading with online classes, Helmick stresses that the company is a total solutions provider whose goal is to “Webify” every aspect of higher education. “A university is a lot more than teaching,” explained Helmick. “It is the application and registration process, putting out course catalogs, academic advising, maintaining a library and much more. We have already Webified these transactions for many of our customers.” Michael Moe, Director of global research at Merrill Lynch, estimates this market for electronic education tools will reach $5.5 billion by the year 2002, a yearly growth rate of 95 percent.

There are currently over 60 universities offering complete degrees over the Web. Degree offerings range from B.A.s to Ph.D.s and a growing number of international students are taking advantage of these programs. According to Helmick, the Internet will be a great benefactor to American universities. “United States higher education is universally considered the best in the world,” said Helmick. “The power of the Internet is the power to deliver our higher education without physical boundaries to all corners of the world.”

For additional information on eCollege.com, contact: Grace Hu at 303-632-1640 (or) graceh@ecollege.com

Layer Three: Intermediary Indicator

eBallot.net
John Brown
chief executive officer
www.eballot.net

Click the Vote!

The Internet has revolutionized almost every facet of life, and now it is poised to reshape politics in the 21st Century. The digital age has produced tools that can alter how citizens and government interact through the creation of an Internet Democracy.

If democracy is about promoting freedom and empowering people; then technology can be an important tool of equal opportunity, because of its potential to lower barriers and increase results. At the same time, many challenges await.

"The Internet provides the opportunity for people from all walks of life to participate in the democratic process," explained John Brown, chief executive officer, eBallot.net. "Our goal is to empower people to vote from anywhere they have access to a Web browser." Since 1998, eBallot.net has been working endlessly to develop a comprehensive Internet-based elections management system, offering secure solutions to run not only binding government elections, but also union and corporate shareholder proxy elections. With the aid of eBallot.net, voters are able to cast ballots from anywhere with an Internet connection, be it a public polling station, Internet cafe, or the privacy of their own home.

Although multi-party elections have yet to take place online, the elections industry represents a multi-billion dollar market opportunity. The US Census Bureau and the FEC estimate that the combined market for the 3,000 counties in the United States represents an opportunity worth nearly $2 billion. In addition, the union voting market stands at $203 million. Although eBallot.net is limiting its activities to the U.S. at present, the international market offers a huge opportunity for the future. The cost for conducting an election outside the U.S. ranges from $4 to $6 per voter in developed nations to more than $10 in less developed countries (ACE Project). "There's real value for eBallot in the international market, especially in third world communities," said Brown. "The Internet allows us to provide an election system that is inherently more secure than many of their existing processes."

Bringing the voting process into the Internet age provides benefits for everyone involved. Online elections serve as a fantastic convenience mechanism for the many senior citizens that may otherwise have difficulty getting to polling stations. Similarly, the younger generation (ages 18-24), which only accounted for eight percent of the vote in 1996, may be more motivated to cast a ballot if it simply involves turning on their computer.

Another huge benefit of online voting is the ability to educate citizens in the weeks leading up to the election, empowering them to make a more informed decision when they vote. "The Internet has created an enormous opportunity for us to educate voters," said Brown. "This is just one example of how the Internet will improve the entire voting process."

The Internet is poised to revolutionize the voting industry by making the process more accessible and efficient for all. eBallot.net stands at the forefront of the efforts made to modernize the voting industry by defining new standards and working with legislators to bring a larger number of Americans to the polls. “eBallot is providing the technology to increase the reach of the election process,” concluded Brown. "This, in turn, will ensure that the voice of the constituencies within each voting district are heard."

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eCoverage
David Riker
founder and chairman
www.ecoverage.com

eCovering The World

Since the October 1999 Measuring the Internet Economy study, eCoverage.com has made good on its pledge to revolutionize the stagnant insurance industry. By accurately predicting that more and more people would flock toward the Internet “Superhighway” to manage their personal finances, the San Francisco-based online insurance provider has become a true Internet pioneer. The company’s early success has all stemmed from a relatively simple idea: the Internet allows for complete customer control. “eCoverage doesn’t exist just because we can sell insurance online,” said David Riker, founder and chairman, eCoverage. “We were born because the Internet makes us a better company and a better value proposition.”

eCoverage was founded in September, 1999 as a one-stop shop for Californians seeking comprehensive auto insurance. In the first half of 2000, eCoverage has successfully rolled out its online insurance program to over half the United States. At the same time, the company has developed product offerings specifically designed to captivate the Internet-savvy consumer.

Even conventional insurance companies such as Allstate have dipped into the Internet waters, recognizing its infinite depth. Although they have the brand and capital to eventually succeed online, traditional insurers face challenges not found with pure Internet providers. Traditional companies have to work around large agent bases and must cope with the headaches of transplanting old methodologies into the $20 billion Web online auto insurance industry. In addition, these companies must learn the Internet economy rules of listening to customers’ value propositions and offering flexible products. “It is very exciting to see old school companies understand the importance of the Internet,” said Riker. “It gives our business model instant credibility.”

Since the launch of eCoverage less than one year ago, more than a dozen

companies have entered the online insurance industry. All these start-ups are trying to capitalize on the Internet's ability to offer speedy quotes and claims processing as well as tremendous cost savings (up to 30 percent versus traditional pen-and-paper insurance providers). But eCoverage, using the business-enhancing power of the Internet, hopes to leapfrog its competitors by offering innovative insurance packages tailored for each specific customer need. "The Internet teaches us how to communicate with our customers and how to wisely invest more money in product innovation," said Riker. "We can target consumers and offer them a renters program and an auto policy, bundle it together and call it a college graduate package. It may be a cliché, but we think of it as an Internet-inspired insurance revolution."

By the end of 2000, eCoverage plans to offer a full line of personal insurance products for cars, boats, homes, and renters across all fifty states. And an aggressive branding campaign is slated to kick off this summer to help eCoverage generate interest and buzz. The company is wary of offering a guarantee of what the future holds, but does share its lofty goals. "Over the next four years, we have ambitious plans to develop over $1 billion in auto premiums," said Riker. "We believe the Internet will surely pave the way for eCoverage to become the most valuable insurance company ever."

(See "Start-up Demystifies Insurance Process" from October 1999 Report for original case study)

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MobShop
Jim Rose
co-founder and chief executive officer
www.mobshop.com

Strength in Numbers

Ever noticed how much money you save buying groceries in bulk? Imagine if there was a way to enjoy that same price break on some of your larger purchases. You could save hundreds on that digital camcorder you've been eyeing, or maybe even thousands on that new car, but you would need about 49 friends to go in on a group purchase with you. Thanks to the Internet, there's now an easy way to locate that group. San Francisco-based MobShop is bringing a new meaning to the phrase "the more the merrier" by helping individuals and small businesses benefit from the low prices normally reserved for larger firms.

Established in 1998, MobShop (formerly Accompany) is leveraging the Internet in a revolutionary way. By pooling large groups of individual buyers together on the Web, MobShop enables consumers to purchase products in bulk at substantial savings. Prices drop as more people buy, proving there truly is strength in numbers. "Word of mouth

spreads like wildfire on the Internet," explained Jim Rose, founder and chief executive officer, MobShop. "In group buying, there is an inherent desire and benefit in working together, so the customer actually becomes the salesperson."

MobShop has one of the few e-commerce business models where the customer has a direct incentive to get as many additional buyers on board as possible. So far, this business model has proven successful. The company's revenue growth rate increased 150 percent the last two quarters, and MobShop estimates that rate will climb another 100 percent by the end of this year. In just over a year, the company has grown from three employees to over 110, marking quite a management challenge for 26 year-old Rose. "As the company gets bigger, expectations rise and the market seems to move that much faster," said Rose. "The biggest challenge is not only to find people that can think creatively and are innovative enough to build the business, but also to find those people that have enough expertise and experience to manage such rapid growth."

MobShop's impressive growth rate would not be possible without the Internet. Aside from bringing buyers and suppliers together in a way that was impossible before, the Internet allows transactions to take place in almost no time. "We sold out 4,000 units of Exxon gas cards in 20 hours without advertising," noted Rose. "When you tap into something that is really relevant to a customer, the speed at which it travels is unbelievable." MobShop provides a huge potential for manufacturers in the business to business realm by connecting the suppliers with home and small businesses that were previously difficult to reach. And on the flip side, small businesses are able to pool together online and receive the same price breaks that were previously only available to Fortune 500 companies.

By negotiating deals directly with the manufacturer, MobShop is able to offer consumers access to over 800 popular products, a selection ranging from DVD movies to brand new Toyota Camrys, without actually having to warehouse the inventory. By grouping buyers from MobShop.com with customers from the 50-plus partner sites MobShop hosts group buying for, the company is able to harness the buying power of existing online communities like iVillage and eGroups Inc. Knowing that individuals within these communities often have similar interests, MobShop can easily target and pool groups of consumers together. "MobShop puts the power back into the hands of the consumer. By allowing individuals to leverage their dollars more effectively, MobShop ensures that consumers benefit from every transaction," said Rose. "I believe anything that people can do to bring supply and demand together and help manage it more efficiently is a benefit to this country."

At present, MobShop is focused on making its name and the power of its business model known throughout the country. Rose believes that the possibilities are infinite. "Ultimately the Internet is going to be so deeply integrated into every aspect of people's lives that we are not going to think of it as an independent entity in its contribution to the economy," said Rose. "Success for an online business comes when you have a business model that it is something completely different, something that would not exist without the Internet."

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Yupi.com
Gustavo Morles
senior vice president of new business development and content
www.yupi.com

Yo Quiero Yupi

Spanish-speaking Internet users make up one of the fastest growing online populations. Forrester Research estimates that by the end of this year, there will be approximately 3.6 million Hispanic Internet users in the United States. IDC predicts that the number of Spanish-speaking Internet users outside the United States will increase from about 8.3 million in 1999 to 20.6 million by the year 2002. As this community continues to grow, it will certainly need a home base on the Internet. Yupi.com, a Miami Beach, Florida-based start-up, is looking to be the destination portal of choice for Spanish-speaking communities around the world.

Originally founded in 1996, Yupi.com has a simple mission: help people who speak Spanish access the Internet in a way that is both fun and easy. Gustavo Morles, senior vice president of new business development and content at Yupi.com, realizes many Spanish-speaking people approach the Internet with hesitation. More often than not, the content found on the Web is posted entirely in English. Yupi cuts through the language barrier, allowing visitors simple, immediate access to its network of portals and web-based communities. "The Internet is a positive force that will continue to change society for the better," said Morles. "It is empowering people to communicate in new ways and enhancing the development of communities everywhere."

The name "Yupi" loosely translates as "yipee!" in English. "It is an expression of joy in every country that speaks Spanish," noted Morles. "It was important for us to find a name that could cross through cultural barriers and be understood as, 'Yupi! I've finally found something that works on the Internet.'"

By crossing cultural barriers, Yupi.com has achieved a level of success that founder, Carlos Cardona, only dreamed of a few years ago. Yupi now has almost four million registered users and the company's page views have increased by over 130 percent in the last year. Yupi.com generated revenues of over $3 million in 1999, and there is no question that that amount will increase substantially by the end of 2000. Yupi's popularity has caused the company's growth to skyrocket internally, as well. Since February 1999, the company has leapt from 10 employees to over 250 and opened offices in locations around the world, including Miami, Los Angeles, Spain, Mexico, Colombia, and Buenos Aries.

Yupi has spent next to no money on marketing, yet word of mouth is bringing customers to the site. With an extensive database of manually categorized links available in Spanish, it allows visitors to navigate the web easily and make sense of search results. Yupi users

(often referred to as "Yupinautas") also have the option of doing a translated search, meaning they can search the Web in any language and the results will be returned in Spanish. Searches can be customized to provide localized content that is relevant to specific countries. "It is important for us to feature best of breed content," said Morles. "Our goal is to offer anyone and everyone who speaks Spanish something that is relevant to them when they connect to Yupi."

Other Yupi services include free e-mail accounts, interactive chat environments, a proprietary homepage creation technology, access to a number of online stores, and even Yupi TV, a service that allows Yupinautas to watch programs right on their browser. Expanding the site's reach, Yupi.com also serves as the gateway to an extensive network of Spanish language web communities. "Yupi is not only a search engine or a directory," explained Morles. "Yupi is also a portal in the sense that we want to be your homepage, that place you always connect to when you enter the Internet."

Yupi plans to stay ahead by focusing on what they do best: empowering Spanish-speaking people to access the Internet. The company is presently experimenting with broadband technologies and looks forward to the positive changes that e-commerce growth will continue to bring for the company. "We have achieved and surpassed every benchmark we have set for the company," said Morles. "I am certain that we will continue to be leaders in this market segment by bringing the benefits of the Internet to Spanish-speaking communities around the world in a way that is both easy and enjoyable."

For additional information on Yupi.com, contact: Nerea Alvarez at 305-604-0366 x4113 (or) nerea@yupi.com

Layer Four: Internet Commerce Indicator

A Southern Season
Briggs Wesche
general manager
www.southernseason.com

A Southern Season For All

It's not unusual to find people salivating outside Chapel Hill's specialty food and gift shop, A Southern Season. For nearly 25 years, people have traveled from all over the South to sample the store's mouth-watering delights. When folks couldn't make the trip in the past, they perused the store's seasonal mail order catalog. But since establishing an online presence with southernseason.com, people from around the world can shop for goodies such as Appalachian Trail Mix, Bone Suckin' BBQ Sauce, Carolina Swamp Snacks and Tar Heel Toe Jam.

A Southern Season recognized the unlimited power of the Internet after launching its informational Web site in 1995. The site became a favorite among the store's loyal contingent of North Carolinians and spawned demand for the online store, which launched in October of 1997. Though no marketing dollars were spent at that time, Internet sales accounted for three percent of the company's total orders during its first holiday season. "At first, we viewed the Internet as another outlet for our existing customer base," explained Briggs Wesche, general manager, A Southern Season. "Our holiday season is notoriously chaotic. We wanted to give our customers a chance to avoid waiting in line. We certainly didn't expect our Internet sales to take off so rapidly."

A Southern Season continued to ride the Internet wave in 1998 as its holiday sales volume doubled from the previous year to six percent. The store's online sales volumes more than doubled again during the "e-holiday" of 1999 to 14 percent. In fact, the Internet became such an effective sales channel for A Southern Season that it received over 1,700 orders in one night, nearly equaling a week's worth of the store's mail order business. "We were accustomed to pushing the envelope during the holiday season," said Wesche. "The Internet sales nearly pushed us over the edge. But we somehow survived. I admit though, there are worse problems than having too many orders."

Because the Internet affected A Southern Season's sales orders so dramatically during the holiday season, the store plans to expand its current distribution center from 32,000 square feet to 50,000 in 2001. In the meantime, the store wants to duplicate its in-store experience online by revamping its Web site with more user-friendly features. "People always have a ball walking through our store; it's shopping as entertainment," said Wesche. "And before long, our online store will be sprinkled with A Southern Season's in-store charm. Sure, you won't be able to sample our North Carolina Praline Pecans, but you'll still have fun browsing through our overwhelming selection. That's a promise."

