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The Determination of The U.S. Internet Users' Characteristics, Dynamic Preference Change and Rendering of The Leading Edge Internet Users By an Econometric Study

By

Aydogan Durmus

A dissertation submitted to the Graduate Faculty in Economics in partial fulfillment of the requirements for the degree of Doctor of Philosophy, The City University of New York

2002

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The Determination of The U.S. Internet Users' Characteristics,
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Advisor: Professor Salih Neftci

This study contributes to the literature on the Internet users' characteristics and Leading Edge Internet Users in U.S. There are two essays;

The first essay advocates that the U.S. is leading the world in the use of information technology. However, in U.S., some regions and segments of the population are more likely to have access to this technology than others. The dichotomy between those that have and those that do not have access to information technology is referred to as the "digital divide". Policy makers or analyst that focus on the digital divide consider the issue important because modern social interaction "e-society" requires increased use of computers and information systems. Third industrial revolution in U.S. brings a major contribution to the U.S. economic growth since last decade "e-business". In this study, we try to summarize the U.S. Internet users profile showing how Internet users profile changed during 29 months period. Monthly data were provided by Media-Metrix Company. Data were categorized by sex, region, household income, household size, age group, web page category, domain name, and utilization frequency. Data contain two sections; the first group is actual data sets (it comes from tracking meter at the end of each month) and the second group is potential data sets. A methodology was utilized to create time series to provide time-base-change for any demographic characteristics during

29 months, and to identify online users' monthly web-site preference and changes month by month.

The second essay: Lead users are users whose present needs will become general in a marketplace in the future. Since lead users are familiar with conditions, they can serve as a need-forecasting laboratory for market research. For marketing purposes, such as determining right audiences for right product, leading edge users must be found out to address the target groups' needs correctly. Also by monitoring leading edge group, next generation customer needs can be fulfilled which in turn will save time, cost and human efforts. We tried to analyze leading edge Internet users to identify the most notable users' characteristics. Data set, which covers 29 months regarding US online users, was provided by Media-Metrix. The econometric method utilized in this study has enabled us to find out that leading edge users have the following characteristics; have household income level ($25K-$40K), have children (or no children), household size 5+, have connected the Internet from Pacific region, were Female 18+ and Male 18+ shows. Hypothesis test carried out on the leading edge Internet users using leading group variable on the leading index proved that leading group prediction was highly close to actual Internet Users data. These results shall be utilized by online marketing companies to predict potential customers' future needs and demands. This approach is expected to save time and to reduce the cost associated with advertisement campaigns, which are unplanned rightly or targeting right user groups.

Acknowledgments

Whoever enters the Way without a guide will take a hundred years to travel a two-day journey
Whoever undertakes a profession without a master becomes the laughingstock of city and town
The Spiritual Teachings of Rumi, p. 123

The past five years in the Ph.D. economics program at The Graduate Center of The City University Of The New York has been filled with many hurdles to clear. During this long journey, as mention early by Rumi, there is a great guidance for me, peerless person, and has given me tremendous amounts of helps to keep my journey short and successful, without whom this study would not have been possible. I thank him here. For so much more, no words can be enough. I am eternally indebted to:

Prof. Salih Neftci

Whenever I need help I always find one of my professor very close to me, he has always help me no matter, academic or any personal problem. I want to publicly thank him and I would like to express my deepest gratitude to **Professor Michael Grossman** who had a tremendous amount of interest and support during my graduate study.

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Indeed, I have been fortunate to have a large group of friends and advocates rooting for me, and occasionally dragging me along kick end in screaming. I would like to thank all of them. I must firstly mention my special friend, great respectful person, **Mehmet Demiroglu;** he has always showed me very kind help and support. I have endless sincere to him. Secondly, my great neighbor, friend and advance engineer Fahrettin Ozturk. Once I started, helped me sustain momentum. In addition, providing regular doses of encouragement.

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I am grateful to my family who encouraged me, admired me, and let me do writing without distracting me too much with the mundane needs of running the household. Earning this degree is a big honor for me, that honor belongs to my wife, Aysegul Durmus, as well as me. With her tremendous love, support and interest, she has given me the strength to believe that anything is possible.

I dedicate this study to both my son Mirac and Bugra Durmus. I am wishing that they will write their own dissertation one day and dedicate it to me.

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Rendering of The Leading Edge Internet Users By an Econometric Study

Glossary

Ad Clicks :Number of times users click on an ad banner.

Ad Click Rate :Sometimes referred to as "click-through," this is the percentage of ad views that resulted in an ad click.

Ad Views (Impressions): Number of times an ad banner is downloaded and presumably seen by visitors. If the same ad appears on multiple pages simultaneously, this statistic may understate the number of ad impressions, due to browser caching. Corresponds to net impressions in traditional media. There is currently no way of knowing if an ad was actually loaded. Most servers record an ad as served even if it was not.

Cyberspace :Coined by author William Gibson in his 1984 novel "Neuromancer," cyberspace is now used to describe all of the information available through computer networks.

Domain Name :The unique name of an Internet site; for example www.cyberatlas.com. There are six top-level domains widely used in the US: .com (commercial) .edu (educational),.net (network operations), .gov (US government), .mil (US military) and .org (organization). Other, two letter domains represent countries; thus; .uk for the United Kingdom and so on.

Gross Exposures: :Each time a Web server sends a file to a browser, it is recorded in the server log file as a "hit." Hits are generated for every element of a requested page (including graphics, text and interactive items). If a page containing two graphics is viewed by a user, three hits will be recorded - one for the page itself and one for each graphic. Webmasters use hits to measure their server's work load. Because page designs vary greatly, hits are a poor guide for traffic measurement.

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Host :An Internet host used to be a single machine connected to the Internet (which meant it had a unique IP address). As a host it made available to other machines on the network certain services. However virtual hosting has now meant that one physical host can now be actually many virtual hosts.

Internet :A collection of approximately 60,000 independent, inter-connected networks that use the TCP/IP protocols and that evolved from ARPANet of the late '60s and early '70s.

IP address :Internet Protocal address. Every system connected to the Internet has a unique IP address, which consists of a number in the format A.B.C.D where each of the four sections is a decimal number from 0 to 255. Most people use Domain Names instead and the resolution between Domain Names and IP addresses is handled by the

network and the Domain Name Servers. With virtual hosting, a single machine can act like multiple machines (with multiple domain names and IP addresses).

Page :All Web sites are a collection of electronic "pages." Each Web page is a document formatted in HTML (Hypertext Markup Language) that contains text, images or media objects such as RealAudio player files, QuickTime videos or Java applets. The "home page" is typically a visitor's first point of entry and features a site index. Pages can be static or dynamically generated. All frames and frame parent documents are counted as pages.

Page Views :Number of times a userrequestsa pagethat may contain a particular ad. Indicative of the number of times an ad was potentially seen, or "gross impressions." Page views may overstate ad impressions if users choose to turn off graphics (often done to speed browsing).

Server :A machine that makes services available on a network to client programs. A file server makes files available. A WAIS server makes full-text information available through the WAIS protocol (although WAIS uses the term source interchangeably with server).

Unique Users :The number of different individuals who visit a site within a specific time period. To identify unique users, Web sites rely on some form of user registration or identification system.

Visits :A sequence of requests made by one user at one site. If a visitor does not request any new information for a period of time, known as the "time-out" period, then the next request by the visitor is considered a new visit. To enable comparisons among sites, I/PRO uses a 30-minute time-out.

Essay 1

The Determination of The U.S. Internet Users' Characteristics, Dynamic Preference Change

Chapter I

1. Introduction

Technological progress comes in waves. The British Industrial Revolution (1760-1850) ushered in Cort's puddling and rolling process for making iron, Crompton's mule for spinning cotton, and the Watt steam engine. The second Industrial revolution (1890-1930) witnessed the rise of electricity, the internal-combustion engine, and the chemical industry. The birth of information technology may hear the start of a Third Industrial Revolution, said by Jeremy Greenwood at recent article (May 1999), at Rochester University.

In the early 1960s, US Department of Defense was developed computer networks that could withstand nuclear attack. Main object was that if one route was damaged or destroyed, the network could send the data to the same point over a different alternative path. This idea was a fundamental architectural base for the basic feature of the Internet. Cold war competition was created a better communication system among computers. Later on US academic research institutions were involved for developing better Internet system at 1973 and then it was extended to the UK. During the 1980s, the Internet began to take shape with Internet standards. First thing come out standard communication protocol being established (IP). By the 1990s the Internet started to move from government and academic network to a mass-market network. In 1992, a British Scientist, Tim Bernes Lee, began working on the World Wide Web project (WWW). Netscape and Microsoft Internet Explorer browser came out and make it

easy and cheap to use Internet for anyone. In 1995, the control of shifted away from academia and towards the commercial market.

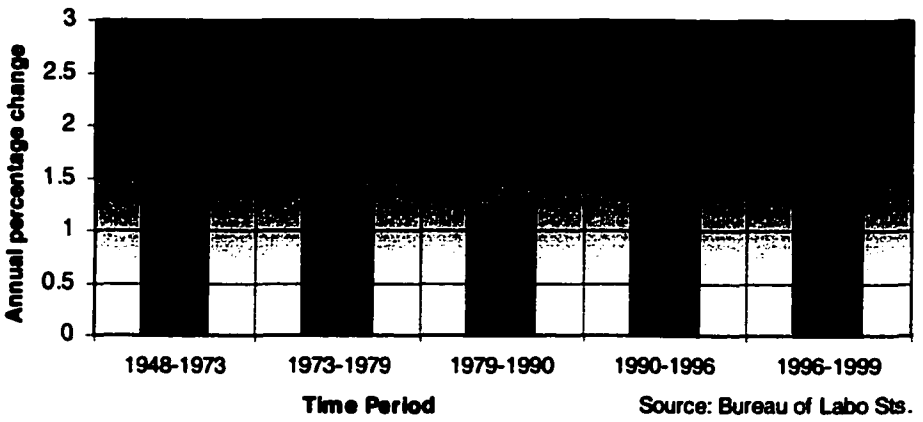
1.1. Macroeconomic point of Internet Economics

Something has happened to the US economy. An economy has begun to lag behind the other industrialized countries somehow managed to find a renewed strength in the 1990s and widen the prosperity gap to its peers. The exact opposite of what should be happening according to the convergence hypothesis, "*which predicts that countries with a lower initial per-capita GDP should grow more rapidly than those with a higher initial per-capita GDP* (Romer 1996) Otherwise the 1990s were a decade of disaster and stagnation for much of the global economy, with crises in Mexico, Asia, Russia and elsewhere having global repercussions. (See IMF 1999a). A number of phenomena on both the supply side and the demand side support the US Economy's longest ever expansion, which began back in early 1991. (Romer 1996) One key factor has been the investment boom seen in the 1990s,with businesses heavily, especially in information technology. In real terms, gross capital investments have almost doubled since 1991. One explanation for the greater willingness to invest is that productivity growth has also begun to climb in recent years. The most common measure of productivity, output per man-hour in the non-farm business sector, accelerated during the 1990s. Annual productivity growth averaged around 2 per cent over the decade as a whole and has averaged more than 2.5 per cent over the last three years, which is back at the levels seen during the "Golden Age" **Figure I.1**. The investment boom has led to a process of "capital deepening" –an increase in

capital per employee. (See, Council of Economic Advisers, 1999). The rapid improvement in productivity has meant that profits have been maintained and real wages have risen.

One of the well known topics in macroeconomics is total factor productivity (TFP), which depends on factors other than just increases in inputs of labor or capital and tends to be linked with technological development and organizational improvement (also called the "Solow residual"). The change in TFP in recent years has given rise to hopes that the introduction of new technology, especially information technology, has begun to make step forward. According to the Federal Reserve, at least a third of productivity growth since 1995 can be attributed to TFP. (See, Bureau of Labor Statistics (1999)).

Figure I.1. Output per man-hour (non-farm economy)



High levels of saving and increasing amounts of capital employed per employee are not enough to explain growth in the longer term. If capital is to be employed per employee are not enough to explain growth in the longer term. If capital is to be employed effectively by the workforce, a technology factor (Solow residual) is needed to offer an ever better way of

creating and exploiting capital. The new growth theory (endogenous growth) defines this technology factor as innovations that constantly increase the productivity of both workforce and capital or as human capital, comprising all the knowledge that we can accumulate ad infinitum with a view to becoming more efficient and achieving increasingly high standards of welfare (Lucas 1988). According to this argument, growth depends on how many innovations are made, how efficiently they are exploited and how efficiently individuals accumulate and transfer knowledge (Barro, Sala-i Martin 1995). If we believe in a constant rate of growth over the long term, we could imagine a steady, "natural" rate of innovation and knowledge acquisition leading to steady growth rate.

According to Robert J. Gordon recent article (February 2002) the American latest achievement was the maintenance of low inflation in the presence of a decline in the unemployment rate to the lowest level reached in three decades. The sources of the US macroeconomic miracle of 1995-2000 was the post-1995 technological acceleration, particularly in information technology (IT) and complementary revival of productivity growth, directly contributed both to faster output growth and to holding down the inflation rate, but inflation was also held down by a substantial decline in real non-oil import prices, by low energy prices through early 1999, and by a temporary ending in 1996-98 of inflation in real medical care prices. In turn low inflation allowed the Fed to maintain an easy monetary policy that fueled rapid growth in real demand, profits, and stock prices, which fed back into growth of consumption in excess of growth in income. The technological acceleration was made possible in part by permanent sources of American advantage over Europe and Japan, most

notably the mixed system of government- and privately-funded research universities, the large role of US government agencies providing research funding based on peer review, the strong tradition of patent and securities regulation, the leading worldwide position of US business schools and US-owned investment banking, accounting, and management-consulting firms, and the particular importance of the capital market for high-tech financing led by a uniquely dynamic venture capital industry. While these advantages help to explain why the IT boom happened in the United States, they did not prevent the US from experiencing a dismal period of slow productivity growth between 1972 and 1995 nor from falling behind in numerous industries outside the IT sector. The 1995-2000 productivity growth revival was fragile, both because a portion rested on unsustainably rapid output growth in 1999-2000, and because much of the rest was the result of a doubling in the growth rate of computer investment after 1995 that could not continue forever. The web could only be invented once, Y2K artificially compressed the computer replacement cycle, and some IT purchases were made by dot-com's that by early 2001 were bankrupt. As an invention, the web provided abundant consumer surplus but no recipe for most dot-com's to make a profit from providing free services. High-tech also included a boom in biotech and medical technology, which also provided consumer surplus without necessarily creating higher productivity, at least within the feasible scope of output measurement.

New Economy skeptics such as Gordon (2000) agree that in computers, telecommunications, and other areas of durable manufacturing, technology has been improving at a rapid rate. Outside of durable manufacturing, however, our results contrast

sharply with those of Gordon, who argues that the acceleration in labor productivity largely reflects cyclical factors. Gordon uses the quarterly labor-productivity data for the private business and durable manufacturing sectors to "back out" a series on labor productivity outside of durable manufacturing, which he then attempts to decompose econometrically into trend versus cycle. Because of data limitations, Gordon's mapping is not necessarily precise – output in durable manufacturing is a gross output measure, whereas private business output is a measure of final sales (or value added). Changes in the materials-output ratio will, for example, change the mapping. Our industry data and the form of our utilization correction are also important differences.

Basu and M.Shapiro (2001) provide added support for the view that recent increase in the pace of productivity does correspond to an increase in technology: The corrections for utilization and adjustment have subtle effects on the timing of growth in the 1990s, but do not explain the notable acceleration in the latter half of the 1990s. Is the increase in the growth of technology sustainable? Basu and M.Shapiro results do not provide evidence one way other or the other. Nothing in our technique of calculating technical change can detect momentum. They framework does, however, provide one forecast that is favorable for the level of technology. Suppose the investment boom experienced in the 1990s is reversed. They framework suggests, all other things equal, such a reversal will provide a once-and-for-all boost to the estimated level of productive capacity. During the boom, resources are being diverted to adjustment. If this pace of adjustment slows, those resources will be available permanently for

production. While the effect on the growth rate is temporary, the effect on the level of output is permanent.