A Southern Season uses the Internet not only as a viable retail channel, but also as a

powerful business tool. The Web's research capabilities have enabled the store's management to track industry trends and competitor tactics much more effectively and efficiently. "It's a lot easier to browse Web sites than flip through 60,000 catalogs," said Wesche. "The Internet is allowing our little cottage industry to compete with bigger companies like Harry & David and Dean & Deluca. I think the Internet will not only help us expand our niche market, but also help us grow far beyond our Chapel Hill home."

Like most e-businesses, A Southern Season believes that it has yet to scratch the surface of its online potential. The store views its early online success as way to bring its Southern tastes into the homes of people across the globe. "The Internet provides us with limitless opportunities," said Wesche. "When we first launched the online store, I never imagined it would surpass our thriving mail order business. Now we're receiving sales orders from half way around the world. We're living proof that even a low-tech business like A Southern Season can excel online. Wherever this exciting ride takes us next, we'll be ready."

For additional information on A Southern Season, contact: Deborah Miller at 919-929-7133 (or) deborah@southernseason.com

SmarterKids.com
David Blohm
president and chief executive officer
www.smarterkids.com

Toys that Teach

Why is the sky blue? How many strawberries can I fit into my mouth? Kids are curious. Kids want to know everything and need to learn continuously. Why not satisfy their needs and give them all the learning they want, in a fun way? The Internet is allowing parents around the world to help their children grow intellectually, with toys that not only entertain, but also educate and challenge them. Needham, MA-based SmarterKids.com is set to lead the charge by providing parents with the information and advice they need to select the best educational products for their individual children.

Aimed at giving parents the tools to help their children learn, discover, and grow, SmarterKids.com is the pioneer in a rapidly evolving new industry called e-learning. Originally a producer of educational CD-ROMs, SmarterKids recognized an opportunity to expand the reach of its business by focusing on the Internet. "The Internet has created opportunities that we never had with CD-ROMs," explained David Blohm, president and chief executive officer, SmarterKids.com. "The Internet gives us the potential to differentiate ourselves from others in the marketplace and establish a lifetime relationship with our customers."

SmarterKids.com currently offers parents thousands of educational books, games, CD-ROMs, toys and activities. Each unique product has been reviewed by teachers on over 100 variables to ensure it meets all of the company's standards, such as safety and age

level. Every product has a rating scale of one to five stars, depending on its ease of use and perceived entertainment and educational value. "Our extensive testing procedure ensures the quality of our products," stated Blohm. "Thanks to the Internet, kids around the world can now benefit from these toys." SmarterKids' customer base has grown exponentially, with the number of registered learning profiles now exceeding 100,000.

On the road to success, SmarterKids.com has seen revenues soar in the last year. The company's total sales for 1999 grew dramatically to $5.4 million, and repeat customers accounted for approximately 30 percent of all orders. In one year, the number of employees has grown from 25 to 125. "We experienced a much more explosive growth with the Internet than we ever did in the CD-ROM business," said Blohm. "The Internet has provided us with the leverage to offer an extensive range of products on a broad scale, to a world-wide audience."

By leveraging the Internet, SmarterKids' is doing what educators have been trying to do for years: providing a way to select educational toys based on a particular child's needs. On the Web site, parents can map their children's abilities and children can take a fun skills test. "The Web site allows parents to provide as much information on a child's abilities as they wish," explained Blohm. "We utilize that information to recommend the best products available for each individual child." When a child scores low on math, SmarterKids.com will automatically select an array of products and toys designed to improve the child's skills in that discipline.

With MySmarterKids.com, the company's personalized Web site, parents can also create a private store and gather specific recommendations for each child. Taking advantage of the Internet's versatility, MySmarterKids.com offers parents real-time access to a live educational consultant for any kind of assistance. "The Internet allows us to offer a very personalized service," stated Blohm. "We help parents find the right products for a child's individual goals, education and needs."

As SmarterKids strives to become an integral part of every child's education, the company will continue to leverage the latest technologies the Web has to offer. "It won't be long before teachers everywhere will be able to automatically update children's learning profiles on our Web site," explained Blohm. "The Internet will make the connection between homes, schools and teachers very robust, opening up many new opportunities for SmarterKids.com in the future."

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Stacia New York
Stacy Johnson
Owner and designer
www.stacianewyork.com

Where the Fashionable Flock

Traffic has been running fast to Stacia New York -- both online and on foot -- since Stacy Johnson's one-of-a-kind Brooklyn, NY-based boutique was featured in the October 1999 Measuring the Internet Economy study. In the last year, profits rose 112 percent, sales increased by 231 percent, and Johnson has hired three additional employees to help fulfill the demand for items from her original Stacia New York women's clothing line.

Johnson attributes much of her success to the reach of the Internet. From the moment she opened her Smith Street boutique in January of 1999, Johnson knew she would also need an online outlet for her designs. "The Internet was the obvious choice for a small business like mine to reach a global audience," explained Stacy Johnson, owner and designer, Stacia NewYork. "The Web site not only drives business online, but also drives traffic into my brick and mortar store. Many customers visit my Web site, then come to the Smith Street shop to make their purchases."

Stacianewyork.com will account for ten percent of the company's sales this year alone, a figure Johnson estimates will double over the next two years. Additionally, the cost for maintaining the site is so low that any sale made from the Internet carries a significantly higher profit margin than one from her brick and mortar store. Since the site went live last August, hits have jumped from nine a day to an average of 900, coming from as far away as Turkey and Spain. Online sales rose an additional ten percent last October through December, contributing to a very successful holiday season for Stacia New York. "I think of my online boutique as another store; it is an investment," said Johnson. "In the next five years, the Internet will be a huge part of my business. I have to put forth the time, money, and energy to make sure I have an appealing Web site and do my best to promote it."

The large amount of press the store has received results entirely from Stacia New York's Internet presence. "Having a Web site allows magazine editors to easily take a look at my collection without actually coming to my store in Brooklyn," explained Johnson. "Without the Internet, I would not have had the press. The Web site has brought me free publicity which has increased the recognition of both the Stacia brand and product across the nation."

Johnson's next move will drive even more traffic to her site. Presently, she is heading the creation of FashionFlock.com, a fashion portal for boutique shopping that will link Stacia New York with similar designer-owned stores. "FashionFlock will be a home base for anyone who enjoys shopping on Smith Street or in Soho," explained Johnson. "The best

way of driving hits to stacianewyork.com is by bonding with people like myself. All sites will still be independent, but we will be linked together as part of a designer community." Johnson is currently helping other designers understand the potential of the Internet by assisting them with their Web site design. "The cost of running a Web site is small change compared to running a store," noted Johnson. "Designers need to understand that developing a Web site now is critical to the future success of their business."

Stacia New York's online boutique is responsible for making the Stacia brand known around the world. With business booming, both online and off, Johnson is planning to open up a West Coast store within the year to help meet demands for the Stacia name created by the Web presence. "My business plan has totally changed thanks to the power of the Internet. The business has become much bigger than I ever imagined," Johnson said. "I don't have to be dependent on another store or another mall or any other conglomerate to carry my business. The Internet allows me to function independently. It's just me and the customer."

(See “Boutiquely Internet” from October 99 Report for original case study)

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Productivity in the Internet Economy

The first two waves of our Internet Economy study measured and documented a dramatic growth of both infrastructure and commerce activity on the Internet. As suggested by Barua, Whinston and Yin (2000)[3], "Internet technologies and applications have grown more rapidly than anyone could have envisioned just five years ago, opening up new frontiers of interaction between consumers, businesses and trading partners." Undoubtedly the Internet is fundamentally changing business models, strategies, and processes, and is also creating new opportunities for the small but nimble and visionary. However, Barua, Whinston and Yin (2000) also ask whether this massive growth is productive and efficient, suggesting that *big* is not *necessarily* better. What evidence can we provide to suggest that this new economy is also productive? What are the characteristics of players who are creating maximum value by doing business on the Internet? This section summarizes the results of our study on the Information Technology (IT) related productivity of pure Internet based companies.

In this research, we distinguish between two types of "dot com" companies: digital and physical. Digital dot coms are Internet based companies such as Yahoo, Ebay and America Online, whose products and services are purely digital in nature, and which are delivered directly over the Internet. By contrast, the physical dot coms sell physical products (e.g., books, CDs, jewelry, toys) that are shipped to consumers. While the Internet is attributed to the very existence of both types of dot coms, do the IT investments made by these firms have the same positive impact on their bottom line? Our interest in the contribution of IT investments to the performance of dot coms stems from the fact that these businesses are highly technology intensive (e.g., 84.2 percent and 78.9 percent IT capital intensity[4] for digital and physical dot coms respectively). Further IT investments have the potential to make these companies highly scalable whereby their costs do not grow in proportion to their volume of business.

We hypothesize that IT investments contribute more to various performance measures (e.g., revenue, revenue per employee, gross margin and gross margin per employee) for digital dot coms than for physical dot coms. The rationale is that the level of digitization of business models, strategies and processes is much higher in digital product companies than in Internet based companies selling physical goods. While the Internet and electronic commerce applications are equally accessible to both types of companies, electronic retailers (e-tailers) of physical products often build warehouses, handle inventory, and are subject to many of the physical constraints of bricks-and-mortar companies. By contrast, due to the very nature of their business, most of the business processes and delivery mechanisms of digital dot coms are implemented online. Currently the physical dot coms also suffer from the lack of complementary digitization in their value chain. That is, while a physical dot com may have digitized its interactions with customers, its value chain partners may not have yet embraced the Internet for their operations. However, the true benefits of electronic commerce will not be harvested until all value chain partners enter the new economy. Further, the ability of a digital dot com to differentiate itself from its competitors directly depends on being able to translate innovative business strategies into online capabilities.

We analyzed 199 publicly traded digital and physical dot coms, and show that the productivity of both digital and physical dot coms is increasing significantly over time.

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[3] Barua, A., Whinston, A.B., and Yin, F., "Value and Productivity in the Internet Economy," Computer, May 2000, pp. 102-105.

[4] IT capital intensity is measured as IT capital divided by total capital.

However, IT capital (computer hardware, software and networking equipment) contributes significantly to all four output measures studied (revenue, revenue per employee, gross margin, and gross margin per employee) for the *digital* dot coms. However, the IT contribution for physical dot coms is uniformly insignificant across all four measures. This sharp difference in the contribution of IT to firm productivity raises issues regarding the market value of physical products companies on the Internet. We also find that the digital dot coms should be investing the marginal dollar in IT, while the physical products companies are better off by investing it in labor. This reflects a relatively high level of manual processes, especially in the fulfillment and logistics areas of e-tailing, and calls for rapid digitization of all business processes both within and outside the firm. Further, physical dot coms must rely more on alliances and partnerships with organizations that specialize in the areas of order fulfillment, and use electronic linkages for coordination and collaboration with such partners. The potential of the Internet Economy cannot be realized by only digitizing the front end (customer side) of a business and by relying on physical means to complete order fulfillment.

A few highlights of this study include::

- IT investments contribute significantly to revenue, revenue per employee, gross margin and gross margin per employee for digital dot coms
- IT investments do not have any significant impact on the same performance measures for physical dot coms
- Currently physical dot coms cannot increase performance significantly by adding more capital or labor resources
- Both types of dot coms are quickly getting better at doing business

Rationale and Model Development

All dot coms generate their revenues online and interact with customers directly over the Internet. Thus, some of the customer facing features of a digital products business may be similar to that of a physical dot com. The most important distinctions between a digital and a physical dot com, however, involve the degree to which business strategies, processes and relationships can be digitized and the type of inputs used by each company. The complete business model of a digital products company is reflected in its IT applications. For instance, a strategy of customizing content is implemented through online content personalization engines. Ebay’s pioneering and highly successful strategy of creating a feedback and rating system for all buyers and sellers is accomplished through Web-database connectivity tools. Intermediary services that find the lowest price and/or a combination of specified criteria for a product on the Internet are based on powerful search and comparison engines. In other words, any business strategy in the digital products world is directly translated into systems capabilities.

By contrast, the differentiation strategies of a physical products company on the Internet (e.g., an e-tailer) are often implemented offline, and may have little to do with IT. For instance, to provide the highest level of customer service, Amazon.com has large warehouses around the world that hold books, CDs and other physical products in their inventory. The motivation behind dealing with warehouses and inventory is the ability to provide fast delivery of goods to the customers. For instance, if Amazon.com sells 25 copies of a particular book on a given day, it cannot possibly rely on the publisher of the book to ship 25 copies within, say, twenty-four hours. Most publishers have not yet adopted electronic business processes to the extent where they can print any number of copies of a book on demand. As a result, e-tailers often hold inventory to be more

responsive to customers. In fact, 34 out of 45 physical dot coms in our sample maintain merchandise inventory, and handle packaging and shipping processes by themselves, citing customer service excellence as the primary reason. In this regard, e-tailers are not yet significantly different from their bricks-and-mortar counterparts. By contrast, the digital products companies manage content inventory directly through their Web sites and related applications.

As another example of the processes involved in the operation of a physical dot com, consider an online grocery store which uses its Web store front to take customer orders, but which must rely heavily on people and manual processes to fulfill the order efficiently and to the satisfaction of the customer. Thus a differentiation strategy for the online grocery store may call for investment in a faster delivery network.

An examination of the components of cost of sales of digital products companies and physical dot coms suggests some key differences in their operations. For the digital products companies, cost of sales consists of Internet connection, Web hosting, telecommunications, Web site infrastructure and development, networking, computer hardware, software development, payroll for Web site operation, and digital content provided by other companies. The cost of sales of most physical dot coms consists of the cost of merchandise sold and inbound/outbound shipping. It should be evident that the former category is highly scalable and is likely to enjoy increasing returns to scale.

There are other important distinctions between these two groups of companies. For instance, a digital products company can grow by creating more content alliances and by expanding and enhancing its Web presence. By contrast, an e-tailer has to undertake an elaborate and often labor intensive expansion program to grow the volume of business. The above observations are summarized in Table 1, and lead to the hypotheses stated below:

Characteristics of Digital and Physical Dot Coms

Characteristic	Digital.com	Physical.com
Interaction with Customer	Digital	Digital
Main Inputs (products)	Digital	Physical
Business and Expansion Strategies	Digital	Mainly Physical
Business Processes	Digital	Mainly Physical
Distribution	Digital	Physical

H1: For digital products companies, IT capital has a significant positive impact on (i) sales, (ii) gross margin, (iii) sales per employee and (iv) gross margin per employee.

H2: For physical dot coms, IT capital does not have a significant impact on (i) sales, (ii) gross margin, (iii) sales per employee and (iv) gross margin per employee.

The results of the study support both hypotheses. Further, we find that on an average, a digital products company in our sample can increase its annual sales by $1,045 by investing an additional $1,000 in IT capital. Since IT investments are capitalized over multiple years, the total revenue increase can significantly exceed this marginal investment. A digital dot com can also increase its sales by $28,461 by hiring one more

employee. However, as long as the unit employee cost is over $27,235, the digital dot com is better off by investing the marginal dollar in IT capital than in labor. Along similar lines, the company can get an additional $642 in annual gross margin by investing $1,000 more in IT capital, or $20,441 in additional annual gross margin by adding one more employee. As long as the unit labor cost is over $31,840, digital dot coms are better off investing the marginal dollar in IT.

The choice between IT capital and labor depends on the labor cost. While the actual figures are not available from the companies' annual statements, it is very reasonable to assume that the unit labor cost is higher than $31,840 for a digital dot com. While stock options in these publicly traded high growth digital product companies are likely to result in lower salaries relative to slow growth business sectors, 55 out of the 154 digital dot coms are located in California. Further, 62 others are based in expensive parts of the East Coast, implying that the total unit labor cost (salary plus benefits) will certainly exceed the above threshold. It should also be noted that these numbers represent averages over the entire sample, and that investments in IT capital and labor are not mutually exclusive.

Since IT capital has an insignificant impact on all four output measures for physical dot coms, investing the marginal dollar in IT will *not* lead to increased benefits with any degree of certainty. On an average, a physical dot com in our sample can increase its annual sales by $85,130 by hiring one more employee. Along similar lines, the company can get an additional $13,085 annual gross margin by adding one more employee. Unfortunately the cost of hiring an additional employee is likely to be significantly higher than the $13,085 additional gross margin attributable to the employee. There is also a striking difference between the average gross margins enjoyed by the two groups of companies. The digital dot coms have an average gross margin ratio of 44.4 percent, while the physical dot coms are only able to garner 17.8 percent.

Summary of Capital Inputs and Results for Digital and Physical Dot Coms

	Digital.com	Physical.com
Increase in Sales per $1000 invested in IT Capital	$1,045	Insignificant Impact
Increase in Gross Margin per $1000 invested in IT Capital	$642	Insignificant Impact
Increase in Sales per additional Unit of Labor	$28,461	$85,130
Increase in Gross Margin per Additional Unit of Labor	$20,441	$13,085
Threshold unit labor cost above which additional IT investment is preferred to additional labor	$31,840	Not applicable because IT has no positive impact

Note that the labor cost associated with a digital dot com is likely to be higher than that of a physical dot com. The reason is that a physical dot com may have many low paying jobs (e.g., warehouse and delivery related people), while employees in digital dot coms are likely to be more skilled and educated due to the nature of the jobs involved.

The good news for both digital and physical dot coms is that their productivity is increasing significantly over time. For instance, for the same level of capital and labor inputs, digital dot coms will get 34.5 percent more revenue and 25 percent more gross margin respectively after one year. The corresponding numbers for the physical dot coms are 39.8 percent and 41.9 percent, implying an even higher rate of improvement. Given the nascent stage of the Internet Economy, it is not surprising (but encouraging) that both categories of players are learning and discovering smarter ways to run their business.

Should the physical dot coms abandon ship?

In the absence of high levels of digitization in the fulfillment processes of the physical products companies as well as in the supply chains of their trading partners, it is not surprising that labor is currently a more productive input than IT capital for this group. The implication that the marginal dollar would be better spent on labor than on IT capital for physical dot coms only applies to the status quo – an environment marked by a high level of digitization only at the customer end of the business, but by manual and labor intensive processes on the “back office” side. In the long run, as digitization of business processes becomes more widespread throughout the value chain, we should observe a change in the role of IT capital in the production process even for the physical dot coms.

Our results do not suggest that physical products firms on the Internet should abandon their current business and start dealing with digital products. Instead they call for digitization of the entire business to be able to fully leverage the Internet. This digitization involves processes and strategies both inside and outside the organization. These firms and (perhaps more importantly) their trading partners must deploy new business models, redesign business processes including interaction with customers, order taking, coordination in fulfillment and delivery, and quality control. In sum, every aspect of the business other than the actual physical production and delivery must be digitized. Even the product itself may be digitized whenever possible, as witnessed in the online music and entertainment industry.

In addition, organizations need to form new alliances and partnerships to facilitate this move towards digitization. This may suggest outsourcing the delivery to other partners and concentrating on digitally coordinating the fulfillment and delivery processes. A good example that illustrates this principle is the business model of Dell Computer, another fine example of a bricks-and-mortar company that has achieved “virtual integration” with its suppliers over the Internet and has digitized its entire value chain. This Internet based digitization and reliance on others result in high gross margins, return on invested capital and revenue per employee figures. The mantra for the Internet Economy is clear: Substitute physical assets and manual processes with knowledge based assets and digitized processes.

As suggested by Barua, Whinston and Yin (2000), “businesses will realize the Internet’s maximum benefits when all players in the physical economy adopt the Internet in every aspect of their business. Today a relatively small percentage of US businesses actually use the Internet to sell products and services, while a vast majority continue to operate in the physical world, doing business as usual.”

Conclusions

Given that Internet related technologies and applications are equally available to all businesses today, IT alone cannot make a difference in the performance of the firm. The nature of the business, the ability to implement strategies and processes and manage channel relationships digitally would be important determinants of how much IT can contribute to a firm's business performance. In this study, we partitioned the world of dot coms into digital and physical types based on the extent of digitization of the business model and processes. From the results of the study we conclude that in Internet Economy, companies selling digital products can obtain greater productivity from IT than those selling physical products. It is not because the digital products companies are using different IT. The source of higher IT contribution is explained by the nature of digital products and services, which can be delivered digitally through the Internet at virtually zero cost. Further, once the content of a digital product has been developed, the marginal cost for making an additional copy or an automated modification of the product is basically zero. Therefore, unlike an e-tailer, the seller of digital goods and services does not have to invest in physical resources such as warehouses to increase the scale of operation; instead, it can invest in more productive IT infrastructure and applications.

Another implication of this research is the direction that IT developers will have to pursue. To meet the needs of the businesses moving toward comprehensive digitization, IT developers must concentrate on developing applications that will facilitate the digitization of currently physical business processes. For example, in the furniture retailing industry, current business processes usually involve retailers sending printed catalogs to potential customers or customers visiting local show rooms. To digitize this part of the business, Internet retailers will need new-generation virtual reality applications, which will make it possible for customer not only to see what a product looks like, but also to customize the product on the Internet.

Future research in this area should focus on companies that are undergoing the digitization metamorphosis. It will be important to study how the level of digitization of the business model enables a company to better exploit its IT investments.

Adopting Internet Technology to Drive Business Strategy

What does being an Internet Economy company really mean? From the definitions and metrics that we have developed for this study, it simply means that a company generates some or all of its revenues from Internet or IP-based products or services. Whether a company makes products that are specifically designed to be used for the Internet, or help other companies develop and implement an Internet business strategy, are considered an Internet Economy company. Furthermore, if the company has begun to sell its products and services over the Web, it is considered an Internet Economy company.

While this approach to classifying companies appears to distinguish an Internet Economy company from a non-Internet Economy company, we wondered if there were other business factors that created greater distinctions. After all, companies that make Internet and Web products are already very different from companies in other industries. And companies that have pursued an e-commerce strategy have clearly adopted a very different business strategy than most brick and mortar companies. To get a better understanding of what distinguished an Internet Economy company from others, we chose to focus on whether or not Internet technology has a significant impact on a company's business strategy. In order to look at this impact, we conducted a separate research study on a general sample of US businesses and compared those findings to new data points collected in our study of the Internet Economy.

What we found was a startling contrast. For every ten Internet Economy companies we spoke with, eight believe that their Internet-based applications have created a significant competitive advantage for their company (see summary table below). Of the general sample of US companies, fewer than five out of ten companies believe that their Internet-based applications had created a significant competitive advantage. Clearly, Internet Economy companies have embraced Internet technology as a significant part of their overall business strategy, to the point where these companies are significantly more likely to see a return on their investment.

Business Advantages of Internet Applications

Not only have Internet Economy companies seen greater business or competitive advantage in return for their investments in Internet technologies, but these advantages have manifested themselves in quantifiable returns. Internet Economy companies were almost three times more likely to see expense or cost reductions as a result of their investment in Internet applications than US businesses overall. Furthermore, Internet Economy companies were two and a half times more likely to see productivity gains from their Internet applications, and more than two and a half times more likely to see market share growth and penetration of new markets as a result of their Internet applications.

But the most telling sign that Internet Economy companies have truly embraced Internet technology as a serious competitive advantage is the significantly greater adoption rate of Internet technology as a driver of overall business strategy. Compared with the general sample of US companies, Internet Economy companies were well over three and a half times more likely to adopt Internet technology as a driver of their business strategy.

Conclusions

It's not too late for the rest of the economy to join the Internet Economy. Whether your products and services are Internet or IP-based, or whether companies even sell their products or services over the Web, they can embrace Internet technology as a means to improving their bottom line. If the companies that operate in the Internet Economy can realize cost savings, productivity gains, increased market share and penetration of new markets by incorporating Internet technology into their business strategies, so too can the companies that are currently operating outside the boundaries of the Internet Economy. Every company should be figuring out how to join the Internet Economy and evolve their business strategies to include Internet technology. They should do it now – before their competitors and new entrants leverage Internet technology to pass them by.

Internet Economy Indicators

Is your company adopting Internet technology to drive business strategy?

Percent of Respondents who said "Yes"	Internet Economy Companies	Sample from US as a Whole
Have any of your Internet-based products or services created any significant business or competitive advantages for your company?	87%	44%
Have you experienced any expense or cost reductions as a result of your Internet-based products or services?	63%	23%
Have you seen any gains in employee or equipment productivity?	73%	29%
Have you seen any increases in your market share that you would attribute to your Internet-based products or services?	68%	24%
Have you been able to increase your penetration of a new market as a result of implementing your Internet-based products or services?	72%	25%
How strongly do you believe that your company is adopting Internet technology to drive business strategy? **(% that "agree" or "strongly agree")**	71%	21%

The Research Team

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Jay Shutter

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Jon Pinnell

Jon is Executive Vice President of MarketVision Research, Inc. and is responsible for the firm's advanced quantitative research and analysis. He is recognized as a pioneer in developing and applying new research methods and is a frequent presenter at research conferences. Before joining MarketVision Research, he was the Director of Marketing Sciences at IntelliQuest. Jon has degrees from The University of Kansas and The University of Texas.

Appendix A: Defining the Internet Economy

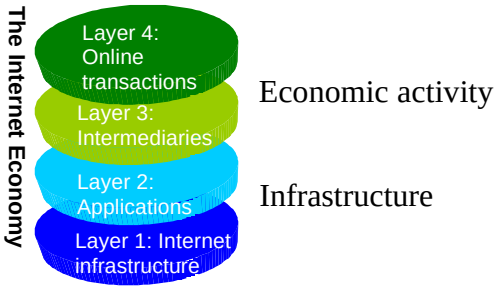
Research in Electronic Commerce has almost exclusively focused on the number of Internet users, demographics and various aspects of online buying and selling. However, as we looked at how to better understand the impact of the Internet across all business sectors, our focus turned to measuring the size and growth of the Internet Economy. Our first challenge was to determine how to define this emerging economy.

The first step in defining the Internet Economy was to build a conceptual framework and taxonomy. The Internet Economy can be conceptualized as a collection of IP based networks, software applications and the human capital that makes the networks and applications work together for online businesses, and agents (corporations and individuals) who are involved in buying and selling products and services in direct and indirect ways. There is a natural structure or hierarchy to the Internet Economy that can be directly traced to how businesses generate revenues. Based upon this type of structure, we broadly classify the Internet Economy into infrastructure and economic activity categories.

The infrastructure category is further divided into two distinct but complementary “layers”: the Internet infrastructure layer which provides the physical infrastructure for Electronic Commerce, and the Internet applications infrastructure which includes software applications, consulting, training and integration services that build on top of the network infrastructure, and which makes it feasible for organizations to engage in online commerce.

The economic activity category is also subdivided into two layers: online transactions and electronic intermediaries. The intermediary layer involves the role of a third party in a variety of capacities: market maker, provider of expertise or certification that makes it easier for buyers to choose sellers and/or products, search and retrieval services which reduce transaction cost in an electronic market, etc. The transactions layer involves direct transactions between buyers and sellers like manufacturers and e-tailers.

While we could take the position that e-tailers are also an intermediary between the consumers and manufacturers, the illustration below highlights the difference between an e-tailer like Amazon.com and an electronic intermediary in the purest sense of the term. An intermediary would also specify where a book or CD could be found at the lowest price or shortest delivery time or some combination of criteria specified by the consumer. By contrast, Amazon.com only displays its own catalog, prices, availability and lead-time. Of course, it is true that for the case of e-tailers, the difference between the two topmost layers could be a matter of degree.



Layer One: The Internet Infrastructure Indicator

A physical economy critically depends on an efficient infrastructure involving transportation, energy, raw materials and skilled workforce; likewise the growth of a digital economy depends on the ubiquitous presence of high speed and intelligent electronic networks, and the ability to share any type of content between all agents in the economy. Accordingly the Internet Infrastructure layer includes companies that manufacture or provide products and services that make up the Internet network infrastructure. This layer includes companies that provide telecommunications and fiber backbones, access and end-user networking equipment necessary for the proliferation of Internet based Electronic Commerce. Below is a list of the types of companies in layer one:

- National and regional backbone providers (Qwest, MCI Worldcom)
- Internet Service Providers (Mindspring, AOL, Earthlink)
- Network equipment for backbones and service providers (Cisco, Lucent, 3Com)
- Conduit manufacturers (e.g., Corning)
- Server & client hardware (Dell, Compaq, HP)

Layer Two: The Internet Applications Infrastructure Layer

Products and services in this layer build upon the above IP network infrastructure and make it technologically feasible to perform business activities online. In addition to software applications, this layer includes the human capital involved in the deployment of Electronic Commerce and E-Business applications. For example, Web design, Web consulting and Web integration are considered as a part of this layer. This layer includes the following categories:

- Internet consultants (USWeb/CKS, Scient)
- Internet commerce applications (Netscape, MS, Sun, IBM)
- Multimedia applications (RealNetworks, Macromedia)
- Web development software (Adobe, NetObjects, Allaire, Vignette)
- Search engine software (Inktomi, Verity)
- Online Training (Sylvan Prometric, Assymetrix)
- Web-enabled databases (Oracle, IBM DB2, MS SQL Server; only Internet/intranet related revenues are counted here)
- Network operating systems
- Web hosting and support services
- Transaction processing companies

Layer Three: The Internet Intermediary Indicator

Internet intermediaries increase the efficiency of electronic markets by facilitating the meeting and interaction of buyers and sellers over the Internet. They act as catalysts in the process through which investments in the infrastructure and applications layers are transformed into business transactions. While much has been written about a large-scale disintermediation in the transformation of the physical to the digital economy, the Internet necessitates a new breed of intermediaries whose roles are naturally information and knowledge intensive.

In the physical world, intermediaries are distributors and dealers, whose primary role is to increase the efficiency of distribution and to lower buyer transaction cost by locating close to the customer population. By sharp contrast, physical proximity is not an issue on the Internet; online search, evaluation, communication, coordination, assurance of vendor and product/service quality are the important aspects in the Internet Economy, and Internet intermediaries play a critical role in filling information and knowledge gaps which would otherwise impair the functioning of the Internet as a business channel. This layer includes:

- Market makers in vertical industries (VerticalNet, PCOrder)
- Online travel agencies (TravelWeb, 1Travel)
- Online brokerages (Etrade, Schwab.com, DLJDirect)
- Content aggregators (Cnet, Zdnet, Broadcast.com)
- Portals/Content providers (Yahoo, Excite, Geocities)
- Internet ad brokers (Doubleclick, 24/7 Media)
- On line advertising (Yahoo, ESPN Sportszone)
- Web virtual malls

Layer Four: The Internet Commerce Indicator

This layer includes companies that generate product and service sales to consumers or businesses over the Internet. This indicator includes online retailing and other business-to-business and business-to-consumer transactions conducted on the Internet.