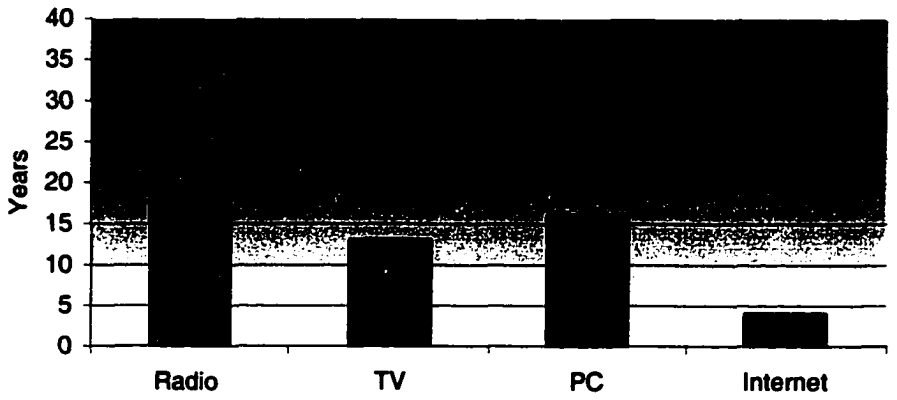
John Zysman and Steven Weber (2001) article give us great summary for E-conomy. Driven by two fundamental processes, rapid technological change as well as social innovation and reorganization, a new digital economy, the E-conomy, is emerging. Rather than merely adding an Internet sector to the economy, the E-conomy has brought about tools for thought, tools that transform every sector of the economy by amplifying brainpower the way steam engines amplified muscle power during the Industrial Revolution. For analytic purposes, the rise of the E-conomy can be told as a story composed of 1) networks and tools, 2) e-business and e-society, 3) the productivity dilemma resolved, and 4) governance and politics. In the short run, the transformative processes unleashed by the E-conomy are likely to lead to new bargains among existing coalitions and interest groups. In the long run, the changes underway promise to fundamentally alter the political sociology of huge communities, give rise to new interests and coalitions, and transform the institutional foundation of social, economic and political life. Stories about the digital economy, the E-conomy, have moved from specialty journals to the business pages and from there to the front pages of mainstream newspapers. The issues have evolved from the narrowly technical discussions of how best to configure a data network and the narrowly legal issues of patents and copyrights into significant policy battles over taxes, privacy, and intellectual property that have significance for the character of the marketplace.

1.2. Networks and Tools – the Infrastructure of the E-conomy

The equipment of this new Internet economy rests on advanced data networks and is facilitated by new software tools. The transformation of network communications underpins and expresses the evolving e-commerce and e-society story. The new Internet based economy grew extraordinarily quickly in comparison with earlier communications and transportation technologies. It took telephone technology 38 years to reach a penetration level of 30 percent of U.S. households. Television was faster, reaching 30 percent of households after about 17 years. The Internet, however, surpasses any previous communications technology in diffusion speed by accomplishing the same penetration in less than 7 years, **(Figure I.2).**

One of the main reasons for this rapid diffusion is that the new technological system, the Internet/web system for linking and addressing computers, could be initially deployed over the older, existing infrastructure for voice communication, telephones. This technologically-driven transformation interacted with and fueled a move away from the older voice infrastructure, plain old telephones (POTS) over a switched analog, then later switched digital network, in a public utility, or regulated monopoly, model, and toward competing public providers, private data networks, and "networks of networks" linked by routing data. Expected network system growth will be huge next ten years to get connected all around world. Wireless communication growth rate and advantage to create the best efficient network system make it easy to reach all small place in the world to get involved any small community.

Figure I.2: Years taken to reach 50 million users in the US (Dept. Of. Commerce)



1.3. E-business, E-society and E-generation

How new generations will demand and value credentialing; what changes are necessary to meet new demands, how changes will impact credentialing and how industry will respond. Those question answer not easy to answer now its needs more academic work to identify e-generation characters, preferences and difference than traditional customer.

Our society may ultimately be transformed by digital tools for thought and the data networks that connect the now universal computers. It is important to remember that we are still in the earliest days of technological innovation, with only the first glimmers of the commercial and social implications to come. Although there is much speculation on the subject, the question of how new communities will be shaped by the new technological possibilities is, inherently, unknowable – there are simply too many degrees of freedom. The telephone was proposed to be a means of listening to symphonies, before switched signals made it a tool for social and business communication. Business to business (B2B) and business

to consumer (B2C) projects have induced the development of a new data communications infrastructure. If significant changes in the broad dynamics of the E-conomy emerge in the first half of the decade, it appears that they will begin with the transformation of business. This transformation goes far beyond the introduction of computers into the workplace: as Erik Brynjolssen and Lauren Hitt point out, for every dollar spent on computers or other information technology equipment, businesses spend about ten dollars to reorganize their information, production, and social systems in order to use the new technology most efficiently. The real story is thus not about technology as such, but in the way technology enables and induces reorganization.

Department of Commerce publish recent study to show that how new innovations have been integrated into society ever more quickly. Figure I.1. shows how each new innovation engaged has needed less time than its predecessors to secure a broad distribution in the US. One of the big causes of a permanent shift in the growth rate is a change in the social and institutional picture. Such changes reflect a kind of improved "social technology" that impacts on the very core of the knowledge and innovation creation process: the behaviors of individual people. By better institutions we might mean a better climate for innovation and a better return on, or better subsidies for, the achievement of knowledge. (Romer 1990)

In the last decade has been the development of the IT sector, which accounted for just over 6 per cent of total GDP in 1993 but a third of GDP growth in 1995-97. Productivity growth in the sector has been extremely high, averaging 41.7 per cent per annum between1995

and 1999 (see, US Government Working on Electronic Commerce (1998) and US Department of Commerce (1999a). The last few years have seen this increasingly intensive computerization and connectivity within businesses begin complemented by the Internet, which in the form of e-commerce, is creating an integrated system between businesses and their customers and suppliers. The rise of the Internet and e-commerce suggest yet another technological edge for the US over Europe. Currently 55 per cent of key personnel in European businesses have e-mail facilities and only 60 per cent have access to the Internet. According to various estimates, US customers accounted for as much as 80 per cent of world e-commerce in 1999, compared with just over 15 per cent for Europe. However the number of Internet users is growing even faster than in the US, with e-commerce forecast to explode from just a few billion US 1999 to USD 250 billion in 2002. The next generation of Internet applications is expected to involve mobile solution.

Nielsen/ Net Ratings, Internet audience measurement service and Harris interactive a global leader in Internet-based market research, April 2001 reported that nearly half or 100.2 million people of the US adult population have made a purchase online. Finding from the Nielsen/NetRating and Harris interactive eCommerce Pulse, drawing online purchases from 48.2 percent of all Americans over 18 years old or 100.2 million people. Furthermore, more than 81.2 percent of all adults with Web access have made a purchase online since they started using the Internet. "Online shopping is not trivial when more than 80 percent of all Web surfers and nearly one out of every two Americans are involved – eCommerce has gone mainstream," said Sean Kaldor, vice president of eCommerce at NetRatings. More than $3.5

billion was spent online in March 20001, jumping 35.6 percent from $2.6 billion in April 2000. Two product categories accounted for more than half of this growth. Online travel spiked 58.5 percent to more than one billion dollars in March 2001, while clothing and apparel jumped 122.3 percent to $368 million.

The Internet economy is also compared today to the Industrial Revolution in potential scope and size. While the physical aspects of any economy are still based on raw materials like steel, oil, and gas the Internet economy is fundamentally different. This new economy relies on high-speed networks based on the Internet Protocol, Internet applications, new marketing and business tools, and electronic intermediaries to increase the efficiency of internet-driven markets.

1.4. Internet Users in the US

Ever communications medium in the 20th Century has evolved over some period of time from an infant stage to a fully adult stage of development. Almost all media have been revolutionary for their time. The telephone, radio, television, cable, satellites and others all made deep changes in how Americans work, play and socialize. But a strong case can be made that no medium prior to the Internet has grown so quickly to touch the daily lives of so many peoples. According to Inteco, 1998 was a year of critical breakthroughs for the Internet and the surge of users on the World Wide Web cannot entirely be attributed only to the increased popularity of online shopping during the last holiday shopping season. The Internet revolution in the commercial, social and civic life of America also appears to be accelerating technological

innovation and the convergence of various technologies into an entirely new communications environment.

Many studies have utilized database that are based on small sample sizes, and most of the data sample size is between 1200 to 3000. Responses obtained from several Internet users belonging to different regions, and characteristics such as household size, income level, sex, and age group reflect the general US Internet users' profile. This database mostly generated by personal interviews, phone calls, or Internet surveys. Although the aforementioned techniques have some advantages such as getting detailed data and easiness to reach to the user, they present certain disadvantages. These drawbacks include getting accurate information from the end users due to person's shyness which could source from being on adult web sites or gambling online casinos, or hard to remember past activities on the internet such as how many hours spent on the internet daily, or time spent per web sites, or types of web sites they visited.

The most reliable series of surveys done to determine the characteristics of average US Internet user have been carried out by the Center for Communication Policy at University California at Los Angeles (2001). The latest survey results were published in November 2001. The appealing feature of these study series, which covers more than two thousand households across America, is related to the fact that they continuously observe the preferencal changes in the same household Internet user for a year. Another interesting aspect of the UCLA Internet Project is that the study looks at the social impact of the Internet, which comprehensively

tracks a wide range of values, behavior, attitudes, and perceptions. In addition, the project focuses on Internet non-users as well as users.

However the UCLA study lacks four important aspects. Firstly, it is based on small sample size. Secondly, it only predicts yearly changes not on a monthly observation, which would have present more realistic results. Furthermore, it is very difficult to establish time series for behavioral changes. Lastly, it is very doubtful to get reliable answers from one-on-one household interviews because of the facts that end-user may change his responses for personal and family matters, and hard to remember entire yearly Internet activities.

Media-Metrix Company is a leader in Internet usage measurement. Media Metrix operates three samples of Web users (over 78,000 individual in all) that have installed a tracking meter on the computers that they use to access the Internet from both their residence and from work. They are very interested with our project and provided us all necessary database to see our project results. Data sets cover 29 months Since August 1998 to December 2000. Data covers total number of Internet users in the US monthly activity base on sex, region, household income, household size, age group, and web page category and domain name. Data contain two section first group is actual data sets (its comes from tracking meter end of each month) and second group is potential data sets.

In this study, we try to summarize the US Internet users profile and showing that how Internet users profile changed during 29 months. Base on regional difference, sex (male, female, teenage, children), age group, household income level, and household size for the US

Internet users. Bring together our data results and some major study to figure out why people connected Internet and what kind of activity they are doing during online connection. In this study, we have information that average minutes per users per month and average page views per user per month. Both are key indicators of the "stickiness" or attractiveness of a Web site or property. Average minutes represent the average amount of time the average visitor to the site spends on the site during the month. For example, Mail.com network recorded 130 minutes per users per month, meaning that the average visitor to Mail.com network in December 1999 spent over two hours on the site during the month. Average page views represent the average number of pages on a Web site or property viewed by the average visitor to the site during the month. For example, DoubleClick Network recorded 29 pages views per users in December 1999, meaning that the average visitor to DoubleClick Network viewed an average 29 pages during the month. The page views metric it's a critical measurement for Internet advertising contracts are based on impression or page view guarantees.

Chapter II

2. Review of Journal for US Internet Users Characteristics

2.1. Microeconomic point of Internet Economics:

Kridel, Rappoport and Taylor (1998), identify a number of important drivers for Internet access, using a logit modeling technique. Their model shows price elasticities for Internet access in the range –0.18 to –0.38, which they observe are higher then would be expected for access to the regular telephone network. Given the size of the estimated Internet price elasticities, they conclude that while price is an important factor in the current volatile growth in the number of Internet users, growth is substantially and endogenous process fuelled by network and usage externalities. They obtain an income elasticity of 0.36. Usage of advanced telecommunications services is shown positively correlated with the Internet access, as is education level and professional employment. Negative demographic influences are identified as age, household size, being married rather than single and perhaps surprisingly, living in a rural location.

Madden and Savage (1998), they studied the demand for Internet use for households in Western Australia and they used Logit model. They primarily focus on the impact of price structure on demand, where they found that flat rate price policy had a positive effect on usage, while time based charging acted as a disincentive. And plus they one other finding is that length of Internet subscription had a positive effect on usage and implying that a learning effect was obvious. There are interesting results regarding the relationship between income and

usage with high and low income variables being significant, and the strongest effects emerging in the middle of income range. This result reflects an observation in Cracknell (Cracknell, D., 1999, the changing market for inland and international calls. In 'The Future of the Telecommunications Industry: Forecasting and Demand Analysis', D.G.Loomis and L.D.Taylor, Chapter 5.) The study also shows a negative correlation between age and level of usage, and a positive effect through being male. The type of usage made of the Internet and indicates the strongest demand from those primary usages is usage of chat line, followed by those who use file transfer, those who browse, and those who use email.

David Cracknell, Sumit Majumdar and Nimeshh Patel (2000) obtain quantification of the drivers of Residential Internet demand for UK Their econometric models were fitted to the monthly British Telecom (BT) voice and Internet local call minute data since January 1996 to January 2000. Ordinary least squares regression model were developed relating call minutes per day to the following set of potential driver variables: *System size*, this was allowed for by modeling calls per main line. *The economy*, UK consumer spending at constant price was used in the models. *Price*, The measure used was revenue per minute, deflated by the UK Retail Price Index. *Value for Money*, Past experience has shown that customers are prepared to make more calls when their perception of whether BT offers good value for money is higher. *The number of mobile handsets*, to investigate effects of substitution from fixed telephony to mobile. *The number of Internet users*- a market research based measure of the percentage of households with access to Internet. And Internet traffic was tested in the voice model, to find substitution effects.

For voice and Internet price elasticity are higher than might be expected given previous UK studies of local call minutes and tendency of prices to fall in real terms in recent years leading to consequent fall in elasticity. The latest modeling suggests that the Voice elasticity has remained steady over the1950 and that Internet minutes are more prices elastic than voice. This latter result is given the recent debate in the UK about impact of telephone chargers on Internet development and the suggestion than the current lack of US style unmeasured price option for local calls is a significant deterrent. It also corroborates the US findings of Kridel and Rappoport and Taylor that the price elasticity for Internet access is higher than for voice access.

The economy has a weak effect on Internet minutes and no effect on voice minutes these results contrasts with Cracknell (1994), which gives an elasticity of 0.69, and the significant income effects established. It is likely that the steady growth, which occurred in the UK in the period under examination, provides insufficient statistical variation to give a reliable estimate of true effects. Nevertheless, it is likely that if customers regard the Internet as more of a luxury good than voice communication then the economic elasticity might be expected to be higher. This would be suggested by analogy with Kridel, Rappoport and Taylor study, where the income elasticity obtained was higher than the price elasticity. The Madden and Savage model indicates, however, that the link between income an usage maybe more complex, with strong elasticities in the middle income range, but weak effects amongst high and low earners. These, potentially conflicting, results indicate that the relationship between Internet demand and income is one that might warrant fuller investigation

The number of users is also important for the Internet, but the elasticity at 0.198 indicates that new users are likely to log onto the net for less time per day than established users. Also logit model confirms the result. Value for money perception is an important driver for voice minutes, but appears to be less significant for Internet. A possible conclusion that could be drawn from this is that Voice usage is more likely to influence customer choice of telecommunications operator. Substitution effects are starting to show through, and will become more important features of the market as the time passes. At present, there is a small substitution effect between fixed and mobile, but this may be expected to become stronger over time. The modeling also provides an estimate of the substitution effect between Voice and Internet, indicating 1 Voice minute lost for each 8.8 Internet minutes generated. A part of this loss may represent migration from fixed onto mobile networks. The relationship between Internet demand and system size is, in reality, more complicated than implied by the modeling work. Internet is a significant driver in demand for additional Residential lines.

In this study also that database provides information on Internet usage, and a number of demographic characteristics. The sex of a person is a significant feature, with the proportion of males from the sample set accessing the internet from home being dominant compared to proportions for females, and both sexes are experiencing similar growth rates. Access to the Internet at home is strong amongst all age groups. High Income bracket households were dominant amongst those connected to the Internet. Disparity between low and medium income households is not as much as might be expected and hence one can conclude that the Internet is no longer just for the high/medium income earners. Affordability of computers is

no longer a huge deterrent in accessing the Internet due to ever increasing reductions in prices. As might be expected, the highest proportion of Internet users is to be found amongst those with high call bills.

Internet demand can also generate demand for other services-we have noted that around 15% of Residential users have installed a second fixed line for Internet usage, and that a number of the voice calls which appear to be lost when such usage increases may migrate onto mobile networks. As usage increase, more service, such as banking, may increasingly encourage web access to save costs.

UCLA Center for Communication Policy report at November 2001 created a base profile of behavior and attitudes about Internet use and non-use. It's a comprehensive, year-to-year examination of the impact of online technology on America. And also explore how the Internet influences the social, political, and economic behavior of users and non-users. The project surveys more than 2000 households across America. Each year they contact same households to explore how online technology affects the lives of those who are continuing Internet users, those who remain non-users, and those who move from being non-users to users.

We could list some major finding from that report. 72.3 percent of Americans in 2001 go online, an increase from 66.9 percent in 2000. Users in 2001 go online about 9.8 hours per week, up from 9.4 hours per week in 2000. The top five most popular Internet activities are using email and instant messaging, web browsing, buying online, finding entertainment

information and reading news. Top reason why users started to use the Internet is to obtain information quickly, followed by work needs, and then access to e-mail. 48.9 percent of Internet users purchased online in 2001, down from 50.7 percent in 2000. Very experienced Internet users spend a larger proportion of time online spending e-mail, doing professional work, looking for news, or trading stocks. New Internet users spend a greater proportion of their time visiting chat rooms, playing games, and browsing online.

The primary reason why 27.7 percent of Americans are not online is "no computer" or "Lack of access to adequate computer." The number of non-users who are "not interested" is declining. Internet users watch 4.5 hours per week less television than non-users. And, television-viewing decreases as Internet experience increase. Internet users may find the time to go online by reducing their television viewing. Increasing number of users say the Internet is an important source of information. Even new users believe that the Internet is a very important or extremely important source of information. 58 percent of users in 2001 believe that most or all of the information online is reliable and accurate.

While attitudes may be changing, one point found in the 2001 survey remains paramount: almost half of Internet users purchased online in 2001. In spite of a declining economy, uncertainty in online retailing, and continuing concerns about online privacy, 48.9 percent of Internet users made at least one online purchase in 2001. When asked why users wait to make their first online purchase, concern about fraud and deception rank among the top reasons. Internet users deep concerns about privacy among all users; prominent among the privacy

issues was concern about credit card security. Growing numbers of users say that e-mail helps them communicate with people they could not normally connect with otherwise. Although Internet users consider e-mail a powerful tool stay in touch with people they know, they do not believe in it is easier to meet new people online than in person.

When asked if "people who go online put their privacy at risk" more than half of Internet users and nearly three-quarters (74.5 percent) of non-users in 2001 either agree or strongly agree. Nearly all respondents (94.5 percent) report some level of concern about the privacy of their personal information when or if they buy online.

Internet users overall believe that the Internet either has no influence on the amount of time they spend together with household members, or positively influences household time together. If the question asked "How does the Internet affect time with family and friends?" Internet users spend more time than non-users socializing with friends, and almost as much time socializing with family members. Users and non-users report similar amount of time involved in activities with household members; the only decline was time spent watching television. Almost one-quarter of children are now watching less TV then before they started using the Internet. The grades of children in their household have stayed the same. Users in 2001 in 2001 says the Internet continues to be an important resources for gathering information about political issues, but declining numbers believe that the Internet gives them more political power, or helps them influence political decisions and government officials. Does the Internet affect workplace productivity"? Most users say the Internet is a mechanism

for workplace productivity. Of employees who say the Internet makes them less productivity, the most frequently cited reason for lower productivity is spending time on the Internet doing things unrelated to their jobs

Chapter III

3. Methodology

3.1. Data base source and Methodology

Media Metrix is a leading provider of Internet and Digital Media measurement products and services. The company starts to measure usage of the entire digital landscape, including its largest segments. In the market their measurement data met with huge demand by advertising agencies, new and traditional media companies, e-marketers, technology companies and financial institutions. They have currently international operation too. Company is setting the global standard for Internet and Digital Media audience measurement. Media Metrix data are used to buy, sell and plan advertising, support marketing and commerce initiatives, Asses partnerships and distribution strategies and analyze competitors.

Media Metrix patented metering methodology, which collects actual usage data from randomly recruited, representative samples of tens-of-thousands of people in homes and business around the world. The meter is a software application that works with the PC operating system to passively monitor all user activity in real time click-by-click, page-by-page, and minute-by-minute. The usage data are aggregated to create the most extensive and comprehensive database of actual Digital Media usage available today. Whole Universe is defined as all those individuals who used the Internet or any Digital Media at home, at work or at college during the past 30 days. Media Metrix takes two complementary approaches to the measurement of banner advertising, a sample approach (The Ad Network Report), and a

competitive tracking approach (Ad-Relevance). Our data source comes from The Ad Network Report. Using audience measurement methodology. Media Metrix records each file requested by a user. All banner ads being viewed by the sample and classify them according to the network responsible for the distribution, for example AdSmart, Flycast Network. Actual and potential reach of each of the major network data available. Ad Networks and their channel are tracked across key measurement criteria including measures (Reach % and Unique Visitor (000)) and frequency measures (Day, Pages, Time, Spent Per Person). Also audience estimates and audience composition are provided across age within gender demographic groupings and household demographics. Monthly report intervals are between First day of Month and last day of Month. When I say April 1999 reports includes data from April 1, 1999 through April 31, 1999.

For our study we used 15-major Ad Sales Network and this report divided two major sections Actual Reach and Potential Reach data sets, there are two way to measure Ad Networks. ***Potential Reach*** one of the way of estimating the reach and audience composition of an Ad Network is to sum up the unique audience across all the sites in the Ad Network as a whole and Ad Network Channels, individually. Ad Sales Networks has contracted with Media Metrix and signed an agreement stating the company understands and will comply with the guidelines established by Media Metrix. ***Actual Reach*** second method to estimated the reach and audience composition of an Ad Network is to count the audience that received an ad provided by a third party ad server. For the real-time panel, Media Metrix has the technical capability of measuring when a user receives an ad and, therefore, has the ability to calculate

Actual Reach. They are using real-time software, that software contains all data representing the origin of all the sources. This ability to evaluate third-party ad server activity on all websites enables performance measurement. It is an accurate measure of the ads viewed.

Media Metrix is using two similar tracking meters are used to collect web usage activity. One-third of the panel currently uses the Media Metrix real-time tracking software to detain and transmit the web usage activity. Internet users install the software on all computers that the Household members use to access the Web in their place of residence and their place of work. Each household member chooses himself or herself from list of software's user identification screen. The software passively records all Webs browsing activity, sending all clickstream data, user demographic and computer information to Media Metrix servers in real-time, as the user moves about the Web. If the computer has been inactive for more than 30 minutes, the meter requires indicating again who is at the computer. Second tracking software name is Media Metrix PC Meter software; users also install on all computer in the at home and primary computer at work. On the first day of each month, a retrieval disk arrives via mail at the respondent's home and place of work, with instructions how to download the collected data. The disks are returned to Media Metrix for reading, processing, coding, and tabulation over the following several weeks.

3.2. Calculating the Estimates

In order to accurately measure total computer usage, Media Metrix recruits a sample of households and requests each individual in the household to install and use the meter at all

locations where he or she uses a computer. Cooperation rates differ between At Home and At Work installation. Some people will install the meter At Home but not At Work.

Likewise, there are those who install At Work but not At Home. Estimate the Aggregates and Combine Media Metrix uses an Estimate the Aggregates approach for producing the integrated estimate of computer usage and thus, Digital Media usage. Given that Media Metrix presently operates the largest sample of At-Home users, it can produce very reliable estimates of the number of people using a computer, or any Digital Media, At Home. Incorporated are each and every respondent in the sample including those in cells 1, 2, and 3. This sample naturally distributes itself among those who also use a computer At Work and those who do not also use a computer At Work. Whether or not they are also measured At Work is irrelevant when the objective is to produce as reliable an estimate as possible of At Home usage. Media Metrix also operates the largest sample of At Work users. That sample can be similarly projected to produce estimates of the number of people using a computer, or any Digital Media, At Work. Again, the behavior of each individual under measurement (regardless of At Home usage, and regardless of whether or not they are measured At Home) can and should be included.

The two samples do overlap, with a portion of the At Work measured respondents that also installed the meter At Home. The both sample can also be projected to its universe estimate. These three terms (At Home, At Work, At Both) can be combined to produce an estimate of the total number of people using a computer, any application, any online service,

the World Wide Web, or any Website At Home or At Work. If we know how many different people used At Home and how many different people used At Work, we can combine the two estimates to get a total. That total, however, will have double counted people who used in both locations. The estimate of the number of persons who used in both locations is produced, however, and can be subtracted from the duplicated total resulting in the Net Unduplicated Audience.

3.3. Calculating Other Home/Work Measures

Duplication must be managed throughout the reporting process, taking into account reporting detail, time and the specific measurements or estimates being produced. In the course of a month, the standard Media Metrix reporting period, an user can visit a site/channel/application both from home and from work, so the duplication must be taken into account when estimating the number of unique site/channel/application visitors. Further, estimates of duplication must be addressed at all reporting levels: The total medium (all Digital Media for example), and for reported aggregations such as categories of sites, site consolidations, individual websites, entire online services, channels within online services, applications, etc. The following section gives us brief description of technical definition.

Unique Visitors: Consider the estimate of the number of unique visitors to Proprietary Online Services. A user who used America Online from Home on the fifth of the month and CompuServe from Work on the tenth would be considered duplicated users of Proprietary Online Services in the month, but not duplicated users of America Online or CompuServe.

Unique Visitors (UV) =Visitors*Weights

Usage Days: When estimating the average number of Usage Days Per Person user estimates must be unduplicated at the individual day level. A user, who visits I-Village At Work on the fifth of the month, and I-Village At Home on the sixth of the month, has visited I-Village on two different days -- one user, two visiting days. If that same person visited Lycos on the seventh At Work and on the same day did so At Home, the user must be credited for one day

Time: Only Unique Visitors and Usage Days need to be unduplicated. Time is simply additive. If a user spends 15 minutes on USA Today At Work, and that same night spends another 30 minutes on USA Today At Home, the total amount of time spent viewing is 45 minutes (15 minutes plus 30 minutes) -- one user, one day, 45 minutes This technique is used in this Ratings Report for all Home/Work Integrated Estimates Usage Days Per Person. The average number of different calendar days during the course of the month on which a user visited a Website, channel or an application.

3.4. Measures Unduplicated Audience

Digital Media Reach %: The percentage of projected individuals that visited a specific website, category, channel, or application among the total number of projected individuals using any Digital Media during the course of the reporting period.

WWW Reach %: The percentage of projected individuals that visited a specific website or channel among the total number of projected individuals using the World Wide Web during the course of the reporting period. Reach (%) = UV (demo)/ Universe Size (demo)

3.5. Frequency Measures

Average Daily Unique Visitors (000): The estimated average number of different individuals (in thousands) that visited any content of a website, a category, a channel, or an application per day during the course of the reporting period.

Average Daily Unique Visitors = (UV*Avg. Days)/#days in period)

Average Usage Days per Visitor per Month: The average number of different days in the month, per person, in which a Website, category, channel, or application was visited. A person is defined as a visitor if they access at least one page of content within the Website, category, channel, or application. A day is defined as 12:00 midnight through 11:59:59 PM

Avg. Usage Days per Visitor per Month=((Visitor*(total unique pages)*Weights)/ UV

Average Unique Pages per Visitor in a Day: The average number of different URLs made per day by those persons visiting the Website, category or channel. A unique page request is defined as a specific URL that was successfully loaded by the browser at least once in the day. Even if the page was viewed many times, the page is counted only once under the unique page request definition. In the case of non-web content, unique pages are the equivalent of unique Window Titles, if applicable, and if not, are undefined and set to zero.

Average Unique Pages per Visitor in a Month: The average number of different page requests made per day over the course of the month by those persons visiting the Website, category, channel, or application.

Avg.(Daily)unique pages per visitor per Month =(Visitor(total unique pages)*weight)/ UV

Total Usage Minutes (000): The total number of usage minutes spent at the Website, category, channel, or application during the course of the reporting period.

Average Minutes per Usage Day: The average number of minutes spent on the Website, category, channel, or application during the day, per visiting person.

Average Minutes per Usage Month: The average total number of minutes spent on the Website, category, channel, or application during the month, per visiting person.

Avg. Minutes per Visitor per Usage Month=(Visitor (total minutes)*Weight)/UV

Average Minutes Spent Per Unique Page: The average number of minutes spent on each unique page during the day.

Avg. (Daily) Unique Pages per Visitor per Month= ((Visitor (total unique pages@Home) * Home Weight) + (Visitor (total unique pages @ Work)*Work Weight))/ Combined UV

Average Daily Unique Visitors= (UV*Avg. Days)/#days in period)

Composition: The percentage of a Website, category, channel, or application's visitors that belong to a specific demographic grouping. Composition (%) = UV (Demo)/UV (All)

Chapter IV

4. U.S. Online Users' Characteristics.

In this study our simple objectives are threefold 1) Provide interested parties – consumers, market researchers, Internet-based business interests, - with the accurate baseline numbers and marketing insights necessary to aid decision-making and stimulate inquiry in this complex and rapidly changing environment 2) demonstrate the difficulties and indeterminacies inherent in estimating a complex and moving target. 3) create a time series to provide time base change demographic characteristics.

The rate of growth of Internet use in the United States is currently 1,5 to 2 million new Internet users per month. Individuals continue to expand their use of computers and the Internet. As of September 2001, 174 million people or 65.6 percent of the U.S. population were computer users. One hundred forty three million people or 53.9 percent of the population used the Internet according to NTIA.

One other number for online user's population is from UCLA reports say 72.3 percent of Americans in 2001 go online. Nielsen rating company announced Internet users in US is 166 million almost 60 percent of American is online currently as of March 29, 2002. Children and teenagers are the most likely to use the Internet and computers. Ninety percent of children between the ages of 5 and 17 (48 million) now use computers, the study found. Three-quarters of 14 to 17-year-olds and 65 percent of 10 to 13-year-olds use the Internet. It's no surprise,

then, that households with children under age 18 are more likely to have Internet access than those without children (62 percent versus 53 percent).

Dial-up access is still the norm for most Americans that access the Internet, with 80 percent of residential Internet using dial-up. But the survey found that from August 2000 to September 2001, residential use of broadband Internet access doubled from 4 percent to 11 percent of all individuals, and from 11 to 20 percent of Internet users.

The most popular use for the Internet is still e-mail, which is used by 45 percent of the overall population, up from 35 percent in 2000. According to NTIA study, approximately one-third of Americans use the Internet to search for products and service information (36 percent, up from 26 percent in 2000). Among Internet users, 39 percent are making online purchases and 35 percent are searching for health information.

The study also offers evidence that use of the Internet and computers has spread from work to the home. Approximately 24 million of the 65 million employed adults who use a computer at their job also work on a computer at home. The presence in a household of someone who uses a computer at work makes it far more likely (by a margin of approximately 77 percent to 35 percent) that the household owns a computer or uses the Internet at home.

4.1. The World's Online Populations

CyberAtlas research staff tries to maintain Internet users for countries around the world using by CIA population statistics, ISP data sources and also online users in any giving country

from Nielsen/Rating data source. Table IV-1 shows that current estimate number of online users on the world is around 445 million or one other research says 535 million. More than 30 percent of online users live in US. The Highest ration for Internet users versus Country population is over 50 percent only for US, Sweden, UK, Switzerland, and Canada. Most countries' online users are less than 10 percent of population. Second information on the same table is number of Internet Service Providers (ISP). US have more than 7500 ISP's then next biggest number of ISP from Canada 760, Australia 718 and 245 ISPs from UK. More than 12 countries have only 1 ISPs. The feature that will drive E-commerce is free product delivery (98%), On-time delivery guarantees (95%), No sale tax is 95% Table IV.3.

4.2. Web Pages by Language

According to Forrester Research Table IV-2, 50 percent of all online sales will be sold outside the US by 2004, meaning that multilingual sites are a must for companies looking to succeed in the new economy. What languages dominate the Web? It should come as no surprise that English still dominates the Web, with more than two-thirds of the Web's pages being in English. According to a study by Vilaweb, a Web site in the language Catalan, Japanese is the second most popular language of Web sites. Although 30 percent of online users on the live in US, dominate language is still English.

4.3. US Online Population by Gender

In 1998, males were more likely than females to be Internet users. Between February 2000 and December 2000, this difference disappeared In September 1998; the Internet use rate

was almost equal 40 percent for both male and female age over 18 as of December 2000. 12 percent teens and 8 percent kids online users measured.

4.4. Male

The number of female at-home Internet users in the United States grew faster than the overall Internet population. American men still spend more time online than women, Nielsen//NetRatings found. In December 2001, men spent 24 percent more time online at home than women, averaging 11 hours (a 17 percent increase from a year ago). Females access the Internet, on average, 17 times in December 2001, a 13 percent increase from a year earlier. Men viewed 40 more pages on average than women, 801 pages versus 573 pages.

Table IV.3. Internet Usage Patterns by Gender Dec. 2001, U.S. At-Home Users

	Dec. 2000			**Dec. 2001**
	Males	**Females**	**Males**	**Females**
Avg. Time Spent (hr:min:sec)	9:42:14	7:44:57	11:20:27	9:06:51
Number of Sessions	18	15	21	17
Avg. Pages Viewed	667	503	801	573

Source: Nielsen/NetRatings

Figure IV-3 shows brief distribution by age for Men 18+, August 1998, Men online users almost 50 percent than decreased to 40 percent as of December 2000. Age of 25-49 group of Men Online population is decreased from 35 percent to 24 percent end Of December 2000 (Figure IV-5). Total online users increased more rapidly than Men 18+ group online users. Men age group monthly changed amount steady and almost same among 5 age groups. Dominant Men Online users age group is 25-49.

Average Internet used compared at Table IV.4. between Canada and USA. Both countries online users are spending same amount of time online per month (9:35:00). Duration of a page viewed is almost same again, 47second. Canadian online users spend same time online with US users but they visited more site than US users. 20 times connecting online each month from Canada for US is 18.