- E-tailers selling books, music, apparel, flowers etc. over the Web (Amazon.com, eToys)
- Manufacturers selling direct such as computer hardware and software (Cisco, Dell, IBM)
- Transportation service providers selling tickets over the Web (Continental, Delta, United)
- Online entertainment and professional services
- Shipping services (UPS, Federal Express, Airborne)

It is important to note that many companies operate at multiple layers. For instance, Microsoft and IBM are important players at the Internet infrastructure, applications, and Internet commerce layers, while AOL (before the acquisition of Netscape) is a key player in the infrastructure, intermediary and commerce layers. Similarly Cisco and Dell are important players at both the infrastructure and commerce layers. Even though the four-layer Internet Economy framework makes it difficult to separate revenues for multi-layer players, the framework presents a more realistic and insightful view of the Internet Economy than a monolithic conceptualization that does not distinguish between different types of activities. Further, the multi-layered approach lets us analyze how companies choose to enter one Internet layer, choosing later to extend their activities to the other layers.

Each layer of the Internet Economy is critically dependent on every other layer. For instance, improvements in layer one can help all other layers in different ways. As the IP network infrastructure turns to broadband technologies, applications vendors at layer two can create multi-media applications that can benefit from the availability of high bandwidth. Companies at layers three and four can benefit from improvements in both layers one and two from being able to provide media-rich content to consumers as well as offer new digital products and services (information and software goods that are delivered online). This interdependence also exhibits itself in the form of alliances where conduit and content providers or applications vendors and e-tailers join hands to create bundled offerings that are valuable to consumers.

Appendix B: Future Directions of the Research

In the third wave, we have sized the 1999 Internet economy, and have shown that the growth of this new economic system continues at an unprecedented rate. In this report we have also raised questions about how productive this economy is, and have begun investigating the productivity of players in this new space. We need to expand the productivity research to traditional companies who do not sell products or service over the Internet, but who are leveraging the Internet, intranets and extranets for internal as well as inter-firm communication, coordination, and collaboration. Further, future research should also focus on the linkage between the level of digitization in the business models, strategies and processes of clicks-and-mortar companies and their productivity and efficiency metrics. Since such holistic adoption can bring about the true benefits of the new economy, research effort should also be focused on measuring the extent to which businesses are embracing the Internet and related technologies in every aspect of their business operations.

Appendix C: Researching a Large Company – A Case Study

Measuring the Internet Economy requires strong knowledge of traditional market research techniques, expertise in technology markets and a firm understanding of the Internet itself. While this would seem to be relatively straightforward, it was not. The unique challenge of this study lies in the nature of the data to be collected. Since many companies have not even begun to think about tracking their Internet revenues separately, the process for collecting solid estimates requires even more careful preparation than the typical market research project.

Process

The following case study outlines the process used to collect information from some of the larger companies covered in the project. This case study presents the steps taken to prepare for the interview and highlights challenges that may arise in a typical interview.

1. Company is assigned by project manager from a database of all companies that have a high probability of contributing to the Internet economy, are US based, and meet a revenue threshold of $25M in annual revenues. Companies were preliminarily selected based on web searches and periodical review, and then were screened via Hoovers and Silicon Investor for basic criteria.

2. Researcher locates readily available public-domain data such as company contact information, gross WW quarterly revenues (found in 10-Qs, 10-Ks, annual reports, Hoovers, Silicon Investor, among other resources), WW employees at two points in time (FY98 and FY99), and pertinent information such as subsidiaries owned, competitors, recent news and history. The researcher then uses a variety of sources to find publicly stated information regarding percent WW revenue attributable to the US, percent WW employees attributable to the US, and percent of product lines attributable to the Internet. The researcher assesses which layers apply to the company's businesses and record the products/divisions into columns on a spreadsheet representing the different layers 1-4.

3. The researcher then tries to make contact with the company. Methods that have met with success vary by researcher, by industry and by company. Calls are made to various departments and contacts, such as PR, IR, HR, Finance, and Marketing. A combination of calls, e-mails and faxes are sent, as appropriate.

4. Once a company has been completed, it is submitted to the Project Manager and the database manager for entry into the database, which calculates summary data automatically.

Assumptions

In order to assure consistency of measurement and estimation, a set of assumptions has been developed to guide decisions about companies or allocation of revenue as they arise during the data collection and summary process. These assumptions are detailed below.

1. Quarterly revenue is recorded on a calendar basis, in an effort to reflect a fairly consistent time frame (as opposed to fiscal revenues which vary by company)

2. Quarterly employee data is usually unavailable and is very difficult for contacts to provide. In absence of this quarterly data, we have determined that collecting data at the end of the year is the best alternative. FY98 data is collected as is used as a representation of Q1 1999 and FY99 data is collected and is used as a representation of Q4 1999.

3. Because it is often difficult to find reliable information for certain data points, we have come up with "rules & formulas" on which to rely as a default. For instance, if we are unable to obtain the "percent of employees that are attributable to the Internet", we use the same percentage as that given to represent "percent of revenue that is attributable to the Internet". Another example is "percent of WW revenue attributable to the US." In the event that we are unable to find the percentage for either Q1 1999 or Q4 1999, the two points in time that will be used to represent the four quarters that we are analyzing, and in lieu of any information that tells us that this percentage significantly differed quarter to quarter, the percentage will be assumed to be equal.

4. In the instances where we cannot make good contact at a company, the researcher will make an evaluation and informed estimate as to percent revenue attributable to the US, percent revenue attributable to the Internet and percent split by layer. Although in a majority of cases, the researchers found that this information is available in press releases and in company information. The exception being the layer splits, as this is an indicator exclusive to this study. In the absence of actually confirming/conversing with a company contact, the layer splits are estimated based on product/divisions by layer and an investigation into revenue by product/division. All researcher-based percents will be documented in the comment section of the database.

Challenges

1. The biggest challenge is identifying a contact in each company that is willing to share the requested data.

2. Another challenge lies in the analysis of companies that hold multiple subsidiaries at partial rates. We have consulted with an accountant on handling of these situations and have made our best efforts not to double count any companies. ***Example:*** Safeguard Scientific: Safeguard owns an interest in at least 18 companies, ranging from 12-57percent. In addition, they own a number of venture funds. Two issues present themselves; which subsidiary's revenues are reflected in Safeguards Income Statement and at what percentage and if not fully accounted for, when analyzing subsidiaries, will we be double counting? It appears that Safeguard obtains significant revenues from CompuCom (56 percent ownership stake) and Tangram (57 percent ownership stake). Based on 1998FY reported revenues, it appears that $1981/2275M is from CompuCom and $21M is from

Tangram. Our next question was whether or not the remaining 16 companies are reflected in the Safeguard balance sheet. Logic might tell us that they would only report revenues for those companies in which they hold a majority. But, Safeguard owns 55 percent of XL Vision and it does not appear they record any representative earnings. Does this imply that there are simply no significant revenues to date or that they are not reporting those earnings? And, is Safeguard reporting fully CompuCom's earnings at $1981M? Further investigation shows that actual FY98 revenues for CompuCom were $2254M. Why is Safeguard reporting 87 percent of CompuCom's earnings if they only own 55 percent? And, should we account for the balance of their revenues, $273M? If reporting follows a consistent pattern, it would make sense that Safeguard would only be reporting a portion of Tangram's revenues. An investigation into Tangram shows that their total FY98 revenues were $21M, the same amount reported as earned by Safeguard. Another aspect to this challenge is inclusion of the companies in which Safeguard holds a minority stake. Take, for example, Sanchez Computer Associates, in which Safeguard owns 25 percent. Sanchez reports FY98 earnings of $44M. But, does Safeguard report any earnings from subsidiaries in which it holds a minority stake? Upon detailed investigation into the Company's Annual Report, we found the following statement,

"The net sales and related costs and expenses of a partnership company are included in the Company's consolidated operating results if the Company owns more than 50 percent of the outstanding voting securities of the partnership company. Participation of shareholders other than the Company in the earnings or losses of a more than 50 percent owned partnership company is reflected in the caption 'minority interest' in the Consolidated Statements of Operations. Minority interest adjusts consolidated net earnings to reflect only the Company's share of the earnings or losses of the partnership company". "Partnership companies in which the Company owns 50 percent or less of the outstanding voting securities, in which significant influence is exercised, are accounted for on the equity method of accounting. Significant influence is presumed at a 20 percent ownership level; however the Company applies the equity method for certain companies in which it owns less than 20 percent of the voting interest when it exerts significant influence through representation on those companies' Boards of Directors and other means." *This continues on for another half of a page in the annual report.*

As one can see, accurately assessing the revenues and where they are coming from is a confusing task. And, this is only the "revenue". We still need to ascertain the percent of revenue attributable to the US, the percent attributable to the Internet and the percent attributable to each layer.

3. Obviously, data is not always presented in a neat bundle, nor is it presented in a predictable manner. For instance, some companies have fiscal periods that do not coincide with calendar quarters; a company's fiscal quarter might end July 31st, instead of June 30th. In this and similar instances, a judgment is made on how to handle the data. In the case of unaligned quarters, the decision was made to assume that the fiscal quarter equaled the calendar quarter, acknowledging the miscalculation of a month period. The discrepancy is recorded in the database.

Appendix D: Secondary Research Summary

Overall Internet Economic Trends

IDC PREDICTIONS AND TRENDS

- The billion-user Internet: In 1995, when there were a scant 19 million Internet users, IDC predicted a new economy built on a base of over 1 billion people connected to the Internet by 2005. Today, there are over 200 million online.

- Business-to-business (B2B) dominance: In 1996, as portals and electronic retailers ("e-tailers") grabbed most of the headlines, we pointed out that B2B E-commerce would be preeminent and would increasingly dominate through 2003. Remarkably, Wall Street and many others have just taken notice, as B2B ".coms" have led the latest round of hot Internet initial public offerings (IPOs).

- Cheap and free appliances and PCs: In 1996 and 1997, we predicted that "information appliances" would emerge and ultimately outnumber PCs as Internet access devices. We also predicted that PCs would drop to $500 and below, and that appliances and PCs could quickly become "giveaways" for online businesses attracting customers. This year's rollout of Web-enabled mobile phones and wireless personal digital assistants (PDAs), as well as the "free PC" movement, have borne out this prediction.

- IDC forecasts that 2000 will see the US Internet user population nudge up to the 50 percent threshold of 137 million. Worldwide, the Internet user population will exceed the population of the United States, which is 274 million. In the five years we have been forecasting Internet growth, we have been consistently wrong -- on the low side.

- In 2000, free Internet access deals will expand to all major e-merchant segments: brokers, banks, retailers, travel companies, etc. In some cases, free Internet appliances (e.g., Web phones, PDAs, and PCs) will also be offered. Thus, Kmart's eyebrow-raising deal with Yahoo! offering free Internet access to those who register at Bluelight.com is going to look very, very common by the end of the first quarter. Wal-Mart and America Online (AOL) have announced a joint effort as well but have not yet revealed Internet access pricing. In our view, it better be zero or it will be a bust

- Digital marketplaces: In the B2B world, the number of online digital marketplaces, exchanges, and vertical portals will rise from about 500 to nearly 10,000 worldwide. Among the newcomers will be consumer crossovers Yahoo!, AOL, and others (see below).

- Affiliate marketing: Internet-based affiliate programs will generate almost $5 billion in 2000, or about 10 percent of all US online consumer
  E-commerce.

- Broadband to the home: This will be by far the biggest technology step forward in Internet adoption. By the end of 2000, over 1 in 10 online households will have high-speed Internet access – about 2.5 times the number in 1999. Cable will dominate, but digital subscriber line (DSL) will come on strong, with the benefit of armies of resellers. Ten percent penetration may not seem like much, but it will be more than enough to spur development of content and applications that take advantage of speed (and always-on). In a recent IDC *Internet Executive ePanel* survey, almost 40 percent of respondents indicated that they will have developed special content targeted to broadband users by the end of 2000. This is important because by 2003 over one-third of US online homes will have broadband. Leaders are getting ready now. (And -- oh yes -- open cable is inevitable.)

- Home LANs: By the end of 2000 almost 38 percent of US households with PCs will have two or more LANs. Shared Internet access (especially pricey DSL and cable) and shared printers and disks will be strong incentives for these households to install home networks. IDC predicts that in 2000, almost 20 percent of homes with multiple PCs will have a network, up from 10 percent in 1999. Leading technology contenders: wireless and telephone line. Source: IDC Predictions 2000 Bulletin #W21342 - December 1999-ITResearch
- The total US Internet economy more than doubled between 1996 and 1997, from $15.5 billion to $38.8 billion. By 2001, the total US Internet economy is projected to be over $350 billion. Business-to-business e-commerce is expected to account for the largest share, $186 billion. Consumer retail activity is expected to emerge more slowly, possibly totaling $18.4 billion in 2001. Source: http://www.business.gov July, 1999

- A quarter century from now, says Deloitte Consulting, manufacturers won't so much be pushing products on consumers as customers will be pulling products onto the market. "In the year 2025, the world will be dominated by customer-centric notions," Deloitte says. Consumer buying power and the "pure raw horsepower" of the 'Net and other communication technologies will have made "the individual consumer absolutely dominant.

- Flexibility will become the distinguishing characteristic as more manufacturers look like "a dynamically configured holding company," Deloitte anticipates. "Pretty much, anything goes. There are no rules,". "What it means is that no one configuration--no matter how radical--is going to sustain you. You have to be able to reconfigure to seize market opportunities over and over again." And it means being able to operate all over the globe--particularly in Asia. By the year 2025, companies will have an even greater need to be in such places as China, which by then will have emerged as the No. 1 economy in the world. Source: IndustryWeek April 12, 2000

INTERNET ECONOMY DOLLARS

- Worldwide demand for Internet services was $16.2 billion in 1999 and is expected to grow to $99.1 billion by 2004. This increase represents a five-year compound annual growth rate (CAGR) of 44 percent for the period. This worldwide growth is being driven by the increasing number of dot-com organizations, the adoption of Internet technology by corporations, and the number of Internet users. The United States represents the largest part of the worldwide Internet services market opportunity throughout the forecast period. The $8.8 billion in spending in 1999 is expected to increase to $44.0 billion by 2004. These figures represent a five-year CAGR of 38 percent for the period 1999-2004. Source: Worldwide Internet Services Market Forecast and Analysis, 1999-2004, March 2000 IT Research
- Today's top moneymakers in the Internet economy are those companies selling the infrastructure to make the Web and e-commerce work. Other winners include content providers and Internet access services. By 2001, as more business is transacted on the Internet, business-to-business e-commerce will topple today's leaders. Source: E-Biz Business Week October 7, 1999

The U. S. Internet Economy
(in billions of dollars)

Year	Total US Internet Economy	Infra-Structure	Access Providers	Financial	Intra-xbusiness	Consumer	Content
1996	15.5	4.4	4.2	0.235	0.806	0.583	5.2
1997	38.8	8.5	6.7	1.2	7.9	2.5	12.1
1998	72.5	16.5	11.2	2.5	17.3	5.0	20.1
1999	128.3	27.3	19.7	3.2	42.1	8.3	27.9
2000*	234	41.7	33.1	4.1	105.8	12.7	36.6
2001*	354.5	58.9	48.1	5	186.1	18.4	38.1

*Forrester Research Inc. estimates Source: E-Biz Business Week October 7, 1999

- Spending on digital solutions is critical for future growth based on economic forecasts from the Keenan Group, a leading market research firm, over the next three years gross domestic product (GDP) is expected to grow at a compounded annual growth rate of approximately 4.9 percent per annum, reaching over $10 trillion by 2002. At the same time, Internet commerce is expected to grow approximately 67 percent per annum, reaching nearly $450 billion by 2002 or 4.4 percent of total. Clearly, the significance of e-commerce as related to overall GDP cannot be ignored.