4.5. Female

According to a survey of online women by NetSmartAmerica 58 percent of the new Internet Users in the US are women and predicting that at current growth levels women will lead men in Internet access 60 percent to 40 percent by 2002. As August 1998 women online users are 22 million, after 29 months growth by 37 percent and end of December 2000, 32million women age over 18 populations in the US. (Figure IV. 4). Thos most active age bracket for woman age bracket is 25-49 (more than 35 million online users), 25 percent of woman within this age bracket. Age is more than 55+ for woman also steady increased to 5 percent end of December 2000. (Figure IV-6)

According to Harris Interactive and Proctor & Gamble survey the average online woman is more likely to be married than single and women control 80 percent of all purchasing decisions. Gina Garrubbo from Women.com said" Women have created an online revolution that has closed the Web's gender gap, and have become the dominant force on the internet today". 41 percent of today's 55 million Internet shoppers are women.

4.6. What Makes Women Click?

According to NetSmart III - What Makes Women Click are relationship-building strategies. Result of survey found that new products are the primary reason woman click on ad banners (74%) and view new Web sites (79%).

4.7. Teens

12 percent of online users (10 million users) are teenager; it's faster growing online users population recent years by Figure IV-7 and Figure IV-8. During the last 29 months performance teenage composition increased 4 percent from 8 percent to 12 percent. Growth rate of teenage users is much highest than any other user group.

Teachers Say Internet Improves Quality of Education: More than eight out of ten teachers (84 percent) believe that computers and access to the Internet improve the quality of education, according to a survey by education technology nonprofit NetDay, and 75 percent of teachers said the Internet is an important tool for finding new resources to meet new standards. According to a recent survey by PricewaterhouseCoopers results shows that while teens access the Internet for a variety of reasons, shopping is seldom one of them. In fact, most teens regularly go online to send or receive e-mail and nearly half indicate that e-mail is the primary reason they go online (44%) Table IV.6. While just over one-fourth of online teens cite shopping as a reason for regularly going online, only 2 percent indicate that shopping is their primary reason for going online.

4.8. Kids

As of December 2000, more than 8 million children in the US are online FigureIV.7. and 9 percent of users are children Figure IV-8. Recent study from Grunwald Associates says 40 percent of American children are online. The report, "Children, Families, and the Internet 2000," found that teenagers are online the most, with 70 percent accessing the Net regularly. It also found that 14 million children go online from school, while nearly 18 million children are online from home (many children go online from both locations). In 55 percent of the households surveyed, at least one parent uses the Internet from locations such as work and home. Figure IV.5 shows what kids do online and almost 80% play a game and 72% use email.

By 2005, the report predicts, almost 44 million children ages 2 to 17 will be using the Internet. The Zandl Group survey also found some signs of an e-commerce future among younger Internet users. Half of them have checked out something online and then gone to a store to buy it. For these kids, the barriers to online purchasing include parental permission (56 percent), the risk of buying something without examining it first (36 percent), access to credit cards (32 percent), high prices (20 percent), confusing procedures (16 percent), and the difficulty of returning merchandise (14 percent).

4.9. Distribution of US Online Users by Age

One would expect to see the current plateau for Internet use among those ages 25 to 55 extend to older ages over time because the overall upward shift in the age distribution shown Figure IV.5 and Figure IV.6. The first result is an absolute increase in Internet use by people

and the second is a cohort effect. The cohort effect describes the fact that the people who are in the 55- year-old age cohort in September 2001 are not the same people who were in this age group in earlier surveys. The 55 year olds of September 2001 were mostly 51 year olds when Census first asked about Internet use in October 1997. People who used the Internet when they were younger will likely continue to do so as they age.

4.10. Household Income Distribution of US Online Users

The biggest percent of online users' income segment bracket is ($25K-$59.9K) and it's around 28 percent during 29 months time period, Figure IV-9. More than 20 million online users' income level between $40K-$59.9K represent the biggest segment and Income level of bracket (under $25K) has a steady and the highest growth performance since August 1998, Figure IV-10. The poorest segment (incomes of less than $25,000) will represent only 11 million online users. Recent study shows that lower income level online users interest growing much faster than any other income level.

4.10.1. Lower-Income Households Moving Online

While the number of Internet users with annual household incomes of less than $25,000 has grown nearly 50 percent, (Nielsen Group study) outpacing the growth of total Internet users, they still only represent 11 percent of the overall online population, lower-income Web users, generally newer to the Internet, tend to be less experienced Web surfers and spend more time online (about 13 hours per month) viewing more unique pages of content. Higher-income users, on the other hand, tend to be more experienced surfers, spending less time --

just over 9 hours -- and viewing less content (about 550 pages per month in June 2000, compared to 700 for low-income users).

Between December 1998 and December 2000, Internet use by individuals in the lowest income households (those earning less than $25,000 per year) increased at a 25 percent annual growth rate. Internet use among individuals in the highest-income households (those earning $75,000 per year or more) increased from a higher base but at a much slower 11 percent annual growth rate. Internet use is growing faster among people in lower family income brackets Internet use among people who live in households where family income is less than $25,000 grew at an annual rate of 25 percent between December 1998 and December 2000 Over the same period Internet use grew at an annual rate of 11 percent among people living in households where

4.11. Household Size Distribution of US Online Users

Four family household sizes is dominant online users characteristics but on the other hand it's decreased from 301 percent at August 1998 to 25 percent at December 2000, number of online users around 20 million (Figure IV-11). Two-person household is 20 percent of whole online population. 4 people family size composition decreased when 2 people family size composition and fastest growing household size is one-person household and its start increased 5 percent to 10 percent of whole online population end of December 2000. (Figure IV. 12).

4.12. Regional Distribution of US Online Users

The most active region is Pacific region and almost 20 million online users from Pacific region and its makes 20 percent of whole online population; the lowest online user population is in East Sought Central region, (Figure IV.13 and Figure IV.14). Growth rate of online user's population for all 9 regions' is almost same. As we find on the second essay, Pacific region users are very active have leading characteristics.

Chapter V

5. User Dynamic Behavior and Preference Change

5.1. Frequency Measures

5.1.1. Average Usage Days per Visitors

US Web surfers nearly 50 average minutes spent per usage days at home and work in December 2000, it's 65 percent more time spent when we compared to August 1998 average time spending. Web surfers spend more time at work then home. At work average minutes spending almost 50 minutes but at home is 45 minutes. Figure V.1

Monthly statistics for average minutes spending was 725 in November 2000 then decreased to 625 in December 2000. Its 120 percent more than august 1998 monthly spending in Home and Work together measured. US web surfers spent more than in work then home almost 40 percent more time spending at work monthly, Figure V.2. US Web surfer visiting average 30 web pages daily in August 1998 and then start increasing to visiting more web page and end of December 2000, They visited almost 50 pages per day, its 60 percent increased since August 1998. At work they visit 50 page daily and at Home 42 pages, Figure V.4.

Monthly US online users are visiting to around 700 unique pages as of December 2000. At work they are visiting 600 pages, at home 500 pages monthly. During the summer time, slightly decreased average number of unique page visits and then starts increased after August. Almost 100 percent more web pages visited when we compare to August 1998 result. Figure

V.5. Average Internet usage days per visitors were 11 pages in August 1998 and then end of December 2000 was 14 days, Figure V.1.

Data from Media Metrix given us under different Domain Name which is those company provide web hosting and advertisement service. There are many web sites under the each domain name and we do have monthly database on number of visitor for each domain name. Figure V.6, on the figure shows monthly online visitor for each domain name. LinkExchange Network (174 percent of growth rate of online population since August 1998), 24/7 Media (87 percent online users population growth rate), Xoom Network (43 percent), DoubleClick (66 percent growth rate).

US online users Web Site preference plug into the Figure V.7. The most attractive or useful web site category is Search engine web category. 15 web site category users population increased steadily. August 1998 total online users population were 60 million and for each web site category average online users less than 20 million. End of December 2000, total online population was 80 million and average online visitor for each web category were 40 million. Art&Entertainment, Search Engine, and Computer Technology web category were the most popular sites.

On the Table V.1 top three popular web categories ranked among the 15 web sites by region. First region on the table is New England. In August 1998 6 million visits to Search engine, second highest interested for Art & Entertainment 3 and half million and Third highest category for Computer & Technology and 2.9 million visitors. During 1999 travel, Art, and

Search engine category most popular sites. Year 2000 in New England online users interest shift to Business & Finance web category, Art and Travel web site. On the table listed for each region to show first three highest preference web site names. Table V.2 give us idea the most Internet users comes from which region base on date. At the first time of data we found East North users more active and live their online users are more than any other region's online users population. Online users population become dominates in Pacific region. As we define second essay pacific region is the most attractive region for online sector.

US census 2000 and Media-Metrix 2000 comparison listed on the Figure V.8 through Figure V.12.First Figure V.9 plug in to their US2000census population for both Male and Female age is over 18, Figure V.10 second data from Media-Metrix for December 2000 online users population for each gender. 100 million men age is over 18 and 30 percent of US male population using online (31 million men 18+). 108 million women age is over 18 and 31 percent of women population in US using Internet. Percent distribution by age bracket for both gender also listed on the Table. 48 percent of Women 18+ and 46 percent of men 18+ and age bracket 25-49 the most popular online users' age level. Second active age group for both genders is 18-24 age group online users.

Figure V.11 and Figure V.12 last US census shows 22 percent of family income level is within $50-$75K. Second highest income group is $35K-$50K by 17 percent. Media Metrix data finding is 26 percent of online users income level within $40K-$60K, 29 percent of online users income level is less than $40K. Lower income family is using more Internets.

Figure V.13 and Figure V.14 briefly shows distribution of population by region using US-Census 2000 data and Media Metrix data. 40 percent of online users from New England, 38 percent from West North Central, 30 percent online users from Mountain, 32 percent from Pacific region. 5 percent of US population lives in New England area and 40 percent of New England population connects to Internet. 16 percent of US population lives in Pacific region and 31 percent of Pacific region residents connect to Internet. More than 14 million people are using Internet in pacific region.

Chapter VI

6.1. Summary and Conclusion

The Internet has become a tool that is accessible to and adopted by Americans in communities across the nation. Approximately two million more people become Internet users every month, and over half of the population is now online. 30 percent of online users on the live in US, dominant language is English. Male spent more time online at home than women, averaging 11 hours and men viewed 40 more pages on average than women, 801 pages versus 573 pages. 12 percent of online users are teenager, its faster growing online users population recent years. The biggest percent of online users' income segment bracket is ($25K-$60K) it's around 28 percent. Lower income level people interest growth much faster than any other income group. Two-person household is 20 percent of whole online population and fastest growing household size is one-person household. The most active online users' population lives in Pacific region, almost 20 percent of US online users live in pacific. US web surfer-visiting average 30 web pages daily in August 1998 and then start increasing to visiting more web page and end of December 2000; they visited almost 50 pages per day. Monthly average minutes spending 625 in December 2000. Top three-web page category is Art-Entertainment, search engine and computer &technology.

People of lower income levels, lower education levels, or the elderly are among the fastest adopters of this new technology. As a result, we are more and more becoming a nation online: a nation that can take advantage of the information resources provided by the Internet, as well

as a nation developing the technical skills to compete in our global economy. The expanding use of the Internet at schools, work, and libraries has played a significant role in this development. Young people are now active users of this technology. This report has demonstrated that the presence of computers and Internet access at schools is making these resources available to children who lack them at home. This means that our children will gain the skills and familiarity with new technologies that will allow them to find jobs in our new economy. Spent time online and visiting number of web site, duration time, online population all together increased steady rate during August 1998 to December 2000.

Americans has passed a significant milestone now that the majority of Americans use computers and the Internet for their daily activities. This trend is enriching our world, facilitating our work lives, and providing a skill set needed for a growing economy.

6.2. Appendices

6.2.1. Demographics

Location of Use: Home versus Work. All college usage is classified into the Home category.

Household Size: Total number of persons in the household, regardless of age or Web usage.

Presence of Children: Households with children under the age of 18 years old.

Household Income: Annual income reported for the household.

6.2.2. Census Regions

New England: Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont

Middle Atlantic: New Jersey, New York, Pennsylvania

South Atlantic: Delaware, District of Columbia, Florida, Georgia, Maryland, North Carolina, South Carolina, Virginia, West Virginia

East South Central: Alabama, Kentucky, Mississippi, Tennessee

West South Central: Arkansas, Louisiana, Oklahoma, Texas

East North Central: Illinois, Indiana, Michigan, Ohio, Wisconsin

West North Central: Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota,South Dakota.

Mountain: Arizona, Colorado, Idaho, Montana, Nevada, New Mexico, Utah, Wyoming

Pacific: Alaska, California, Hawaii, Oregon, Washington

6.3. Measures

6.3.1. Unduplicated Audience

Unique Visitors (000): The estimated number of different individuals (in thousands) that visited any content of a Website, a category, a channel, or an application during the course of the reporting period.

Digital Media Reach %: The percentage of projected individuals that visited a specific website, category, channel, or application among the total number of projected individuals using any Digital Media during the course of the reporting period.

WWW Reach %: The percentage of projected individuals that visited a specific website or channel among the total number of projected individuals using the World Wide Web during the course of the reporting period.

6.3.2.Frequency Measures

Average Daily Unique Visitors (000): The estimated average number of different individuals (in thousands) that visited any content of a website, a category, a channel, or an application per day during the course of the reporting period.

Average Usage Days per Visitor per Month: The average number of different days in the month, per person, in which a Website, category, channel, or application was visited. A person is defined as a visitor if they access at least one "page" of content within the Website, category, channel, or application. A day is defined as 12:00 midnight through 11:59:59 PM.

Average Unique Pages per Visitor in a Day: The average number of different URLs made per day by those persons visiting the Website, category or channel. A unique page request is

defined as a specific URL that was successfully loaded by the browser at least once in the day. Even if the page was viewed many times, the page is counted only once under the unique page request definition. In the case of non-web content, unique pages are the equivalent of unique Window Titles, if applicable, and if not, are undefined and set to zero.

Average Unique Pages per Visitor in a Month: The average number of different page requests made per day over the course of the month by those persons visiting the Website, category, channel, or application.

Total Usage Minutes (000): The total number of usage minutes spent at the Website, category, channel, or application during the course of the reporting period.

Average Minutes Per Usage Day: The average number of minutes spent on the website, category, channel, or application during the day, per visiting person.

Average Minutes Per Usage Month: The average total number of minutes spent on the Website, category, channel, or application during the month, per visiting person.

Average Minutes Spent Per Unique Page: The average number of minutes spent on each unique page during the day.

Composition: The percentage of a Website, category, channel, or application's visitors that belong to a specific demographic grouping.

Index: The composition of the Website, category, channel, or application compared to the demographic composition of the universe.

6.4.Methodology Limitations

A. Non-cooperating and non-reporting households place limitations on the extent to which the panel can be considered a true probability sample.

B. Non-cooperating and non-reporting households may have some effect on the survey results to the extent that the computer usage habits of non-cooperating and non-reporting panelists may preclude proper representation of certain household groups within the population.

C. Data obtained from the Census and Claritas are subject to defects and limitations, such as sampling, processing, and recording errors.

D. The household and person data upon which Media Metrix has based its Sample Weighting may not be precise, due to errors in the data supplied by panelists, or errors introduced during data storage and retrieval.

E. Errors in human coding of data and in transferring data between media may have occurred.

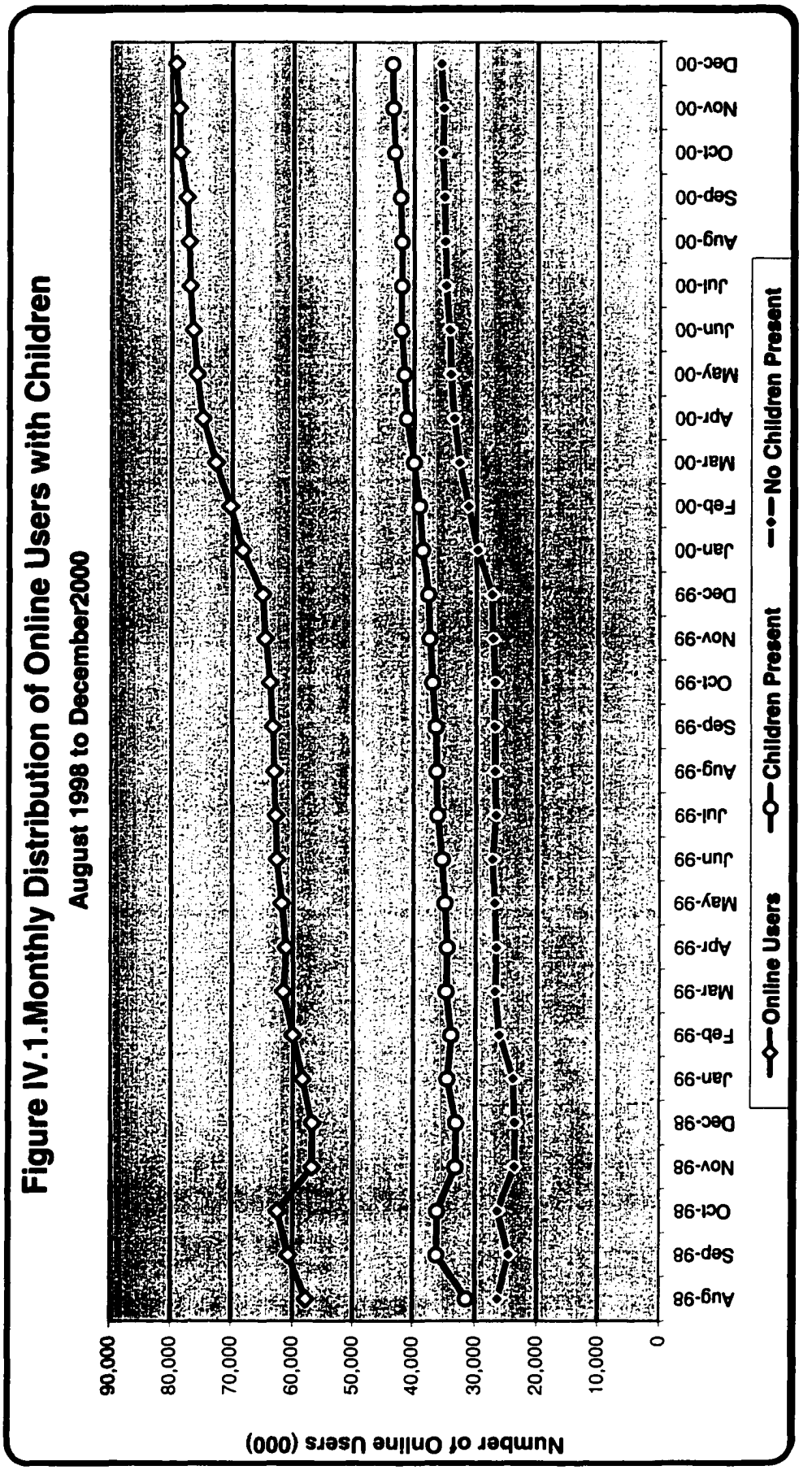
F. Logical analysis and processing of the data may affect some of the data collected before final processing.

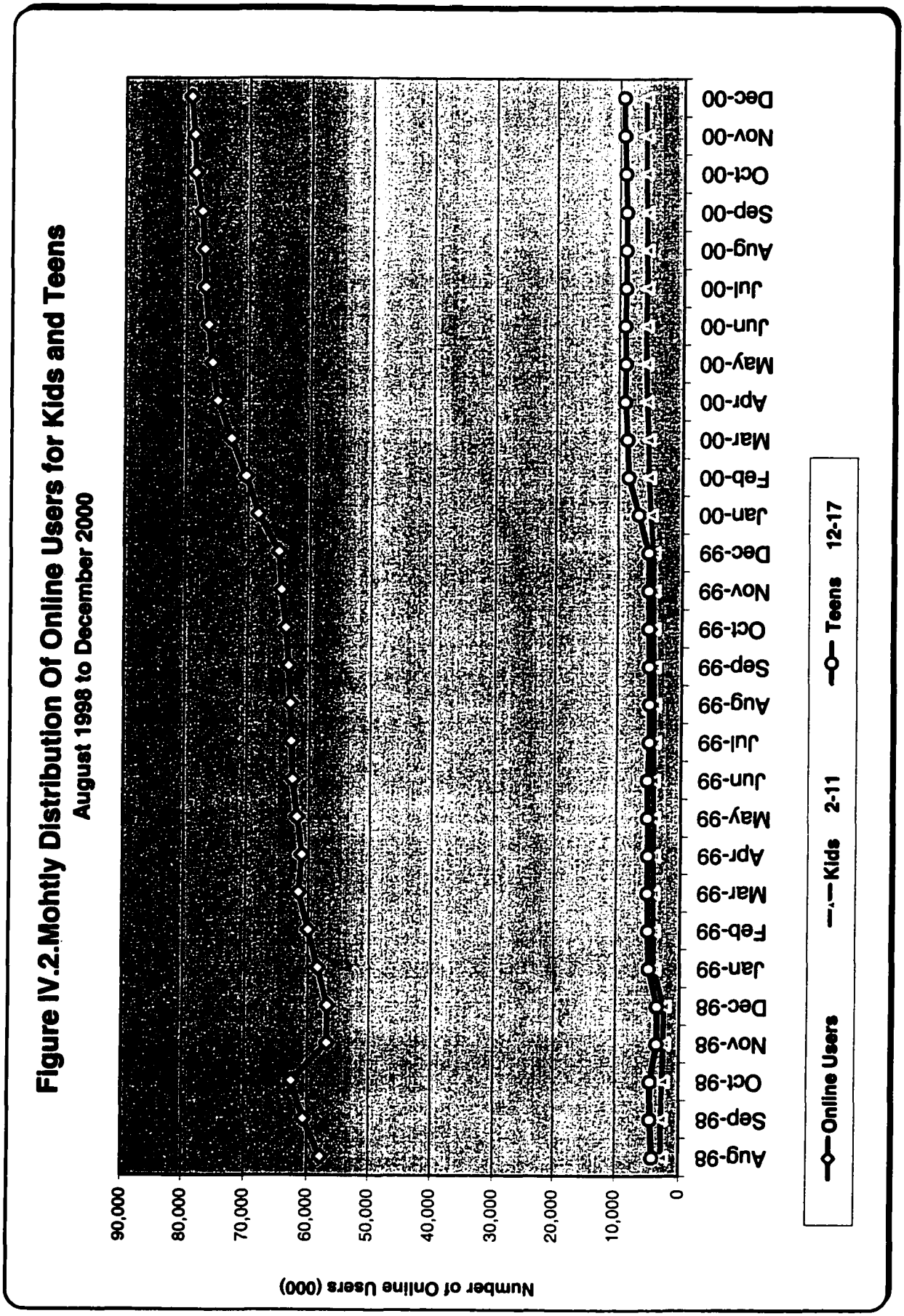
G. Usable households are limited by the ability of Media Metrix to track all computer usage on all computers where panelists may use the Digital Media applications. Although Media Metrix takes numerous steps to ensure completeness; there are instances where usage goes unmeasured. Due to some technical constraints and the possibility that panel members may not disclose all computers, or may not allow monitoring usage on all computers they use to access the Internet, 100% of all computers are not measurable. Media Metrix continues to tracking software to capture each URL on all computers. The extent to which unmeasured usage would impact the imp rove the overall Digital Media usage data is unknown.

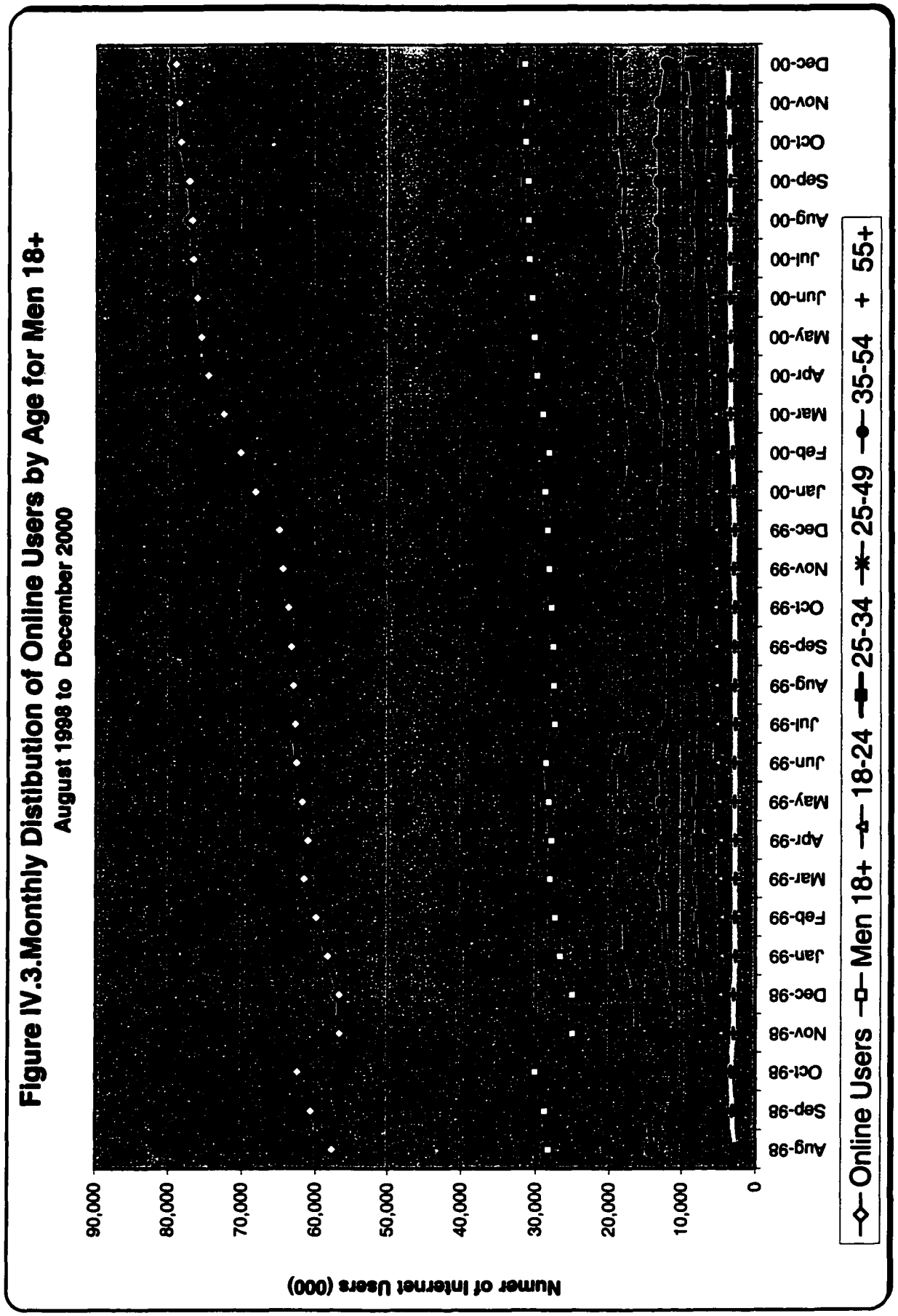
H. These data are only estimates. Due to limitations described above the accuracy of these numbers cannot be determined to any precise mathematical degree.

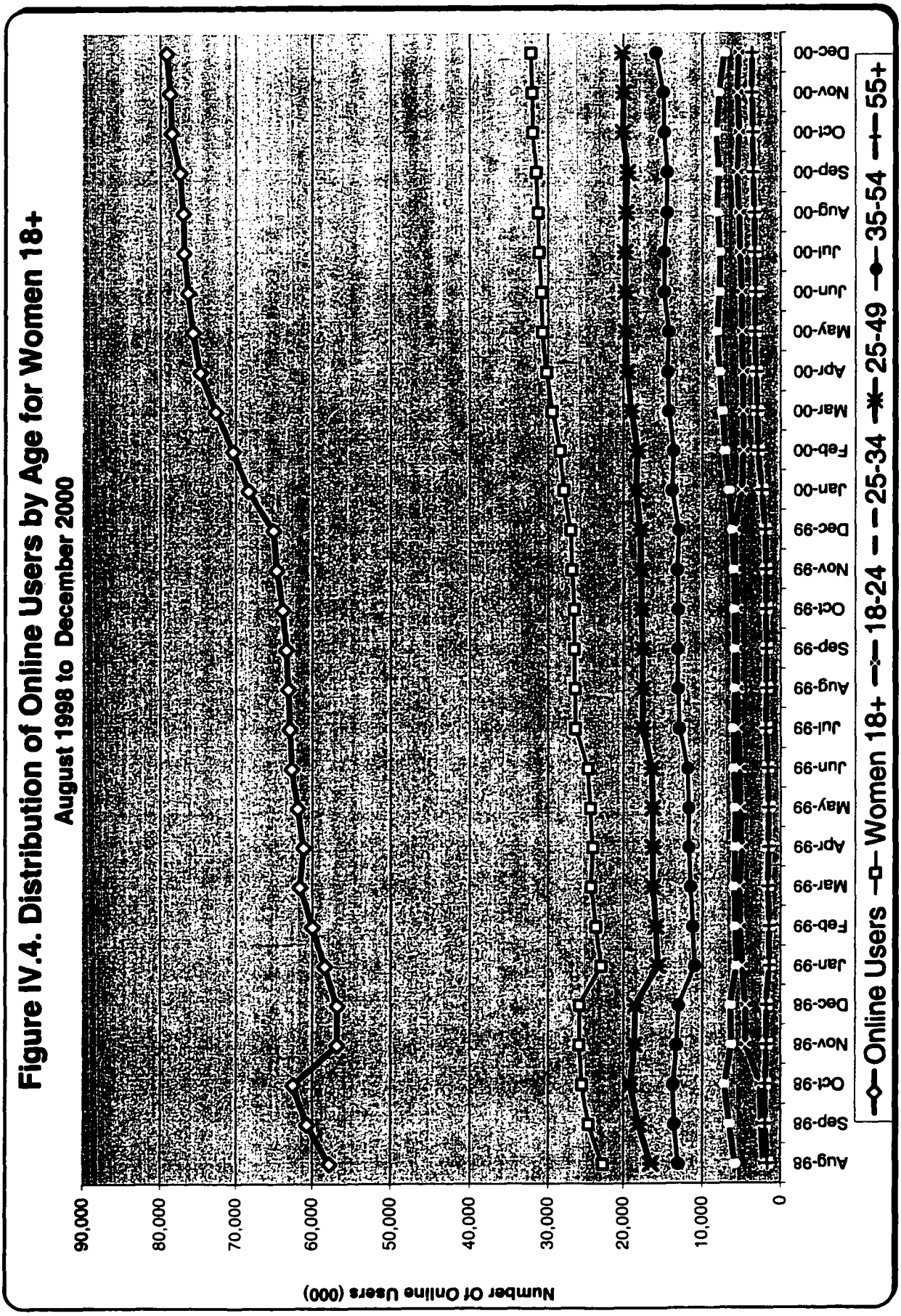
Note: Cells with N/A in the report means that the data is not applicable

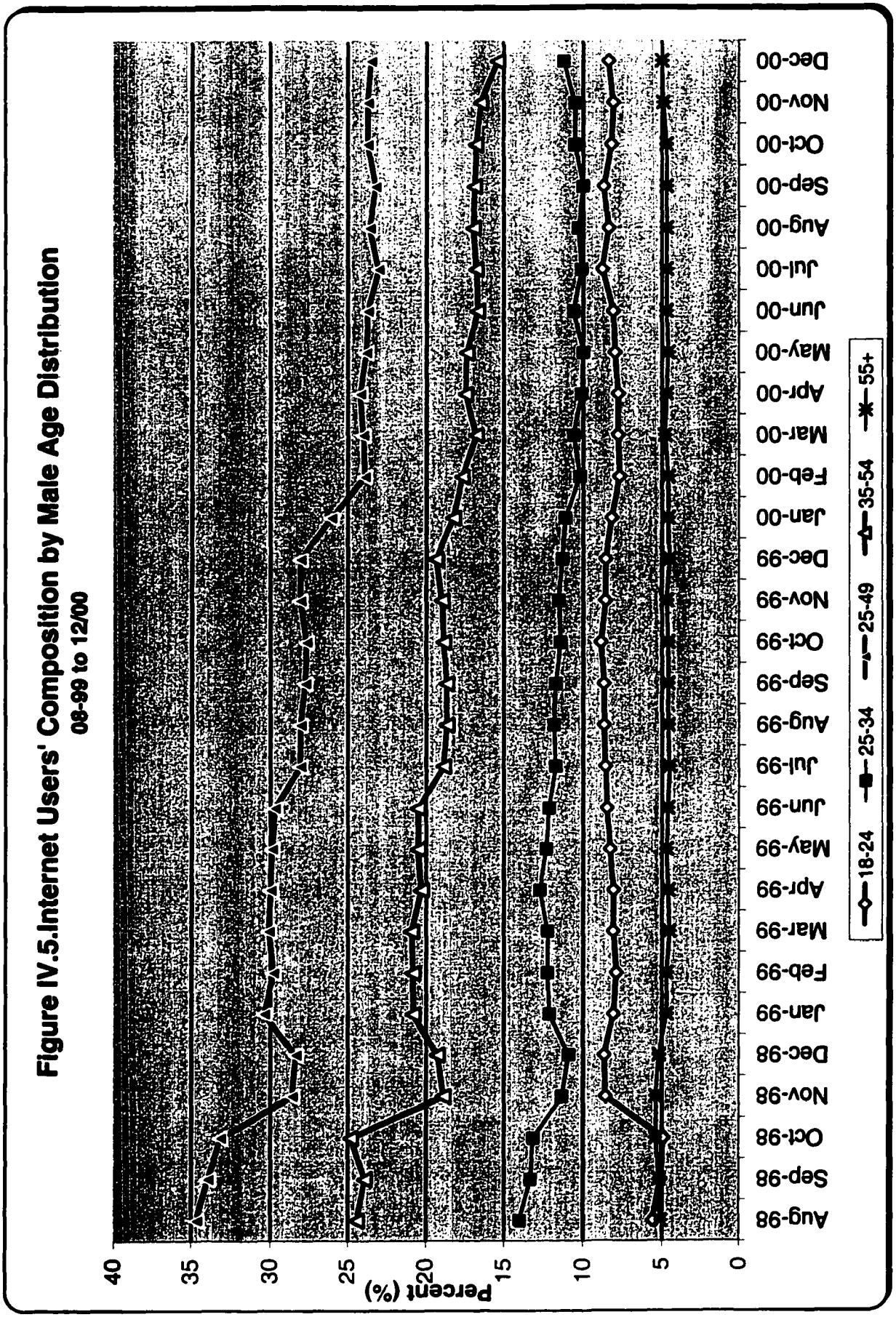
Cells with ellipses (...) in the report means that there is insufficient data.