Internet Commerce as a Percentage of GDP
(in billions of dollars)

	1996	1997	1998	1999	2000	2001	2002
US GDP	$7.636	$8.802	$8.415	$8.802	$9.223	$9.672	$10.160
Y/Y Change	6.2%	5.5%	4.5%	4.6%	4.8%	4.9%	5.0%
Internet Commerce	$2	$13	$40	$95	$187	$299	$446
%GDP	**0.0%**	**0.2%**	**.05%**	**1.1%**	**2.0%**	**3.1%**	**4.4%**

Source: The Keenan Report & MSDW Research

- In our view, given accelerating demand trends, we anticipate that current market size forecasts will require upward revisions. According to International Data Corporation (IDC), the market for Internet Services is expected to reach $129 billion by 2004, representing a 44 percent CAGR (defined as the consulting, design, systems integration, support, management, and outsourcing services associated with the development, deployment, and management of Internet sites). Source: The Internet Consulting Report, April 2000 Morgan Stanley

- US companies generated some $301 billion in revenue from Internet-related business last year and employed 1.2 million workers in Internet jobs, according to the most comprehensive study yet of the "Internet Economy." In 1998, the study said, the Internet surpassed the energy sector ($223 billion) and the telecommunications sector ($270 billion) and was nearly as large as the $350 billion US automobile industry. Looked at another way, the Internet Economy is so vast it exceeds the gross domestic products of many nations. If it were a country it would rank 18th, behind Switzerland and ahead of Argentina. Source: Forbes June 10, 1999

- US businesses will exchange an estimated $17 billion in goods and services this year over the Internet, more than double the amount in 1997, according to Forrester. By 2002, that's expected to explode to $327 billion. Combine that with cost savings to business and online consumer buying and the Internet could add an estimated $10 billion to $20 billion to gross domestic product in four years. Source: E-Biz Business Week May 8, 2000

- As the Internet tears down the walls of geography, companies are creating entirely new businesses and tapping markets they never could have reached before. Source: E-Biz Business Week May 8, 2000

- Of the 50 stocks that make up the Internet Stock Index, or ISDEX, only 14 are currently profitable. Some 45 companies in the index are pure Internet plays, meaning that they get all of their revenue from the Web -- and 82 percent of those lose money. Source: E-Biz Business Week September, 23, 1999

How the Internet Changes (Almost) Everything

Businesses are ahead of consumers in embracing the Internet. Even the slow-growing business markets are bigger than fast-growing consumer sectors.

BUSINESS PURCHASES:

Early Adoption

- DURABLE GOODS: Led by makers of computers and other high-tech hardware, more than 43 percent of durable-goods manufacturers will conduct business-to-business commerce over the Internet by 2001, with sales reaching $99 billion.

- WHOLESALING: Companies that wholesale office supplies, electronics goods, and scientific equipment are embracing the Net. Projected sales by 2001: $89 billion.

Later Adoption

- SERVICES: Doctors, lawyers, and accountants generally provide their services in person--one reason the sector will be slower to adopt E-commerce. Projected sales by 2001: $19 billion.

- TRANSPORTATION: Most transportation companies are already committed to the alternative known as electronic data interchange (EDI), so Forrester says Internet sales by 2001 might be only $300 million.

CONSUMER PURCHASES:

Early Adoption

- TRAVEL: Flyers are bedeviling agents by browsing the Internet for bargain fares. Sales in 2001: $7.4 billion.

- COMPUTER HARDWARE AND SOFTWARE: It's an ideal sector for E-commerce. Buyers tend to be Internet-savvy, and you don't need to sniff, squeeze, or try on the merchandise. Forrester projects 2001 sales of $3.8 billion.

- BOOKS, MUSIC, AND ENTERTAINMENT: This is a sector where online purchases may raise total spending, not just cannibalize sales from brick-and-mortar merchants. Forrester's 2001 forecast is $3.8 billion.

Later Adoption

- HOUSING: The Internet is a great place to browse for houses, apartments, and mortgage loans, but transactions are still being done the old-fashioned way.

- FOOD AND BEVERAGES: Supermarkets won't be closing their doors anytime soon. Forrester pegs 2001 sales at $460 million--less than for gifts, flowers, and greetings.

- SERVICES: Telemedicine notwithstanding, health care is still a face-to-face business. Same goes for most other services--except computer updates and fixes, which are an online natural.

Source: FORRESTER RESEARCH INC., BUSINESS WEEK 5/8/00

CONSUMER INTEREST

- It took the pager 41 years to gain 10 million consumers; the telephone 36 years; the VCR took 9 years to reach 10 million consumers. The commercialization of the Internet took 2 years.

- In just three years, the Internet has gone from a playground for nerds into a vast communications and trading center where some 90 million people swap information or do deals around the world. It took radio more than 30 years to reach 60 million people, and television 15 years. Never has a technology caught fire so fast. Source: E-Biz Business Week May 8, 2000

WEB BUSINESS

- Investments by consulting corporations into dot-com businesses allow consulting corporations to re-energize incentive systems for employees and retain staff through offering stock options and salaries. Source: Wall Street & Technology, March 2000.

Web economics change business company plans/goals/budgets. Now based on quarters or even weeks (rather than fiscal/calendar year). Customer expectations guide projects. There has been a move from build and sell to sense and respond. Source: Business Week, November 1999.

Layer 1: The Internet Infrastructure Indicator

Consumer Internet Service Provider Subscribers and Share, Q4 1999

Rank	Service Provider	Subscribers	Q3 1999 to Q4 1999 Growth (%)	Share (%)
1	America Online	19,740,000	12.8	39.7
2	EarthLink/MindSpring	3,100,000	8.3	6.2
3	MSN Internet Access	1,710,000	-5.0	3.4
4	AT&T WorldNet	1,479,000	-1.4	3.0
5	NetZero	1,450,000	42.2	2.9
6	Prodigy Services	1,138,000	11.0	2.3
7	WebTV	1,000,000	25.0	2.0
8	Excite@Home	897,000	33.5	1.8
9	Freeinternet.com (Freei.net)	764,189	196.7	1.5
10	AltaVista (1stUp.com)	734,797	156.9	1.5
11	BellSouth	710,000	13.4	1.4
12	OneMain.com	701,000	25.0	1.4
13	SBC Communications/PacBell (estimated)	650,000	15.0	1.3
14	Juno Online Services	550,000	105.2	1.1
15	Road Runner	550,000	31.0	1.1
16	RCN Erols	545,382	-1.4	1.1
17	GTE.net	460,000	-6.3	0.9
18	USWest.Net	380,000	23.8	0.8
19	Voyager.Net	335,000	14.0	0.7
20	FlashNet Communications	234,000	-2.9	0.5
	Subtotal	**37,128,368**	**NA**	**74.6**
	Other	12,635,392	NA	25.4
	Total	**49,763,761**	**NA**	**100.0**

Source: Consumer Internet Service Provider Market Share Update, 1999
Steven T. Harris Bulletin #W22065 - April 2000 – ITResearch

- Industry analysts estimate that the number of remote access lines in the US will grow from approximately ten million in 1996 to approximately 30 million in 2000, a compound annual growth rate in excess of 30 percent. Source: Covad's latest 10-K.

- IP telephony revenue – otherwise known as Voice-over-IP, VOIP, or the integration of voice and data on a single network – is projected to exceed $2 billion in 2003. Source: Jupiter Communications

- Cisco Systems Inc. handles 78 percent of all its orders over the Internet and never even touches half, or $4 billion, of them. Cisco develops product manufacturing, and testing specifications, but by using the Internet, the orders shoot directly to contract manufacturers. Cisco owns only 2 of 30 plants producing its network switches and routers. Source: E-Biz Business Week October 4, 1999

- Transaction volume in the B2B space is estimated to be 10 times the size of B2C market within the next year or two. Recent US economic data suggests that retail e-commerce (B2C) now represents only about 1percent of total retail sales. B2B volumes will be much higher. The complexities are also much greater. B2B commerce is generally projected to grow from about 150 billion in 1999 to 7 trillion over 5 years. Source: Forbes April 11, 2000

- Intranets and extranets are still rare. Only about 7 percent of US organizations have an intranet (a private, internally accessible Web site), and only about 5 percent report an extranet (a Web site accessible by external organizations such as business partners but not the general public).

  Intranets are more common among large establishments: 6 percent of small sites, 33 percent of medium sites, and 52 percent of large sites have an intranet.

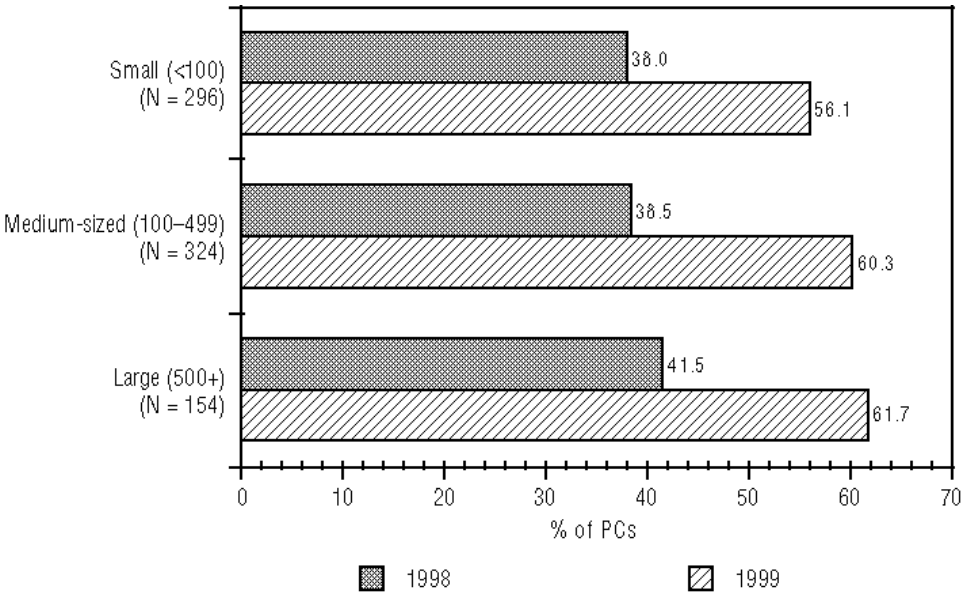
  More than 70 percent of all US computerized establishments have access to the Internet/World Wide Web today. Approximately 38 percent of all PCs were on the WWW in 1998, and 57 percent of all PCs will be on the Web by the end of 1999.

  Just over one-third of US computerized establishments have a company home page. Company home pages are more prevalent among large establishments, where 84 percent report the existence of a home page.

  Home page activities are still focused on delivering product information and customer services/support, while sales transactions are offered by only a fraction (approximately 17 percent). IDC Predictions 2000 Bulletin #W21342- December 1999-IT Research

US Business Site PCs on the World Wide Web by Establishment Size, 1998 and 1999

Q30. Approximately how many of the following end-user devices are currently in use at your site?
Q31. How many personal computers (both IBM-compatible and Apple) do you expect to acquire in 1999? (Include both desktop and portable PCs.)
Q40. What percent of your site's PCs access the World Wide Web now?
Q41. What will this percentage be at the end of 1999?



US Business Site PCs on the World Wide Web by Industry, 1998 and 1999

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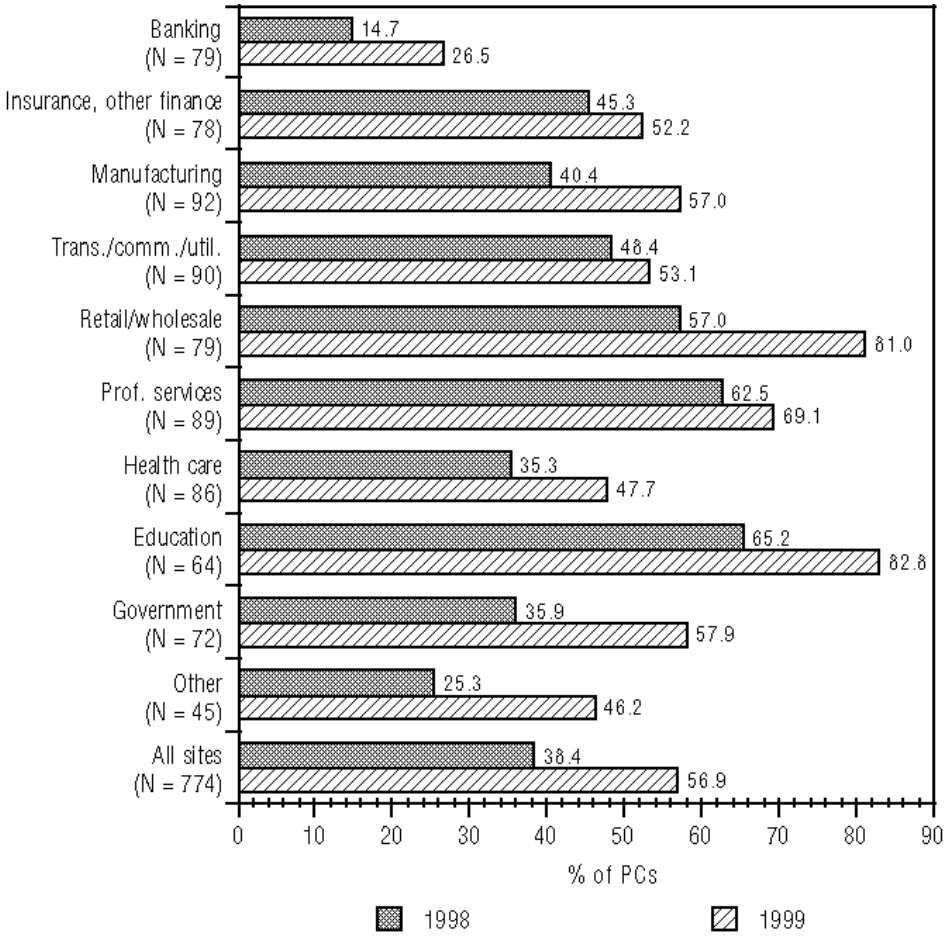
Q40. What percent of your site's PCs access the World Wide Web now?
Q41. What will this percentage be at the end of 1999?