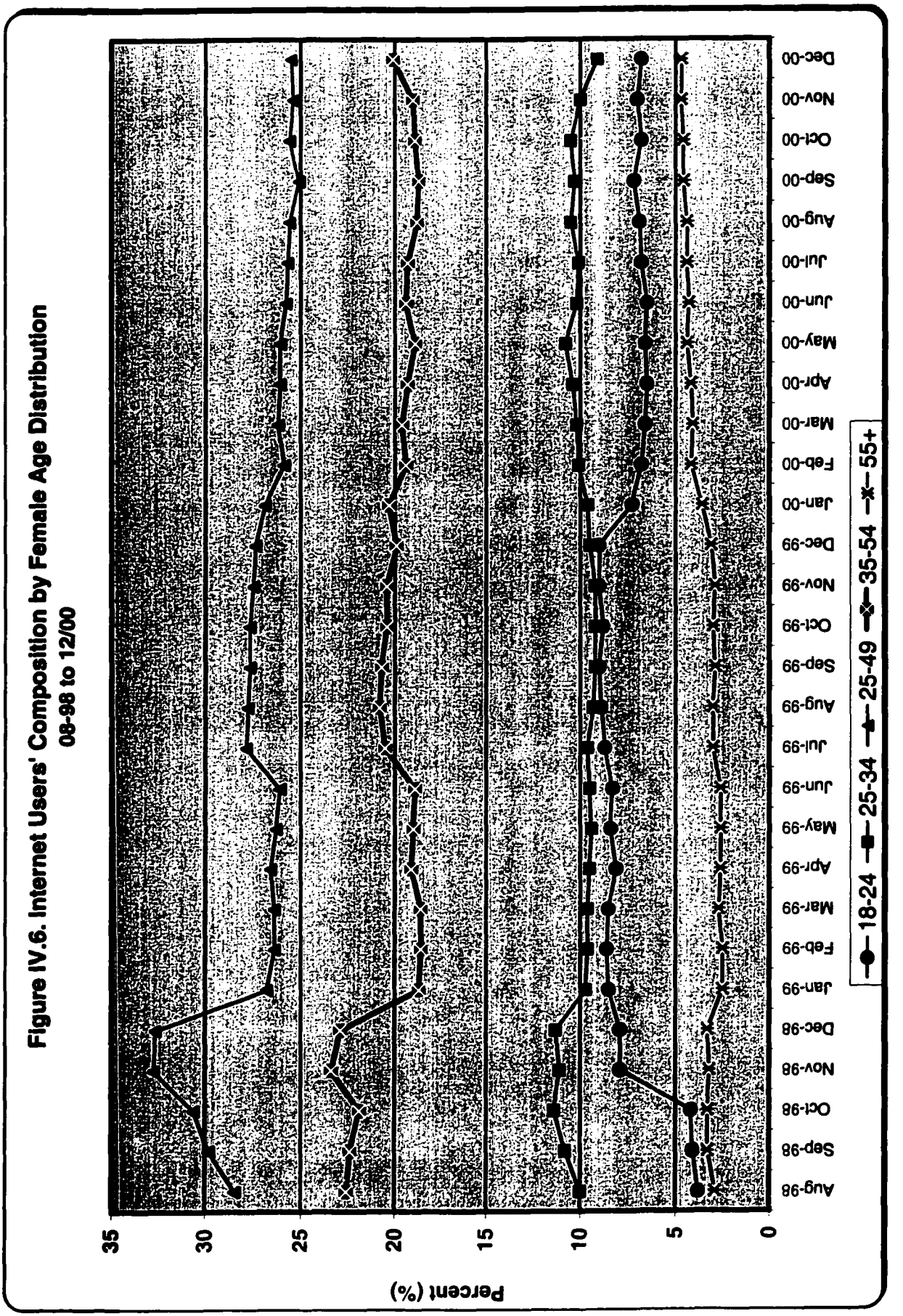
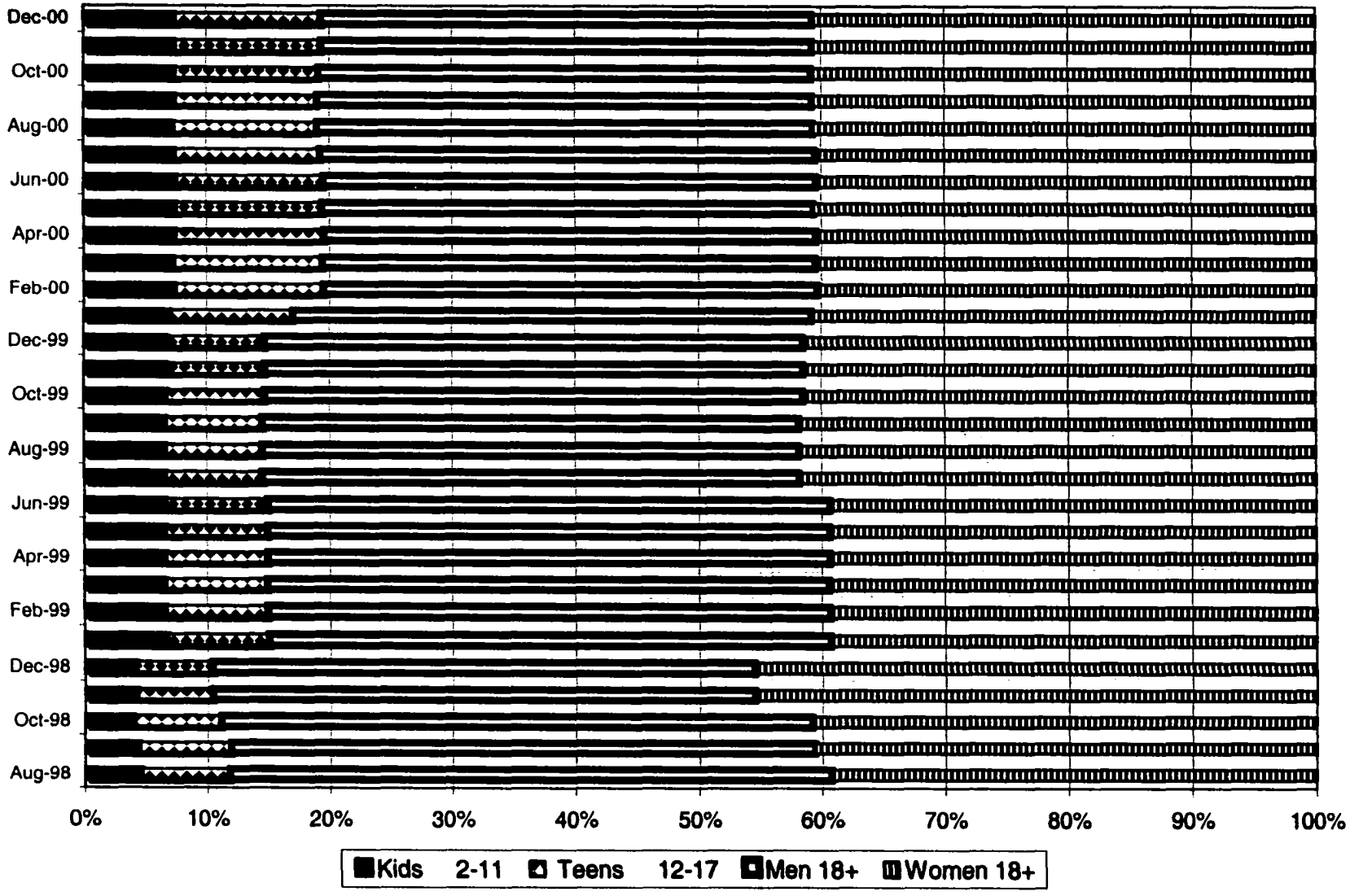


Figure IV.7.Internet Users' Composition by Male,Female,Kids and Teens (08/98 to 12/00)



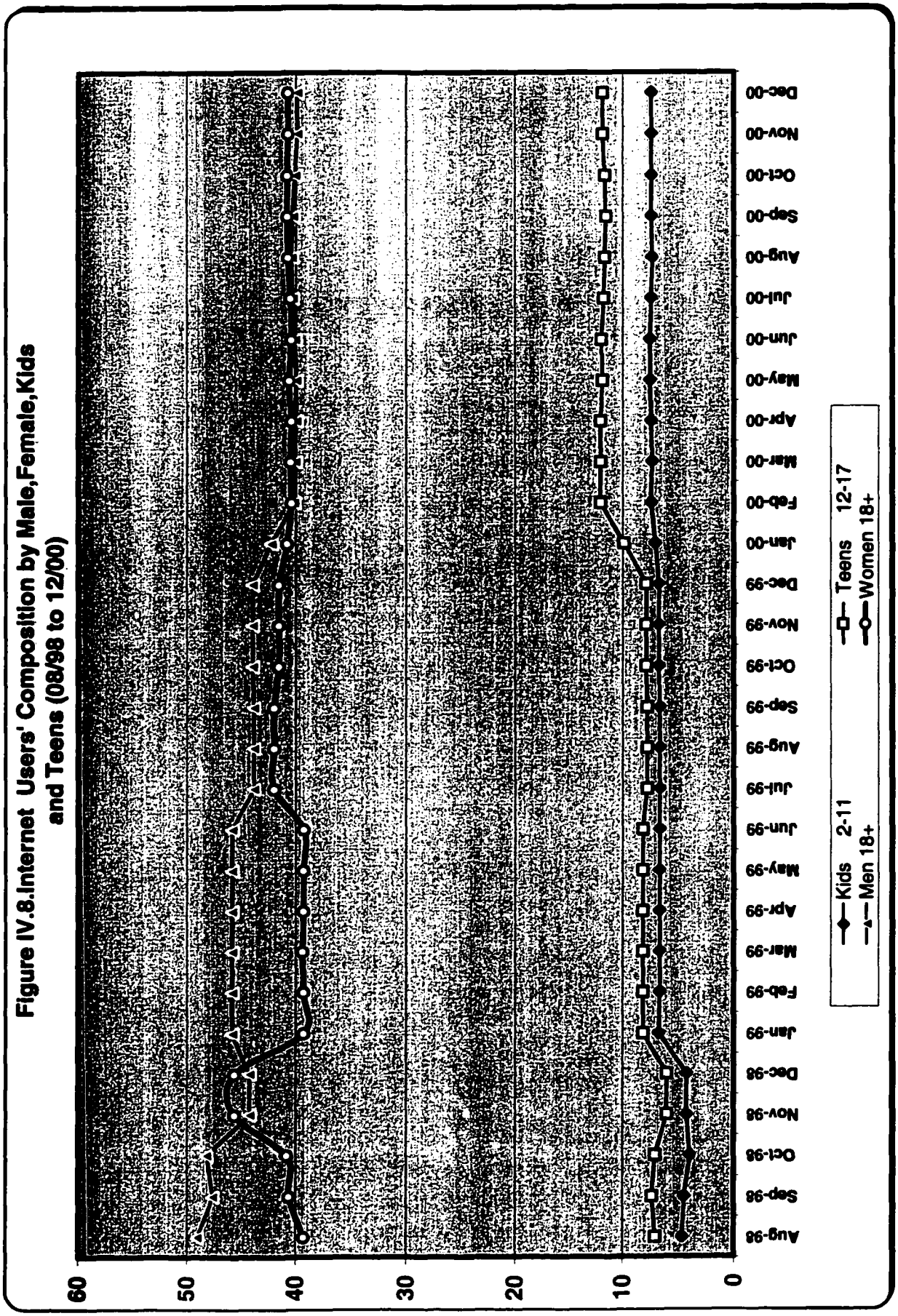
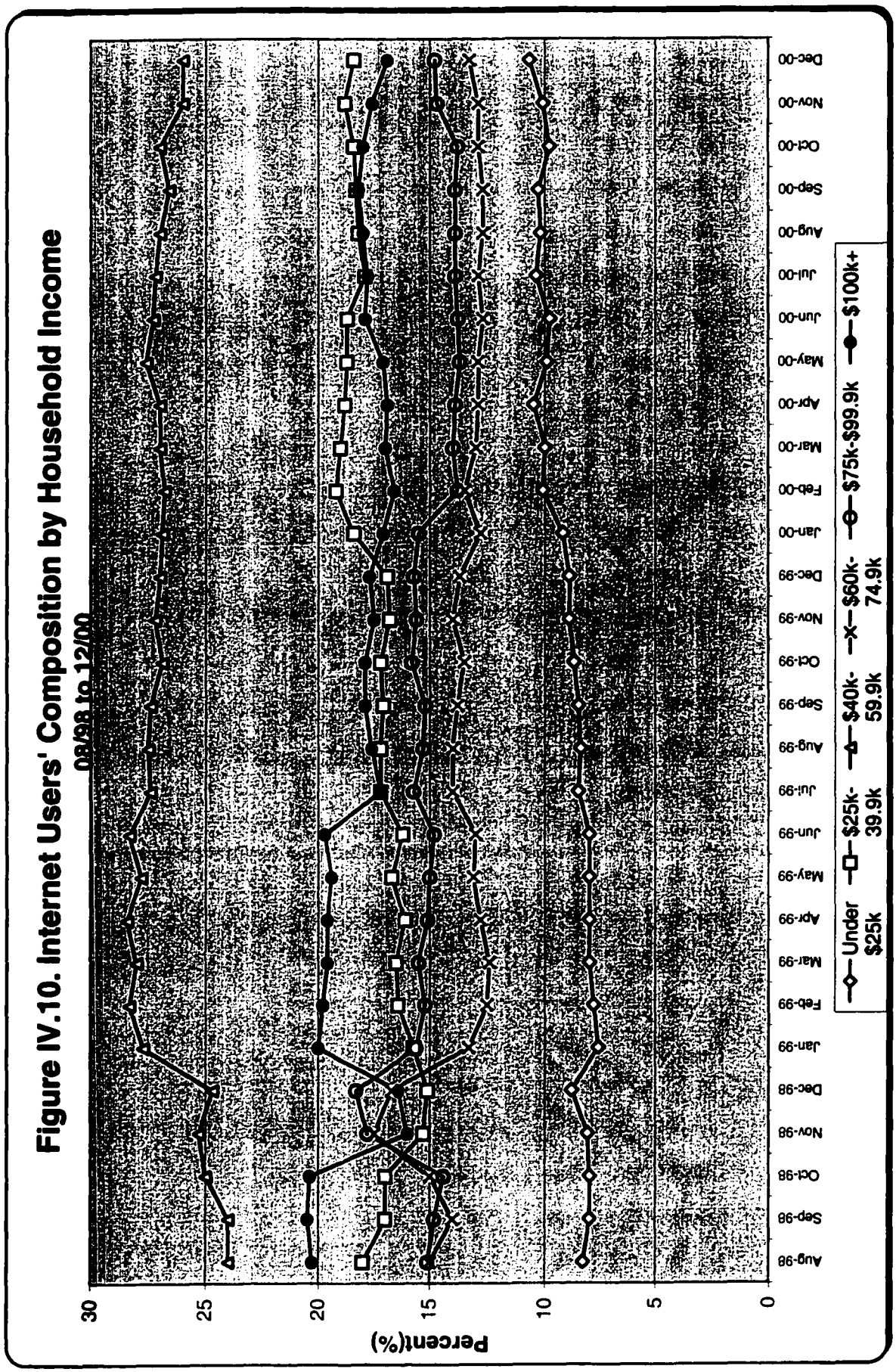
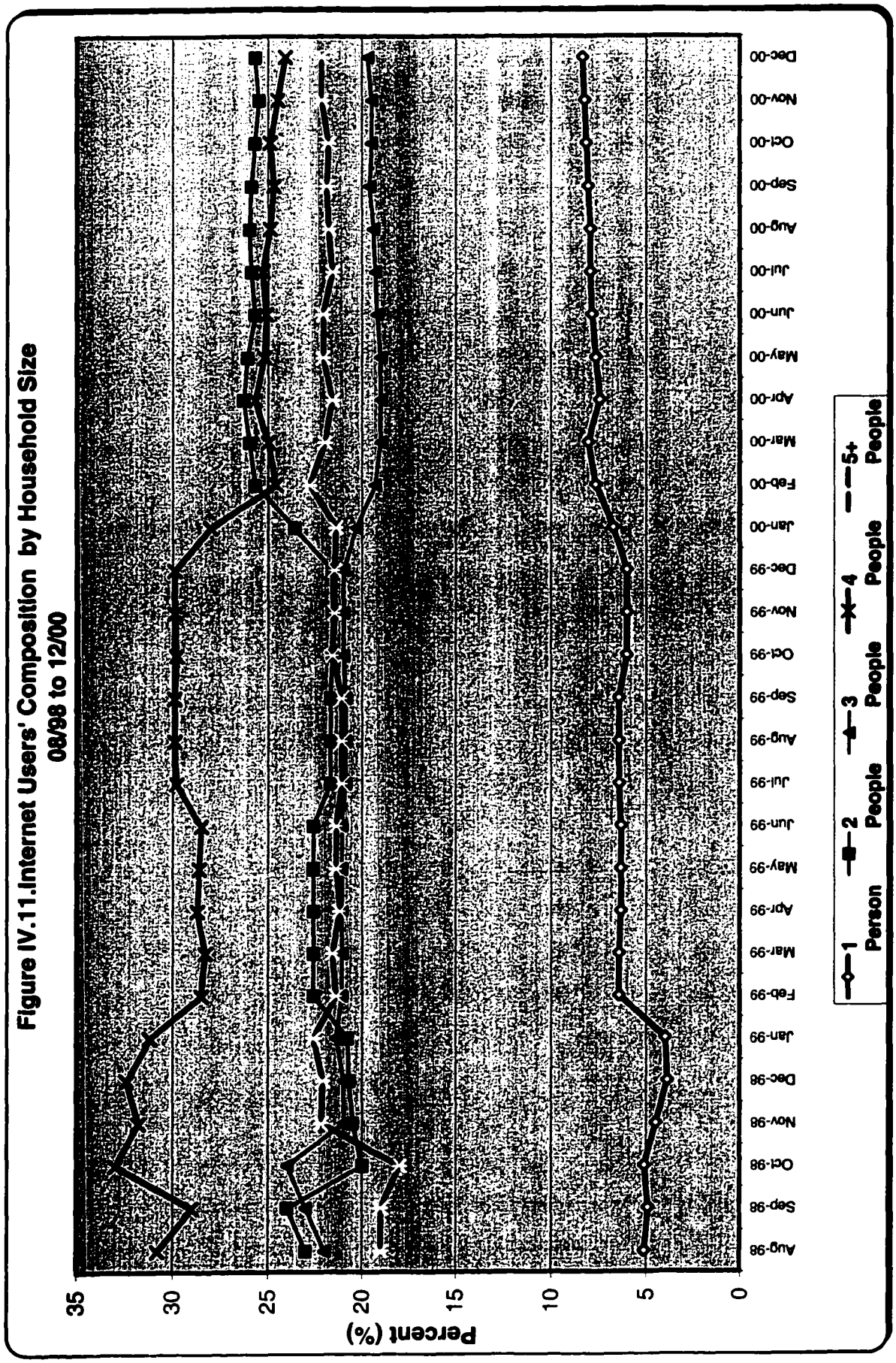
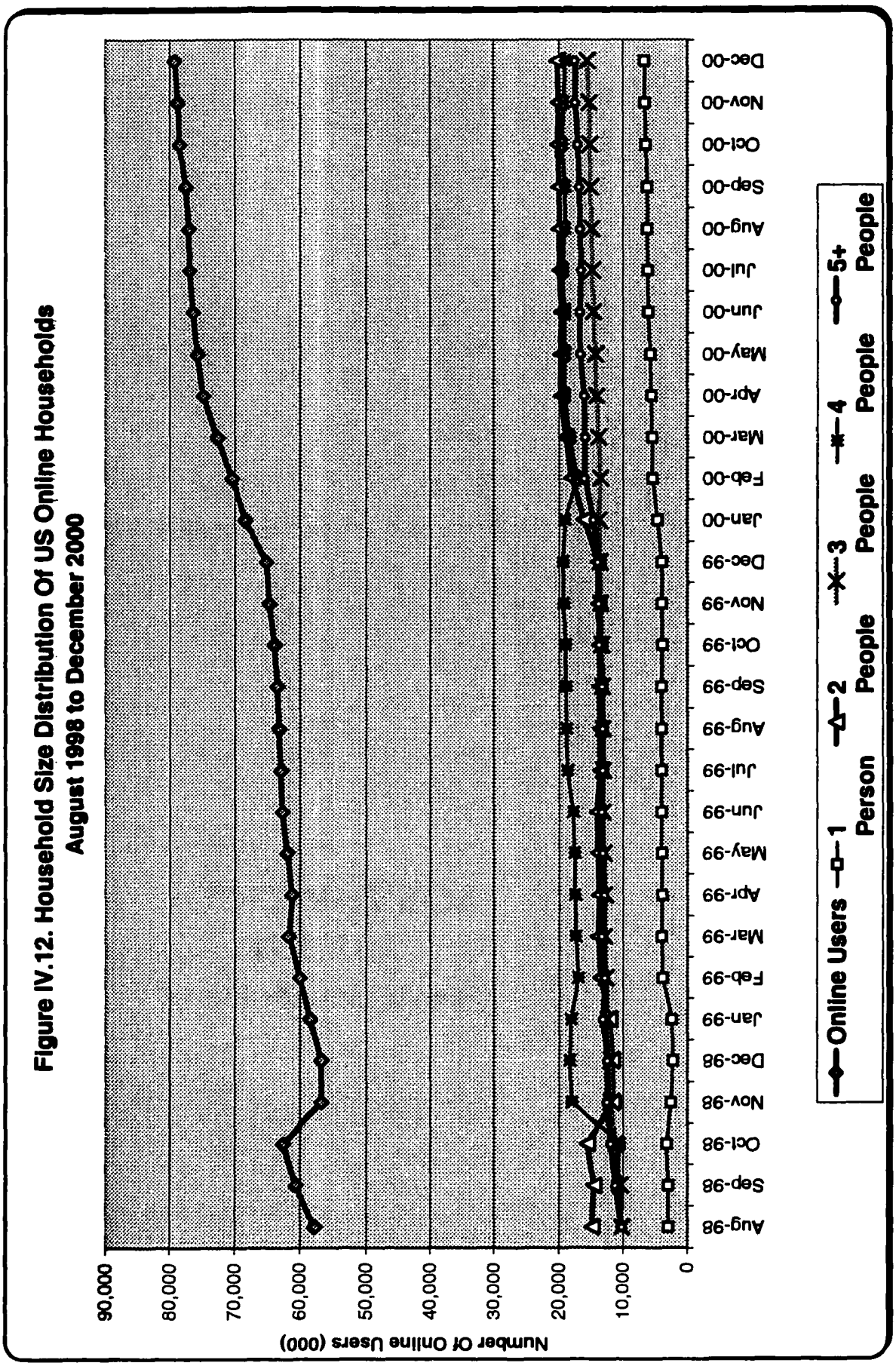
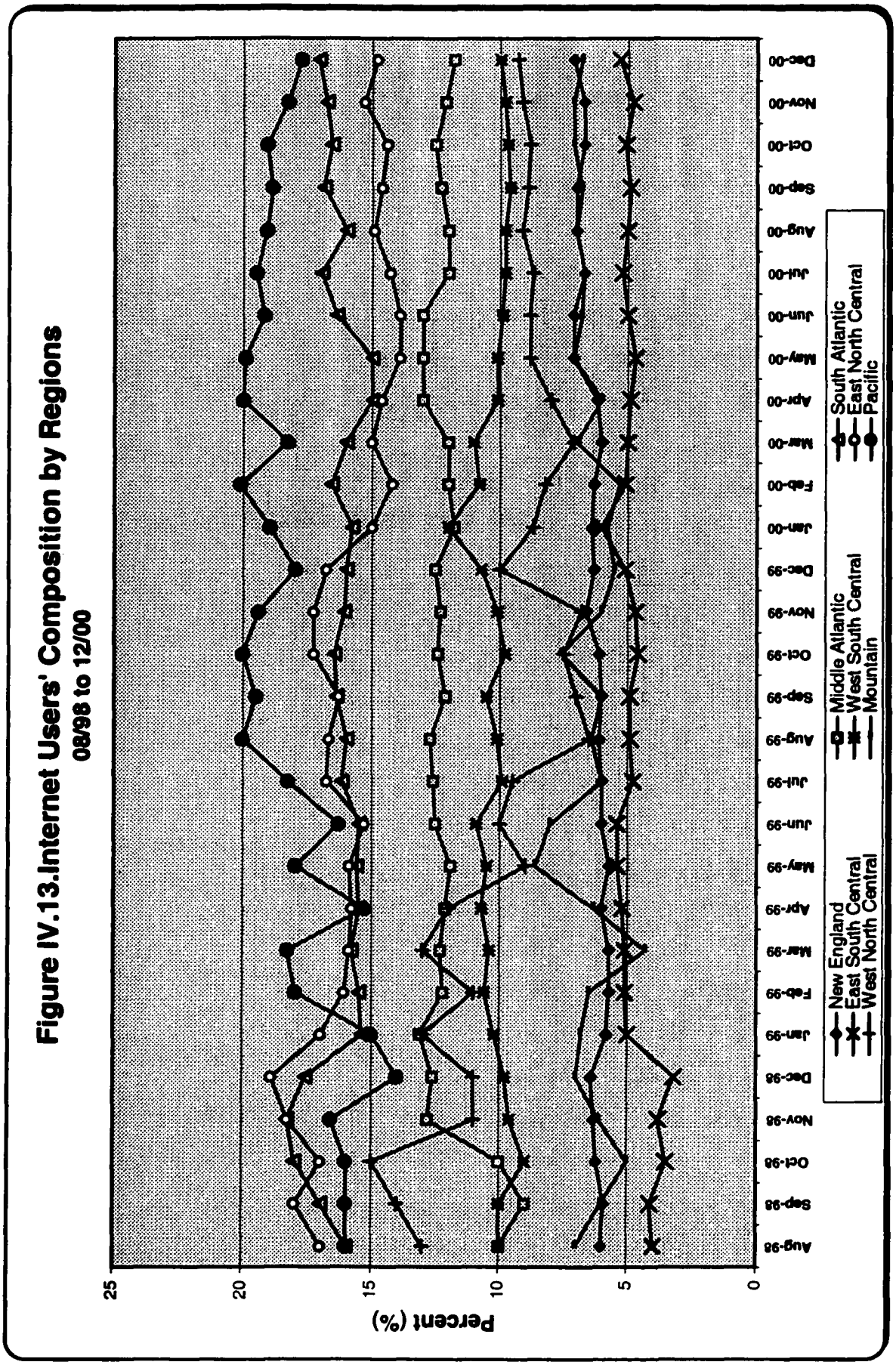


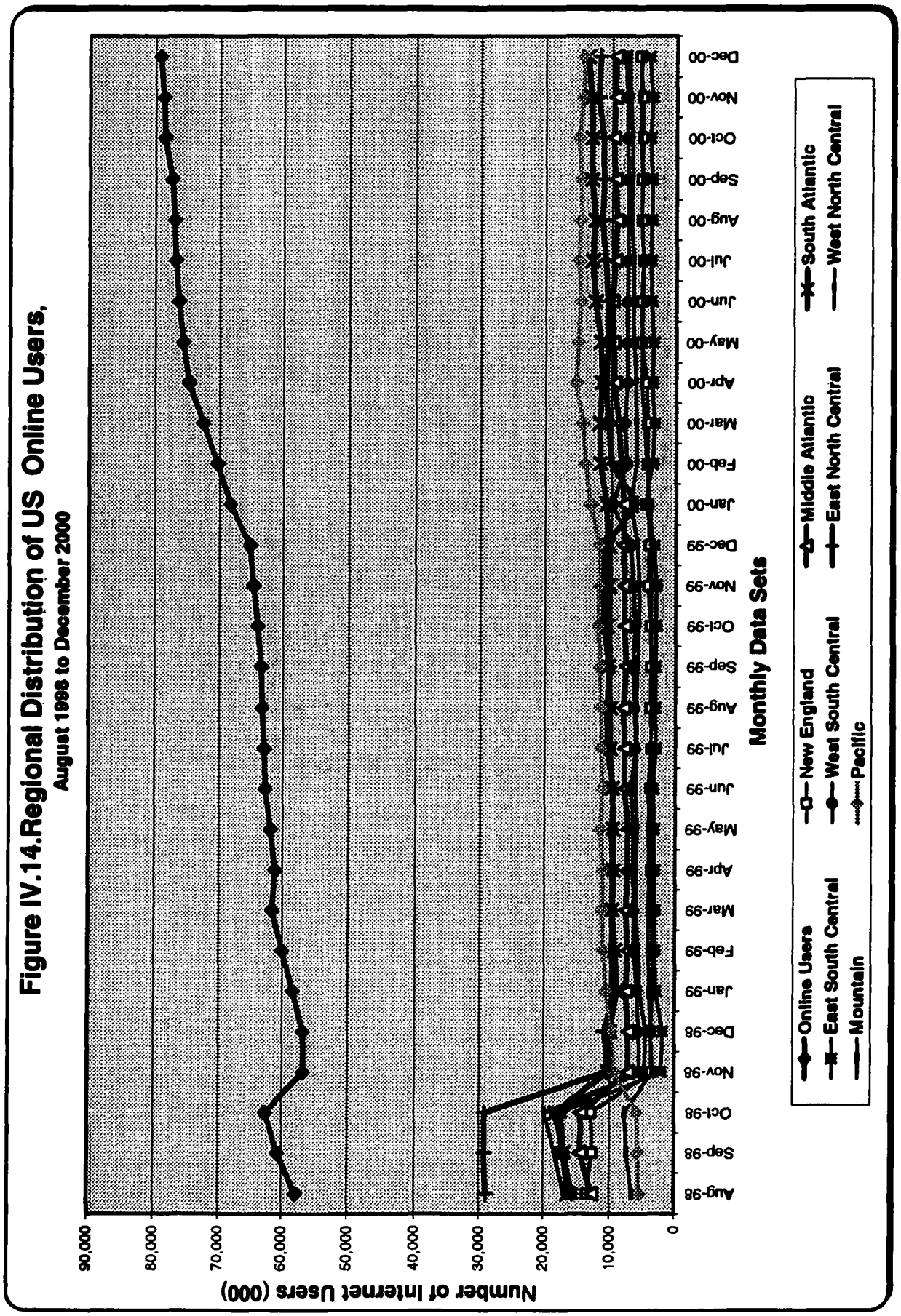
Figure IV.9.Household Income Distribution of US Online Users
August 1998 to December 2000