The US Segment of the 1999 Global IT Survey
Carol Glasheen Report #W18557 - April 1999 – ITResearch

Layer 2: The Internet Applications Infrastructure Indicator

INTERNET GROWTH

- In 2000, B2B transactions will account for 77 percent of worldwide ecommerce. There will literally be thousands of sites competing to become the key marketplaces for business buyers. Source: IDC Predictions 2000 Bulletin #W21342- December 1999-IT Research

- The market for B2B E-commerce is already much larger than that for business-to-customer (B2C) transactions and it is predicted to grow much more rapidly. In the book, B2B Exchanges: The Killer Application in the New Business-to-Business Internet Revolution, the authors estimated now much of this B2B Internet commerce will pass through B2B exchanges in the US They predict that on-exchange transactions will exceed $600 billion in value (30 percent of the total) by 2004 in the US alone: if B2B exchanges can capture revenues representing just 0.5 percent of this turnover, they will collectively generate $3 billion in revenue per annum by 2004 - and that excludes the rest of the world. Since the book was published, the Gartner Group has supported these estimates by predicting that global B2B e-commerce will reach $7.29 trillion by 2004 and that 37 percent of this will be facilitated by B2B e-markets. Source: "Growing Number of B2B Exchanges in Europe Expand New Business-to-Business Net Market Models" Business Wire, Thursday, May 11, 2000.

- Forrester Research estimates that US-based Internet commerce between companies will grow from $109 billion in 1999 to $1.3 trillion in 2003. Forrester Research further estimates that by 2003 this market for business-to-business transactions will be more than ten times larger than the related business-to-consumer transactions market.

- According to Forrester Research, business-to-business electronic commerce is expected to account for more than 90 percent of the dollar value of electronic commerce in the United States by 2003. This market is expected to create a substantial demand for Internet-based electronic commerce applications. According to International Data Corporation, the worldwide market for Internet-based electronic commerce procurement and order management applications alone is expected to experience tremendous growth, increasing from $187 million in 1998 to $8.5 billion in 2003.

- The overall electronic support marketplace will grow from $1.9 billion in 1998 to $10.4 billion in 2002, representing a growth rate of 47.5 percent per year. Growth rates by the year 2002 for remote diagnostics are predicted at 31.5 percent and growth rates for predictive and preventive maintenance are at 40.1 percent. Industry estimates of downtime costs to enterprise range up to $13,000 per minute. Source: IDC

- The information access segment of the data warehousing market alone is estimated to be growing from $664 million in 1996 to $1.4 billion in 2000. Source: IDC, cited in Information Advantage's 10-K

- The market for Web application servers will triple from $692 million in 1999 to $2.1 billion in 2002. Source: Forrester Research, cited in Allaire's S-1

- The market for e-business applications will grow from $1.7 billion in 1999 to $13.2 billion in 2003. Source: IDC, cited in Allaire's S-1

- Worldwide demand for Internet professional services is expected to grow from $7.8 billion in 1998 to $78.5 billion in 2003. Source: IDC, cited in agency.com's S-1

Internet-services mammoth USWeb/CKS reportedly has seen its average contract size blast off from $100,000 to nearly $2.5 million in the past year. But $2.5 million contracts don't shock industry analysts, with many claiming that figure is somewhat conservative. Moshe Katri, managing director at SG Cowen, says that the six-digit or million-dollar Internet-services deals of early 1999 are quickly jumping into the $4 million to $10 million range today. Forrester Research concurs, predicting a whopping 60 percent annual growth for e-commerce and Internet services, with the market climbing to $33 billion by 2002. http://www.zdnet.com/sr/stories/e_biz/0,4934,2304292,00.html

- In July 1999, there were about 56 million IP addresses. As of January 2000 that number has grown to over 72 million. Source: EDS Financial Industry, Industry News April 25, 2000

- The Internet is currently expanding at the average rate of 69 new hosts per minute and 23 new domains per minute. Based on current growth, the 100 million-host level will be reached the last quarter of this year. And there will be 1 billion hosts in 2005. Source: EDS Financial Industry, Industry News April 25, 2000.

DOMAIN NAMES

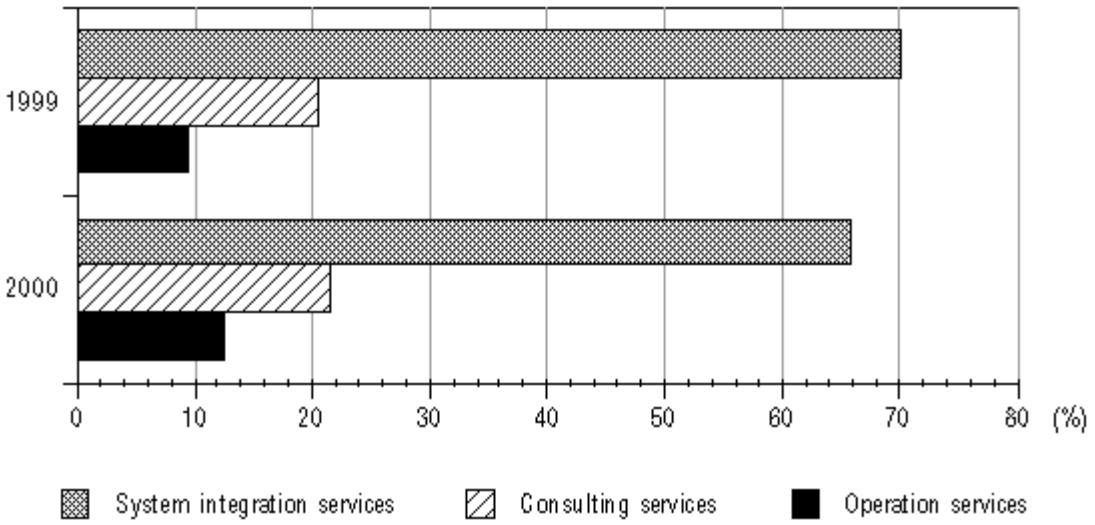
- Last November, Network Solutions lost its government-sanctioned monopoly over a building block of the New Economy: the registration of Internet addresses ending in .com, .net, and .org. Approximately 30 companies compete for the business of doling out Web addresses to retail customers--and nearly 120 others are ready to jump in. Experts say there will be plenty of business to go around as everyone from the local taxidermist to multinational corporations clamors for a Web address to hang out as an e-commerce shingle.

- Investment bank Chase H&Q estimates that registrations in .com, .net, and .org will explode, to more than 6 million this year from 100,000 in 1995--and should top 18 million by 2002.

- To minimize disruption to the Net, the government has allowed Network Solutions to remain the sole operator of the central database of all .com, .net, and .org addresses. Under the current contract, competitors pay Network Solutions $6 per year for each name they log. That helped the company earn a $26.9 million profit last year on $220.8 million in revenues. Source: Business Week, March 13, 2000

SERVICES MARKET

What percentage of CY 1999 and CY 2000 Internet service revenue will come from the following service types?



Internet and E-commerce Services Market: A Competitive Segmentation and Analysis for the Year 2000 Meredith McCarty Whalen, Pooneh Fooladi
Report #W21016 - December 1999- ITResearch

Layer 3: The Internet Intermediary Indicator

ADVERTISING INDUSTRY

- The Internet Advertising Bureau (IAB) estimates total ad spending on the Internet reached $1.5 billion in 1998, less than 1 percent of total ad spending in the US We expect this to grow tenfold over the next ten years to $14.0 billion, putting it within the same range as radio, magazines, and the Yellow Pages in terms of size.

Web Ad Spending

Year	$ Millions	% Chg YoY
1997	906	--
1998	1,500	65%
1999E	3,000	100%
2000E	4,500	50%
2001E	7,000	55%
2002E	10,000	43%
2003E	14,000	40%

US Total Advertising Spending

Medium	$ Millions	% of Total
Television	47,900	23.4%
Newspapers	44,800	22.1%
Direct Mail	39,100	19.3%
Radio	14,500	7.2%
Yellow Pages	12,300	6.1%
Magazines	10,500	5.2%
Outdoor	1,500	0.7%
Web/Interne	1,500	0.7%
Other	30,200	14.9%
Total	202,300	100%

The Internet Data Services Report –Morgan Stanley - September 1999 part 1

FINANCIAL INDUSTRY

Stock Brokerages

- Goldman Sachs traders are assisted by some of the most sophisticated Information Technology in the world. Traders still make many decisions, but computers make more and more of them. Secret algorithms guide 20,000 trades a day in the volatile equity derivatives market. Trade prices are updated 200 times per second and 100 million deals are executed without any human intervention. Source: Forbes May 15, 2000

- The rise of online stock brokerages has accelerated the decline in the cost of trading. Now two new e-brokers want to convince investors that they can trade stocks for free. The brokerages are banking on the notion that customers who believe they can have something for nothing will flock to these services in droves. Once this happens, the revenue from ancillary sources will naturally follow. “Free trading is not a standalone long-term business model”, Chase H&Q, “It’s just a hook to get revenues in some other way. Source: The Industry Standard May 15, 2000

Banking

- The banking industry's average cost per transaction is 1 cent on the Internet, vs. $1.07 at a branch, 54 cents on the phone, and 27 cents at an automated teller machine, according to Merrill Lynch. A recent Microsoft study estimates that switching the mortgage-origination process to a full-service Web-based electronic business could eliminate two of the three percentage points people currently pay in closing costs. Forrester Research Inc. expects online mortgage loans will grow from $18 billion in 1999 to more than $91 billion in 2003. Source: The Industry Standard May 15, 2000

- IDC predicts that more than 32 million households in the US will be banking online by 2003 Source: EDS: Financial Industry: Industry News April 25, 2000

- The Federal Deposit Insurance Corporation says that of the 10,271 banks in the US – 10, 045 of which are small, regional banks with total assets of $3 billion or less – only 1,270 offer online transaction banking. Source: The Industry Standard, May 15, 2000

- Gartner Group reported that, as of October 1999, 18 million adults in the US were banking on the Internet – a 200 percent growth in just a year and a half. By 2004 the number of people banking online – doing transactions checking balances, transferring funds is expected to jump to 38 million. Source: The Industry Standard, May 15, 2000

- A 1999 study by Forrester Research found that just 10 percent of US account-holders were banking online, and only 2 percent of US households were paying their bills online. Online loans and insurance- both complex and infrequently purchased products- showed an adoption rate of less than 1 percent.

  As more people come online, there will no doubt be an upswing in services. McKinsey & Co. estimates that in 2002 online financial services will constitute 10 percent of the $400 billion in gross revenue that the financial services industry will take in. That’s up from just 1 percent to 2 percent of the industry’s $340 billion in revenue in 1999.

  More compelling McKinsey and other firms believe that online trading won’t hold a candle to other online personal financial services in the future. Deutsche Banc Alex. Brown estimates online trading will generate $5 billion in annual revenues in 2002. But online insurance sales are expected to score revenues of $19 billion a year, followed by e-banking and e-payments, with $11.5 billion and $9 billion respectively. Source: The Industry Standard May 15, 2000

- “Account aggregators” or “screen scrapers” enable consumers to view their banking investment and billing statements in one place on the web, regardless of where the accounts originate. The problem from the bank’s point of view is that aggregators typically collect information without

permission from the various financial institutions. Essentially they log on as the customer, extract data and head for home.

The aggregate business sprouted virtually overnight. About 10 aggregators now do business on the web, and an untold number of banks, brokerages and wireless carriers are getting into the act.

While only about 800,000 consumers will use aggregation services this year, according to Cambridge, Mass, consultancy, that number should reach 4 million by 2002. Source: The Industry Standard May 15, 2000

Bills & Mortgages

- Barely 2 percent of consumers pay their bills online, even though surveys indicate people want e-bills. A 1999 study conducted by AOL and Roper Starch Worldwide found that 55 percent of online consumers are interested in paying bills online. The potential payoff for billers and processors is huge. US consumers get 18 billion bills every year, and offline billers pay 50 cents to $2 to process and distribute each one. E-bills average just 35 cents to 50 cents a piece. All told, companies issuing e-bills will reduce their costs by $8 billion next year, according to Killen & Associates. Source: The Industry Standard, May 15, 2000

- Mortgage Bankers Association of America predicts only 1 percent of the $972 billion that Americans will borrow this year for residential mortgages will originate online. Forrester research predicts online mortgages will reach approximately 10 percent of total mortgage borrowing by 2003. Source: The Industry Standard, May 15, 2000

WEB TALK REVENUE FORECAST MODELS

- Web talk service provider revenue will increase at a compound annual growth rate (CAGR) of 200 percent, from $208 million at the end of 2000 to $16.5 billion by yearend 2004. Web talk service providers can participate in four different revenue sources:
    1. Advertising that is structured around the Web portal model of cost per thousand viewers, or CPM
    2. Premium services that use a monthly subscription or pay-per-use model
    3. E-commerce fees derived from a percentage or commission of gross sales
    4. Hosted services that use a pricing metric based on either peak simultaneous users or the number of customer service seats that are Web talk enabled
- In 2000, the bulk of revenue will be generated from premium services (46 percent) and advertising (31 percent), followed by hosted services (15 percent) and ecommerce fees (8 percent). The fastest-growing revenue sources are:
    1. Advertising, which will jump from $65 million in 2000 to $6.5 billion in 2004
    2. Hosted services, which are projected to soar from $31 million in 2000 to nearly $3.5 billion in 2004
- The revenue mix shifts over time, from premium services representing 83 percent of the 1999 market to an almost equal contribution between advertising and premium services in 2004.

Source: Web Talk 2000: Market Forecast and Analysis Mark Winther Report #W22019 - April 2000 ITResearch

Layer 4: The Internet Commerce Index

DOMESTIC AND INTERNATIONAL E-COMMERCE

- The time has come for business-to-business (B2B) product companies to stop making excuses about not selling overseas. The longer E-commerce companies put off the effort, the more market share and revenue they will lose. This year, 53 percent of worldwide ecommerce is being conducted in the United States; by 2003, that number will be down to 44 percent and getting smaller. IDC's *Project Atlas* shows this trend in action: In every region surveyed outside the United States, Internet buyers made at least 40 percent of their purchases from Web sites in their home countries. Source: IT Research, March 2000

ECOMMERCE GROWTH

- Based on its Internet Commerce Market Model™ described and documented in other chapters, IDC forecast continued growth in Internet and World Wide Web use around the world.

The number of users who buy and sell goods and services over the World Wide Web increased to 142 million users in 1998 and is forecast to reach almost 200 million by yearend 1999 and to surpass 500 million users by 2003. This increase in use will drive commerce on the Internet to more than $1 trillion by 2003, reflecting a 1998-2003 compound annual growth rate (CAGR) of 92 percent.

In 1998, the number of devices used to access the World Wide Web was 150 million; by 2003, the number of Web devices will increase to more than 720 million.

The percent of users buying goods and services on the Web will grow modestly -- from 22 percent in December 1998 to 36 percent in December 2003, but given the increase in users, the actual number of Web buyers will expand from 31 million in 1998 to more than 183 million in 2003.

As a result of the increase in the number of "buyers" on the Web, the average transaction size, and the adoption of the Web as a viable vehicle for business procurement, the amount of commerce conducted over the Web is expected to grow dramatically -- to more than $1 trillion during 2003. Source. The Global Market Forecast for Internet Usage and Commerce: Based on Internet Commerce Market Model, Version 5 Carol Glasheen, John Gantz

Report #W19262 - June 1999 - ITResearch

INTERNET USAGE AND COMMERCE BY SEGMENT

- Along with regions, version 5.1 of IDC's Internet Commerce Market ModelTM forecasts global Internet and Web usage and commerce within the following market segments:

· Home (including home office)

· Small business (1-99 employees)

· Medium-sized or large business (at least 100 employees)

· Government (federal, state, and local)

· Education (K-12 and higher education)

· More than half of all Web users access the Web from both home and work or school.

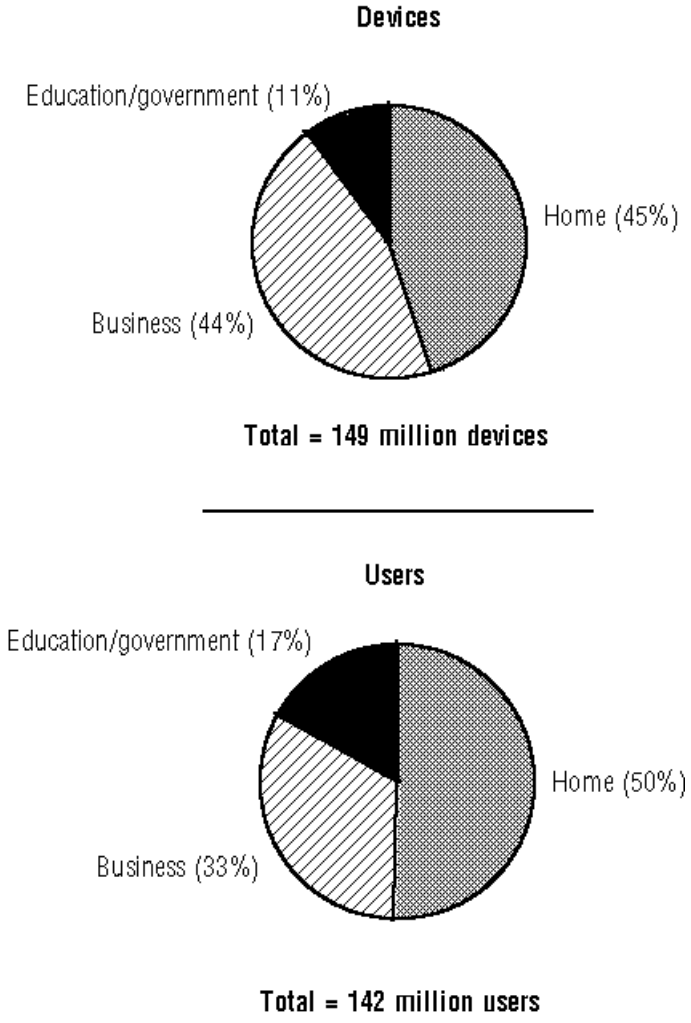
At first glance the number of home users seems high, but consider the following:

· Household users share PCs and Web access. In the United States, the model assumes 2.0 users per Internet household and 1.8 devices (1998) per household.

· Most home computers (at least in the United States) are being shipped with modems and easy Internet registration -- more so than business PCs.

· Business users often have access to the Internet for email -- but not for Web access. Some companies actively limit the amount of Web access available for users.

Figure 5 - World Wide Web Devices and Users by Segment, Year-end 1998



However, while the home segment makes up half of all Web users, it accounted for only 30 percent of Internet commerce in 1998 and is forecast at 20 percent in 2001. This downward trend is expected to continue as businesses purchase more goods electronically and as business-to-business transaction sizes increase

The Global Market Forecast for Internet Usage and Commerce: Based on Internet Commerce Market Model, Version Carol Glasheen, John Gantz
Report #W19262 - June 1999 – ITResearch

RETAILERS ON LINE

- More than 400,000 companies have hung www.shingle.com atop their digital doorways with the notion that being anywhere on the Internet means they can sell virtually everywhere. And sure enough, sales are picking up: Goods and services sold online to US and European consumers this year will top $5.1 billion--more than double the 1997 figure, according to Forrester Research Inc. Source: E-Biz Business Week 5/8/00

- There's a lesson here for brick-and-mortar retailers rushing to the Web. Adding an e-commerce site to an established retail and catalog business will not necessarily provide a quick lead to a sales boom. "It's not just a matter of 'if you build it, they will come,'" says James W. Vogtle, director of e-commerce research for Boston Consulting Group. Source: Business Week. March 20, 2000

- For even the savviest direct marketer, consumer behavior on the Web remains uncharted territory. The ability to mine and track customer data, doesn't necessarily translate into a quick payoff online. With e-commerce in its infancy, "accurately forecasting demand is almost impossible," says Vogtle. Source: Business Week. March 20, 2000

- Forrester Research has added its voice to the chorus of e-skeptics that have been hammering Internet retailers of late, having issued a report that predicts the demise of most Internet only retailers by the end of next year. “The combination of weak financials, increasing competitive pressures, and investor flight will drive most of today’s dot-com retailers out of business by 2001” according to a statement issued by the Cambridge, MA-based research company. Forrester is predicting that B2B e-commerce consolidation will come in 3 waves.

1) First, companies that have been successful selling products such as books and software online will start merging by this Fall.

2) Second, online merchants selling low margin “undifferentiated products” such as electronics and toys “will collapse before marketing expenditures ramp up for the next holiday season”.

3) Finally, merchants selling heavily branded products such as apparel will be stable until 2002. Source: Info World April 12, 2000

PET SUPPLY INDUSTRY

- Within the past year, more than a dozen major pet supply sites have popped up, including some backed by powerhouse players Amazon.com (AMZN), cable television's Discovery Communications, and the nation's two largest pet supply chains, PETsMART (PETM) and Petco Animal Supplies (PETC). The appeal? A market bigger than either toys or music. Americans spend $23 billion on pet food and supplies, according to the American Pet Products Manufacturers Assn. And while pet owners plunked down just $299 million of that online last year, the Web market for pet goodies is expected to hit $2.5 billion in 2002, says Forrester Research Inc.

Because so many pet stores are rushing to the Web, the market is almost certainly headed for a messy shakeout. Pet supplies have never been a lucrative business. "A lot of these companies are going to get eaten up," says Forrester Research analyst Carrie Johnson. "Only the sites with the best-known names are going to win." Source: Business Week March 6, 2000

WEB DEMOGRAPHICS

Table 1 - Women on the Web at a Glance, Worldwide

Number surveyed	5,561
Average age	36
Hours per week online	17
Percentage who are Web buyers	58%
Amount spent per month on Web buying	$64
Favorite products	Books/magazines, software, and travel

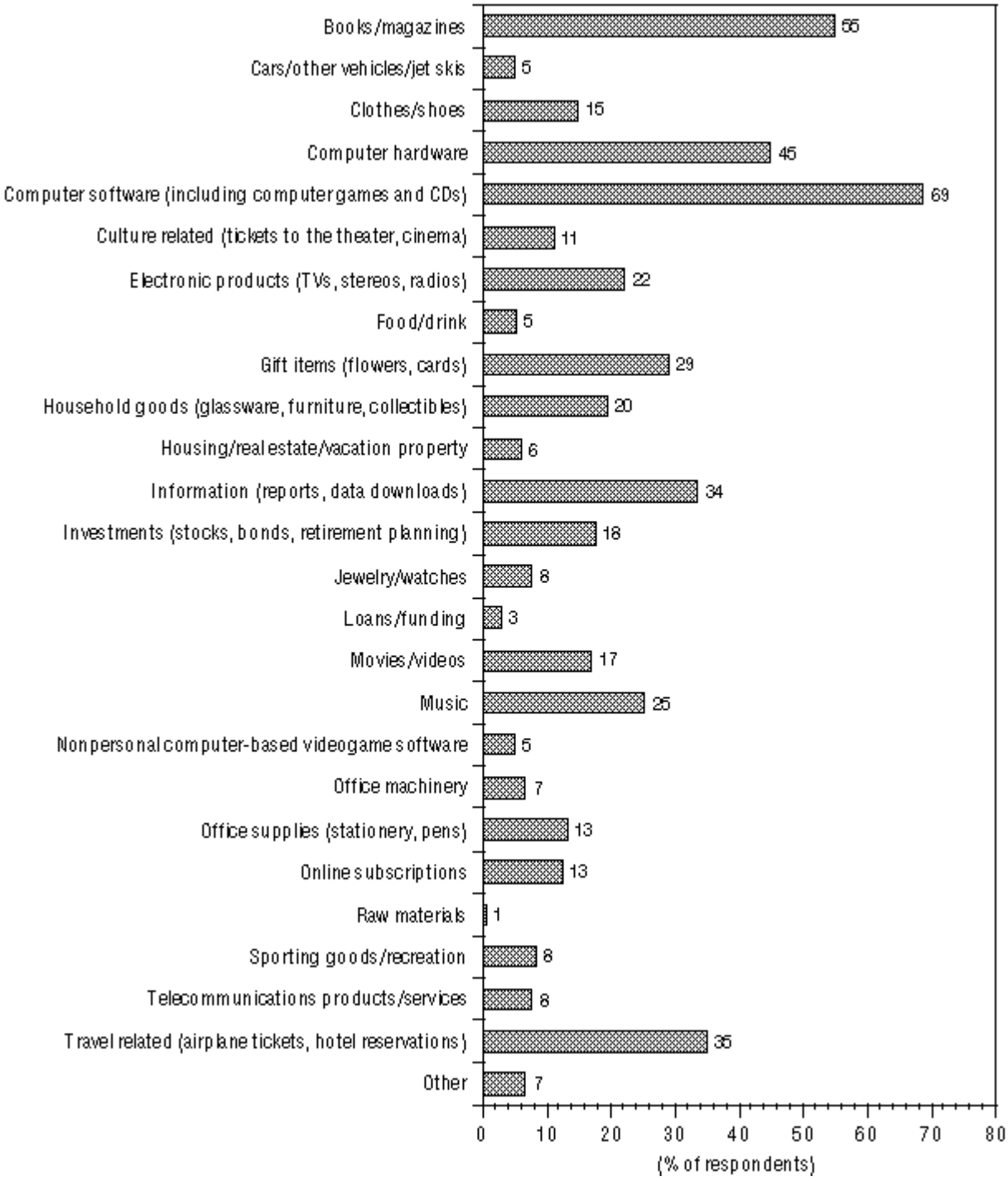
	Worldwide	United States
Average age	36	39
College graduate or more	82%	84%
International travel in the last 12 months	49%	35%
Hours per week online	17	19
Fees for monthly access	$25	$24
Access from home	85%	91%
Primary access from home	62%	71%
Access from work	58%	58%
Primary access from work	30%	24%
Slow-speed access (<56Kbps)	21%	20%
56Kbps access	48%	52%
Always on (e.g., ISDN/DSL/cable)	15%	12%
Percentage who are Web buyers	58%	66%
Average age of buyers	38	40
Hours per week online by buyers	19	20
Amount spent online per month	$64	$69
Top 3 products	Books/magazines, software, and travel	Books/magazines, software, and travel

Target: Women on the Web -- Their Internet Usage and Buying Habits
Seana Dowling Bulletin #W22102 - May 2000 – ITResearch

Table 2 - Retirees on the Web: Worldwide Versus US Statistics

	Worldwide	United States
Average age	64	64
College graduate or more	80%	78%
International travel in the last 12 months	46%	37%
Hours per week online		21
Fees for monthly access	$25	$24
Access from home	99%	99%
Primary access from home	98%	99%
Access from work	6%	7%
Primary access from work	1%	0%
Slow-speed access (<56Kbps)	22%	21%
56Kpbs access	61%	65%
Always on (e.g., ISDN/DSL/cable)	11%	6%
Percentage who are Web buyers	57%	63%
Average age of buyers	63	63
Hours per week online by buyers	20	22
Amount spent online per month	$48	$54
Top 3 products	Computer software, books/magazines, and computer hardware	Computer software, books/magazines, and computer hardware

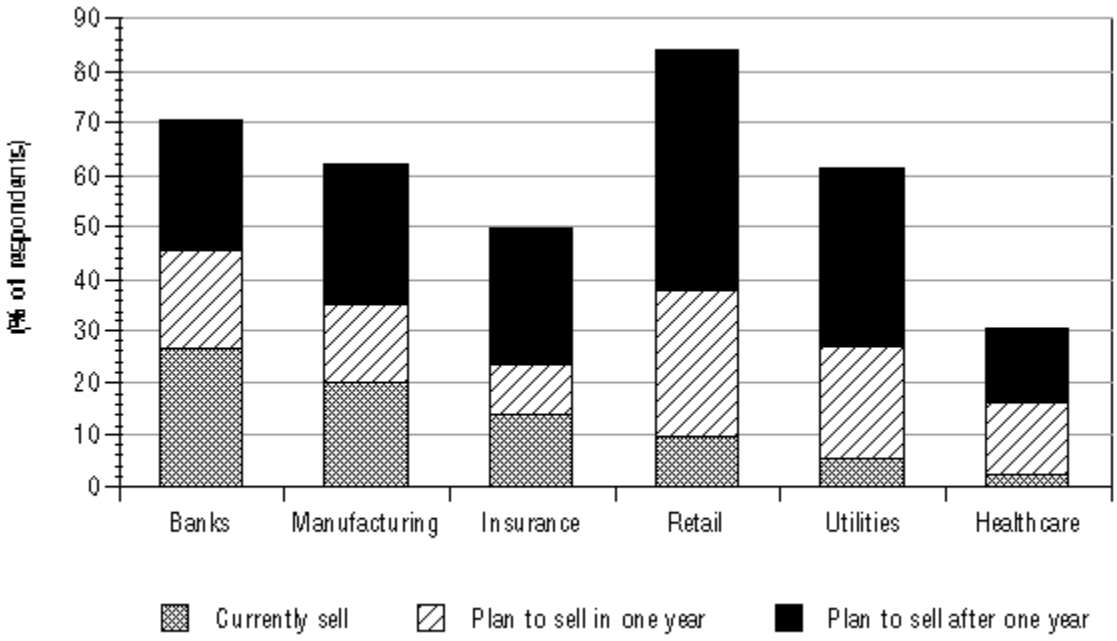
Retirees on the Web: Products Purchased, United States



Target: Retirees on the Web -- Their Internet Usage and Buying Habits
Seana Dowling Bulletin #W22102 - May 2000 – ITResearch

Figure 3 - Industries' Activities and Plans on the Internet

Q. Do you sell or plan to sell on the Internet?



By 2003, 30-50% of ecommerce will take place outside normal business hours

Success Strategies for the New Internet Economy
Frank Gens Bulletin #W20529 - October 1999 ITResearch

Appendix E: Frequently Asked Questions

Q. What is the Internet Economy?

The Internet Economy is made up of companies directly generating all or some part of their revenues from Internet or Internet-related products and services. These companies are the Internet infrastructure and Internet applications players, such as Cisco, Dell, IBM, HP, Oracle, Microsoft and Sun, whose products and services make it feasible to use the Internet for electronic commerce. For example, IBM sells servers and PCs that are used to gain access to the Internet. Similarly, 3Com sell modems and Cisco sells routers, all used to gain access to the Internet. The Internet-related revenues from these companies, for example, are included in the estimates for the entire Internet Economy.

Then there are companies selling products and services over the Internet. This includes pure Internet based sellers like Amazon.com and eToys.com as well as bricks-and-mortar companies, such as LL Bean and Alaska Airlines, who are also conducting a part of their business on the Internet. Further, electronic intermediaries or Internet middlemen, such as eBay or EGroup, who act as catalysts by facilitating the interaction between buyers and sellers. So the overall Internet Economy is made up of the revenues of infrastructure and applications players, electronic intermediaries and online sellers.

It is important to point out that the Internet Economy is not just a collection of 'high-tech' companies. It includes any company that generates revenues from the Internet. For example, a part of the revenues generated by traditional telecommunications companies are counted in this economy since they carry IP traffic over their miles and miles of copper, coaxial and fiber lines. We did not, however, count all revenues from all technology companies. Not even 100 percent of Cisco's revenues were considered to be part of the Internet Economy, since all networking devices are not attached to the Internet.

Q. How did you measure the Internet Economy?

There were two important steps to how we measured the Internet Economy. The first was to develop a conceptual framework and taxonomy for attributing revenues and employees in the Internet Economy. Since the manner in which businesses operate in the Internet Economy can vary substantially, we decided to group companies based upon core business activities.

The Internet can be thought of as a network of networks, made up of many component parts. This may consists of networking hardware, networking software, servers, PCs, Web software, Web designers, Web operators, and the companies that are actually doing business one the Web. There is a natural structure or hierarchy to the Internet that can be directly traced to how businesses generate revenues. Based upon this type of structure, we use the following four-layer architecture to group companies, revenues and employees. We call these four layers, the Internet Economy Indicators.

Layer 1: The Internet Infrastructure Indicator—The gross revenues and attributed employees from companies that manufacture or provide products and services that make up the Internet network infrastructure. This layer includes companies that provide

telecommunications and fiber backbones, "last mile" access, Internet dial-up access and end-user networking equipment necessary for the proliferation of Internet based Electronic Commerce (EC). It also includes PC and server manufacturers, modem manufacturers and other manufacturers of hardware necessary for the Internet to function.

Layer 2: The Internet Applications Indicator—The gross revenues and attributed employees from companies that provide electronic commerce applications (e.g., Netscape, IBM, Microsoft, Sun), Internet consulting services (e.g., USWeb/CKS, Scient), multimedia applications (e.g., RealNetworks, Macromedia), Web development software (e.g., NetObjects, Allaire, Vignette), search engine software (e.g., Inktomi, Verity), Web-enabled databases (e.g., Oracle, IBM DB2, Microsoft SQL Server, Sybase, Informix), and online training services (e.g., Sylvan Prometric, Assymetrix). This also includes consultants who define and develop Internet applications for their clients (e.g., Ernst & Young, EDS) and the integration of Internet applications with other IT/enterprise platforms (e.g., IBM, Compaq, Andersen Consulting). Products and services in this layer build upon the network infrastructure and make it technologically possible to perform business activities online.

Layer 3: The Internet Intermediary Indicator—The gross revenues and attributed employees from companies that increase the efficiency of electronic markets as Internet middlemen by facilitating the meeting and interaction of buyers and sellers via the World Wide Web and Internet. This layer includes online brokerages, Internet ad brokers (e.g., Doubleclick, 24/7 Media), portals/content providers (e.g., Yahoo, Excite, Geocities), market makers in vertical industries (e.g., VerticalNet, PCOrder), content aggregators (e.g., Cnet, ZDnet, Broadcast.com), and online travel agencies.

Layer 4: The Internet Commerce Indicator—The gross revenues and attributed employees from companies that generate product and service sales to consumers or businesses over the World Wide Web and Internet. This layer includes online retailing, pay-to-use content and other business-to-business and business-to-consumer transactions conducted on the World Wide Web and Internet.

The second step we took to measure the Internet Economy was the actual data collection methodology. In-depth research was conducted on companies that participate in one or more of the four layers of the Internet economy. Phone-based interviews were conducted with 2600 of the smaller Internet players, and 345 in-depth interviews were conducted with the largest companies playing in the Internet Economy. For the largest companies, we analyzed company annual reports, product literature and web sites for to develop a solid understanding of how they fit into one or more of the four layers. Universe estimates for Internet companies were developed from several Web-based databases and final Internet Economy revenues were estimated using a combination of enumeration and statistical sampling and projection techniques.

Finally, extensive secondary research was used and included reports from IDC, Dataquest, Forrester, Dell'Oro and many other research firms. The World Wide Web proved to be the most effective source of information on companies involved in the Internet economy.

Measurement Related Questions

Q. How did you handle researching companies that had mergers and acquisitions between Q1 1999 and Q4 1999?

When this occurred we counted the company information as if the companies had existed in the end state for both periods. This way we could provide a consistent comparison. In some cases these mergers caused revenue to leave the Internet Economy (when a US-based company was sold to a non-US firm, we did not continue to count the revenue after the sale; on the other hand, when a US-based firm buys a foreign company, we counted the incremental revenue in the Internet Economy only for the period in which the revenue was a holding of a US-based company.

Q. What accounting rules were used to assess the revenues of large holding companies whose subsidiaries are Internet focused?

Standard accounting rules and procedures were used to evaluate these revenues. In most cases, this meant that if more than 50 percent of the voting shares of an Internet company is owned by the parent company, that share of revenue and related expenses are included in the consolidated statement of the parent company. This allowed us to discern in many cases how much revenue was relevant for analysis, and to avoid double-counting revenues in both the original company and the parent.

In some cases revenue was not reported according to these rules, so we needed to adjust the revenue accordingly. For example in some cases 100 percent of the revenue was reported in both the parent statement and the Internet company. In these instances we assured that it was only counted once.

Q. Are the estimates restricted to the U.S?

The estimates are based on the worldwide Internet-related sales of US-based companies in Q1 1999 and Q4 1999. Cisco's foreign Internet sales are included in this number because Cisco is a US-based company. We took a conservative approach to revenue inclusion.

Q. Do the Indicators include measurements of Internet usage by number of users or volume of traffic?

The Internet Economy Indicator does not measure Internet activity by user or volume of traffic, but measures Internet activity from a revenue and employee perspective. It is thus a supplier-side data collection approach rather than a demand-side approach.

Q. How accurate is the estimate of the Internet Economy?

Based upon our four-layer taxonomy, we believe that the estimates for each layer are very accurate. To compile our estimates, we completed research on over 2,600 US based companies that currently operate in the Internet Economy. In addition, we estimated revenues and employees from 350 of the largest technology companies by reviewing annual reports, researching company web sites and product/service offerings and calling to solicit estimates of Internet revenue from the companies directly. Finally, we leveraged existing market data that included secondary research reports from Morgan Stanley Dean

Witter, IDC, Dataquest, Forrester, Del'Oro, Cahners In-Stat, IntelliQuest and many other technology research firms.

Q. How are the four indicators combined into one employment number and one revenue number?

The four indicators are combined into one number by estimating and eliminating the overlap and double counting of revenues across all four layers.

Q. Are the Internet Economy Indicators comparable to GDP or GNP?

It is not a straight comparison. The gross domestic product or gross national product is based on value of goods and services produced in the US, minus any direct or indirect taxes. The Internet Economy Indicators only measure total revenues and jobs. Our long-term goal is to create an index that mirrors GDP.

Q. What if a company generates revenues in more than one indicator layer? Are the revenues broken out by layer?

Yes, but there is a complexity in terms of assigning revenues and employees to each layer, since companies don't report revenues or employees this way. Across the board we were faced with the challenge of identifying what portion of a company's revenues were Internet-related. For some companies, it was simple because they were pure Internet companies. Companies like Amazon.com, Vignette, eBay or NetObjects are all 100-percent Internet companies. In addition, many of these Internet 'pure-plays' only operate within one of the Internet Economy layers.

For other companies, attributing revenues to the Internet was much more complicated. These companies are not 100 percent Internet companies, and they generate revenues in more than one of the Internet Economy layers. For example, IBM generates revenues in the infrastructure layer one from its ISP business as well as from PC, server and networking equipment. In the applications layer, IBM generates revenues from its E-business software and consulting services. In the Internet commerce layer, IBM generates revenues from its ShopIBM.com commerce site.

For companies playing at multiple layers, in any layer we only count revenues that are attributable to products and services in that layer. In order to combine the revenues across all layers, we take out the Internet commerce revenues for players whose products/services are counted at infrastructure and/or applications layers and who also sell some or all of these online.

Q. Does the estimate of the number of employees include Internet-related employees at non-Internet companies?

Yes. The research did not focus solely on 100-percent Internet companies, or companies that generated 100 percent of their revenues from the Internet. We looked at all companies that were generating all or some part of their revenues from Internet or Internet-related products or services. Therefore we counted Internet-related employees from traditional bricks-and-mortar companies like Barnes & Noble or Lands End.

Q. Is it double counting to include finished PC's and servers as well as their operating systems? Won't the value of the operating systems (with a mark-up) be reflected in the price of the box?

Yes. For example, we only counted revenues associated with servers and desktops leaving out operating systems. Similarly we did not count OEM modems, as they are a part of the PC, and took care to consider branded modems that are sold separately. In addition, microprocessors, memory, disk drives and other OEM components are counted in the PC or server, but taken out of the revenues of their original manufacturers. An exception to this is the Electronic commerce revenue of these OEM manufacturers, which are counted in Layer 4, but not in Layer 1.

Q. How do you account for the revenues from computer manufacturers? Do you count all of their revenues?

No. Since we know that not all home PCs are purchased and used for Internet access and because we know that not all corporate PCs have access to the Internet, we adjusted the revenues attributed to the Internet Economy based upon the estimated percent of PCs sold in Q1 1999and Q4 1999 that were purchased for Internet access.

For example, we know from IDC research estimates that approximately 90 percent of all PCs purchased for the home in 1999 are being used for Internet access. In the corporate world, that estimate is approximately 60 percent of all PCs purchased. Therefore, we accounted for PC revenues using the percentage of those PCs that were used for Internet access.

Q. Are there examples of companies who have revenues from a product or service counted in more than one layer? If so, how do you account for this in the total number without double counting?

Yes, there are companies that have revenues counted in more than one layer. For example, adjusted revenues from Dell Computer's sales of PCs are included in the infrastructure layer and are also accounted for in the Internet commerce layer due to online PC sales. When we estimate the total revenues from the Internet Economy, we remove from the commerce layer the double counted revenues for any company that also has revenues from the same product or service in the other layers.

Q. Explain how this is a global study.

It measures the worldwide revenues of US-based companies.

Q. How did you handle changes in data collection and/or research methodology compared to the previous phase of the project?

In the current study, the data is collected quarterly, so we gathered comparisons of Internet revenue in Q1 1999 and Q4 1999, along with Internet employees during this same period. Over time, the estimates can be updated quarterly and annual totals derived. It is expected that each phase will engender improvements in the availability of Internet revenue information and better information on the companies participating in the Internet economy.

Q. How did you define your universe?

Based on our knowledge of the types and categories of companies that make the Internet possible, we began compiling a list of the companies that we know participate in the Internet Economy. We operated on the following premise: If you are participating in the Internet Economy, you had better be on the World Wide Web.

Using that premise, the Web was used to build a database of companies that participate in the Internet Economy. Using the layered conceptual model, we generated extensive lists from Yahoo, Excite, HotBot and other directory services. We searched through the lists to ensure that we did not miss the big players who may account for the larger share of revenues in a subcategory within a layer.

Using the "you've got to be on the Web" premise, we found an extremely valuable database of secure site URLs from a UK-based company called Netcraft. This database was used to create the universe estimate for companies conducting Internet transactions. This was the most appropriate and accurate sampling method to conduct the first large-scale supply-side estimate of Internet commerce revenues.

Q. Did you count 100 percent of the revenues from all networking equipment manufacturers?

No. Using available estimates of the percent of corporate PCs that are networked and were purchased for use on the Internet, we adjusted the actual revenues from networking equipment manufacturers attributed to the Internet economy. For example we know that approximately 50 percent of all PCs purchased for businesses in 1998 have Internet connectivity. Using these types of deflators we attributed networking equipment and Internet access device revenues as follows:
Routers: Consider 100 percent based on the premise that when these are deployed in LAN environments they are primarily being used as edge devices.
Dial access servers and concentrators: Consider 100 percent
ATM, Frame Relay switches and access devices: Consider 50 percent. ATM and Frame Relay systems carry significant non-IP traffic like SNA and IPX/SPX.
Layer 3 switches: Consider 100 percent given that they perform routing functions in a LAN environment.
Layer 2 switches: Consider 50 percent, based on the premise that 50 percent of the desktops purchased in the corporate environment in 1998 are connected to the Internet or an intranet.
Shared LAN hubs: Consider 50 percent (same logic as above)
NICs: Consider 50 percent (same logic)
Branded modems + modems only PC card: Consider 90 percent. Theoretically it could be 100 percent, but modems could be used to dial up to servers using some proprietary VAN.
ISDN equipment: Take 75 percent (similar logic as in modems)
Cable modems: 100 percent
CSU/DSU: Consider 25 percent, a relatively small percentage of Internet connectivity occurs through T-1s/fractional T-1s. Probably a very conservative estimate though.
xDSL: Consider 100 percent

Q. Why did you choose to measure sales revenue and employment? What's next? What will it take to create a proper index to measure this Internet economy?

Revenues are relatively easy to measure and understand, and is consistent with previous studies. Jobs are an equally important indictor, but are more difficult to measure because of the overlap between Internet and non-Internet jobs. To create an index comparable to GDP, we will have to measure value added within each of the layers. While it is an extremely complex task, it can be done with the help of sufficient resources and extensive data collection effort.

Q. What types of companies contributed most to the Internet Economy?

Given the nascent state of the Internet economy, it is not surprising that a few infrastructure players like Cisco, IBM, Sun, Compaq, Dell and Oracle contributed most significantly to the Internet economy. We expect this trend to continue; however, with the proliferation of the infrastructure, bricks-and-mortar companies selling products and services will most likely play an increasingly significant role at the commerce layer. For example, it is clear that the Internet revenue from companies like Wal-Mart, Citigroup, Sears, UPS, General Electric and other corporate giants will start to impact the Internet Economy and some of this impact even begins to show in the current study.

Q. What percent of the Internet Economy revenues is US versus worldwide?

The Internet Economy Indicators focused strictly on US companies and their total worldwide Internet-related revenues. The average breakout of US versus worldwide sales for some of the larger companies in the study is approximately 75 percent US and 25 percent non-US However, since the majority of the Internet Economy is made up of small privately held companies, a much larger portion of the revenue number is US based. We estimate the ratio at 83 percent US and 17 percent non-US.

Q. How much effort went into this research?

A large team of research experts from across the United States, using the Internet as a communications and research tool, combined to conduct the research.

The research team consisted of the professors and graduate students from the University of Texas at Austin Business School, research consultants from Cunningham Communications and outside research experts and analysts, including Dr. Brant Wilson of Customer Value Systems, Inc, a Houston-based marketing research and consulting company. In addition, primary research expertise was brought in from MarketVision Research, which specializes in econometrics based research. Jon Pinnell, the lead marketing scientist from MarketVision is a recognized expert in research in the technology industry and also in statistical sampling and modeling.