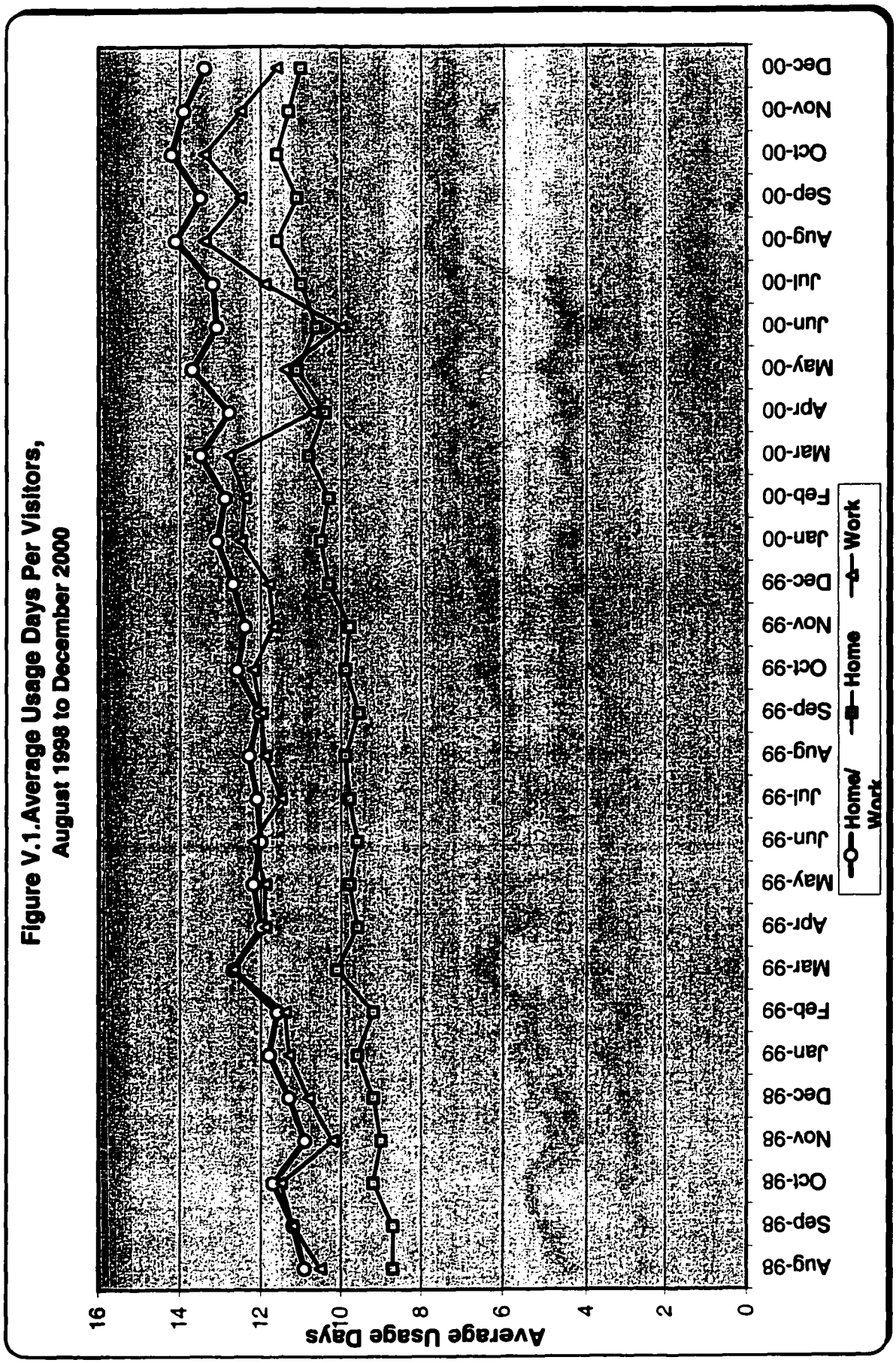


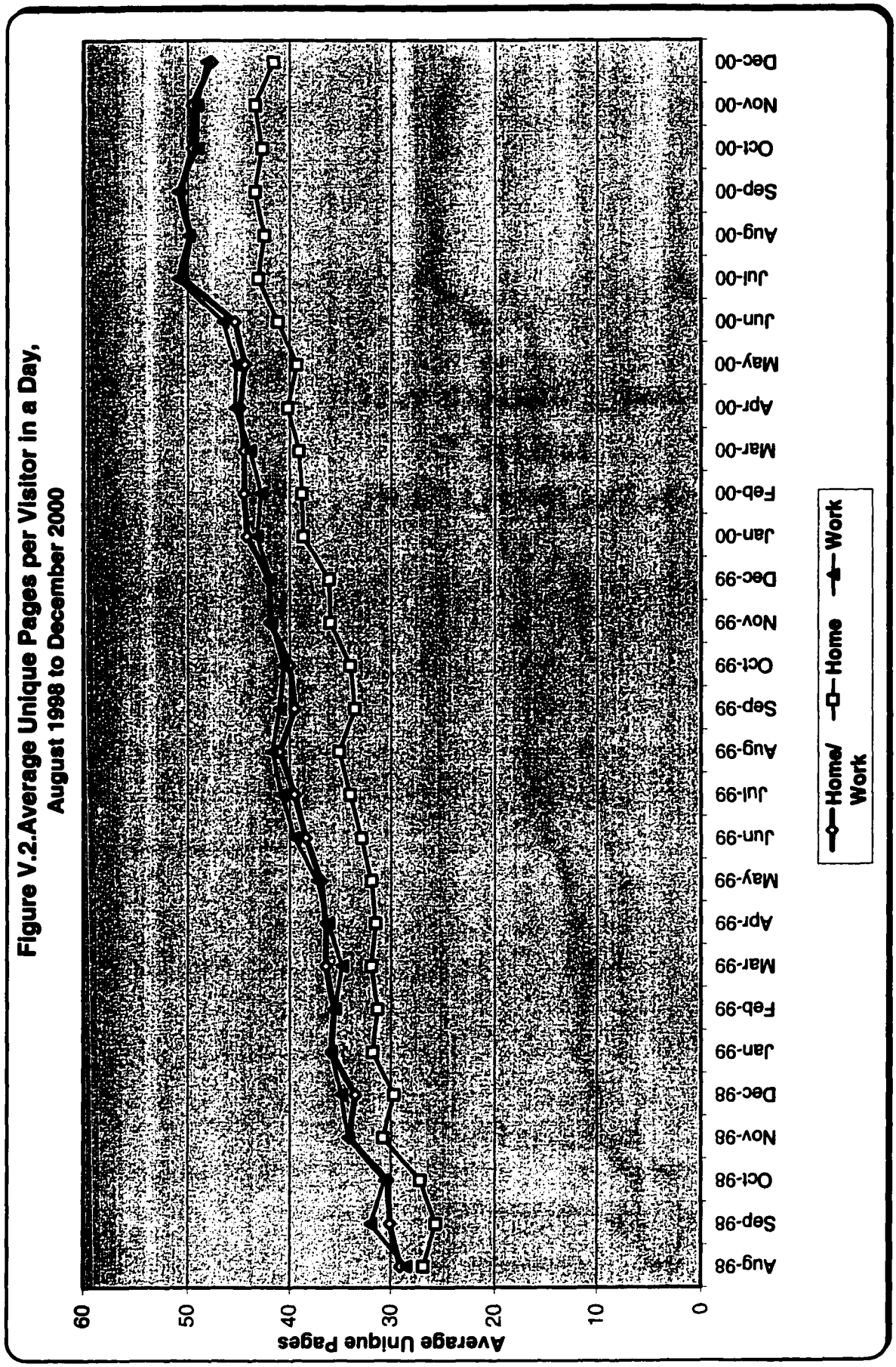


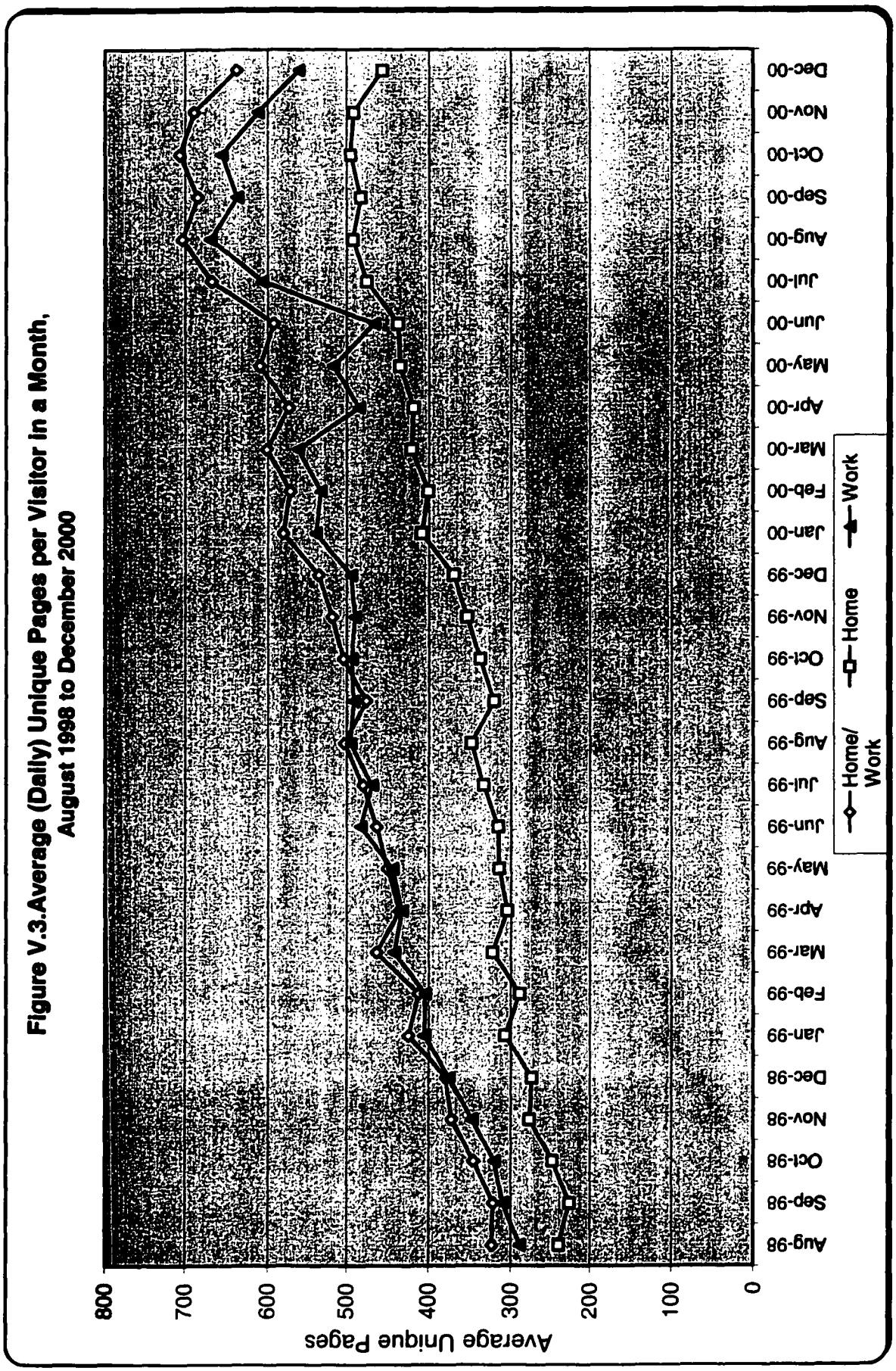


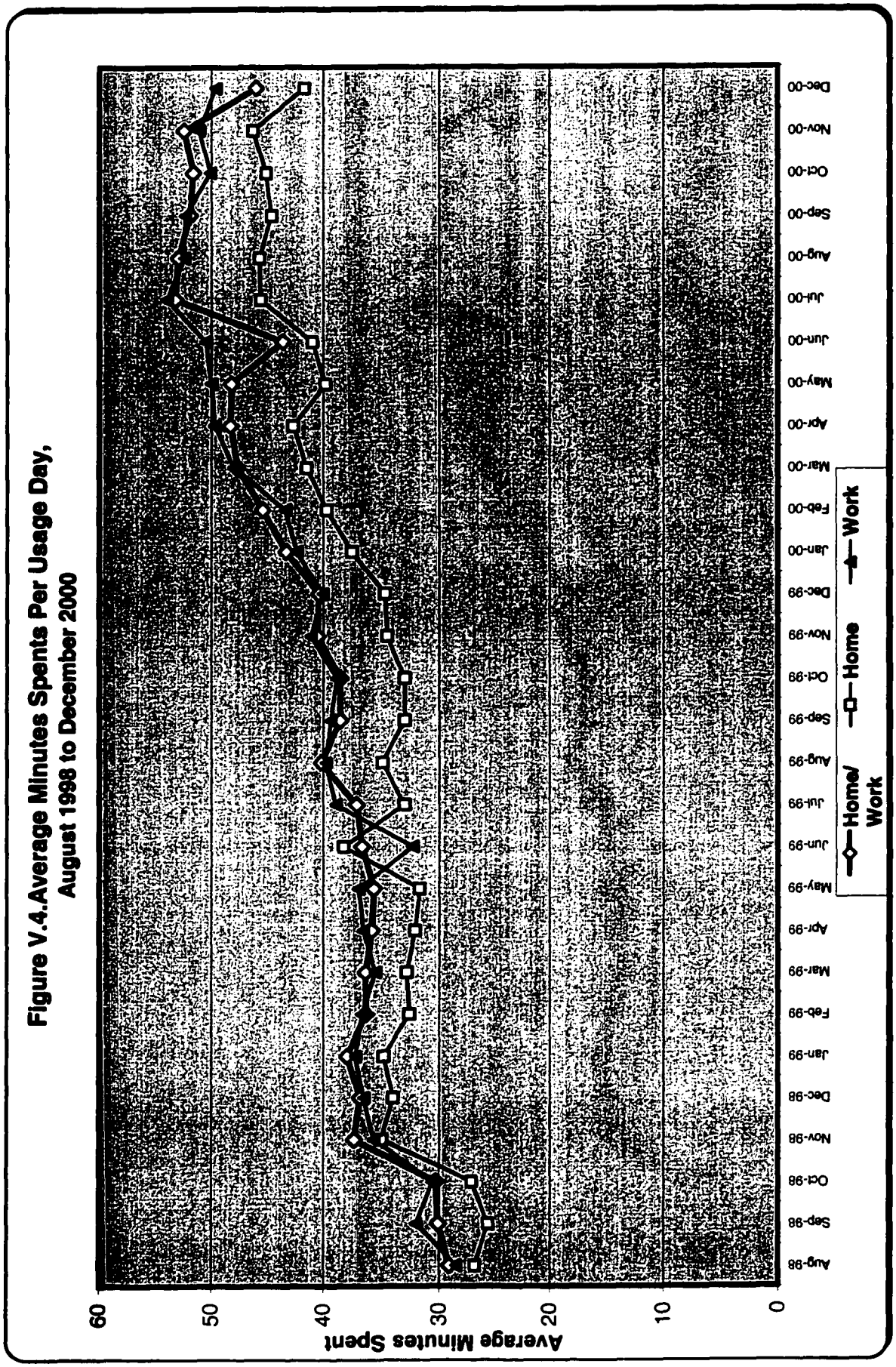


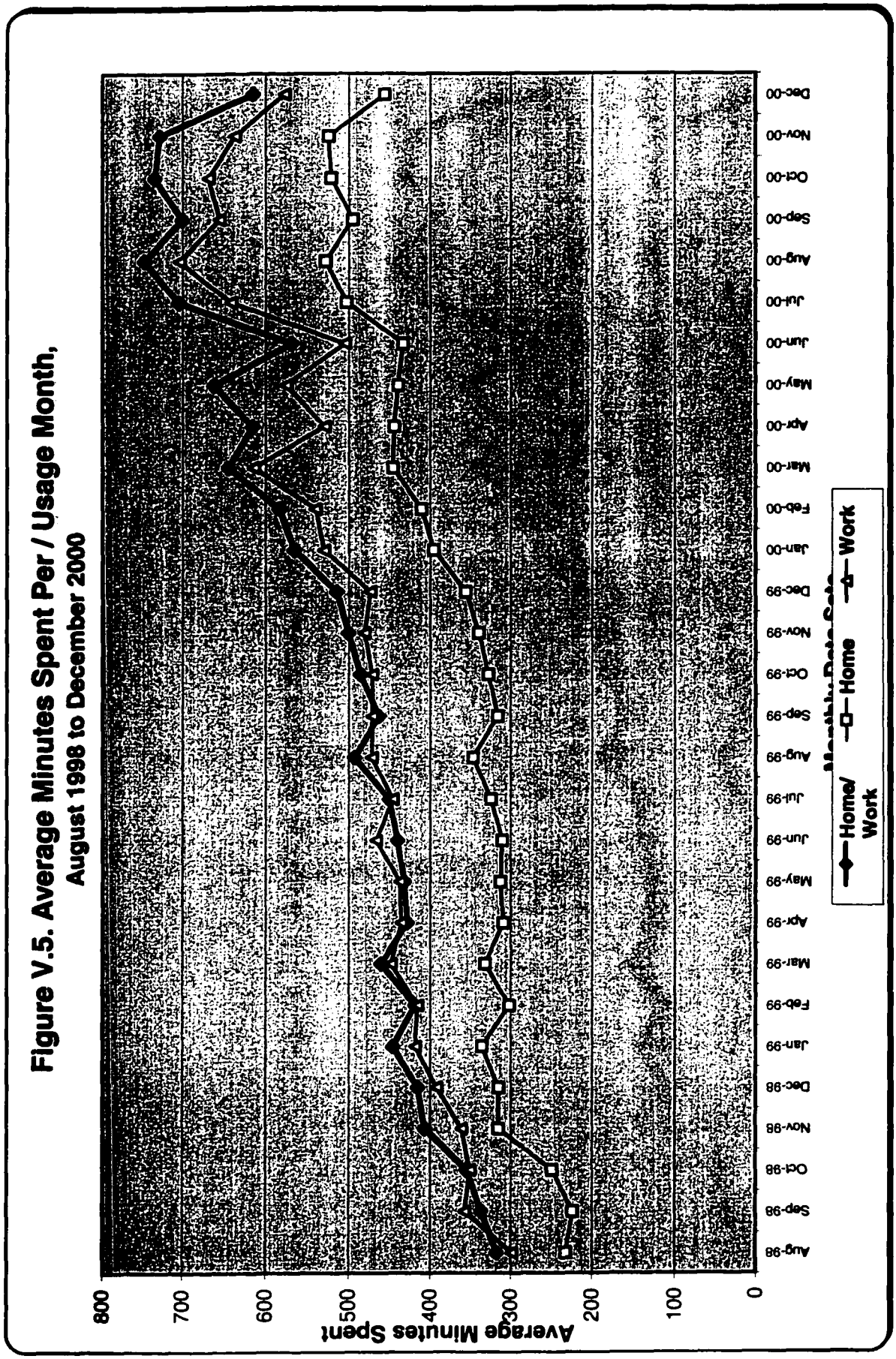


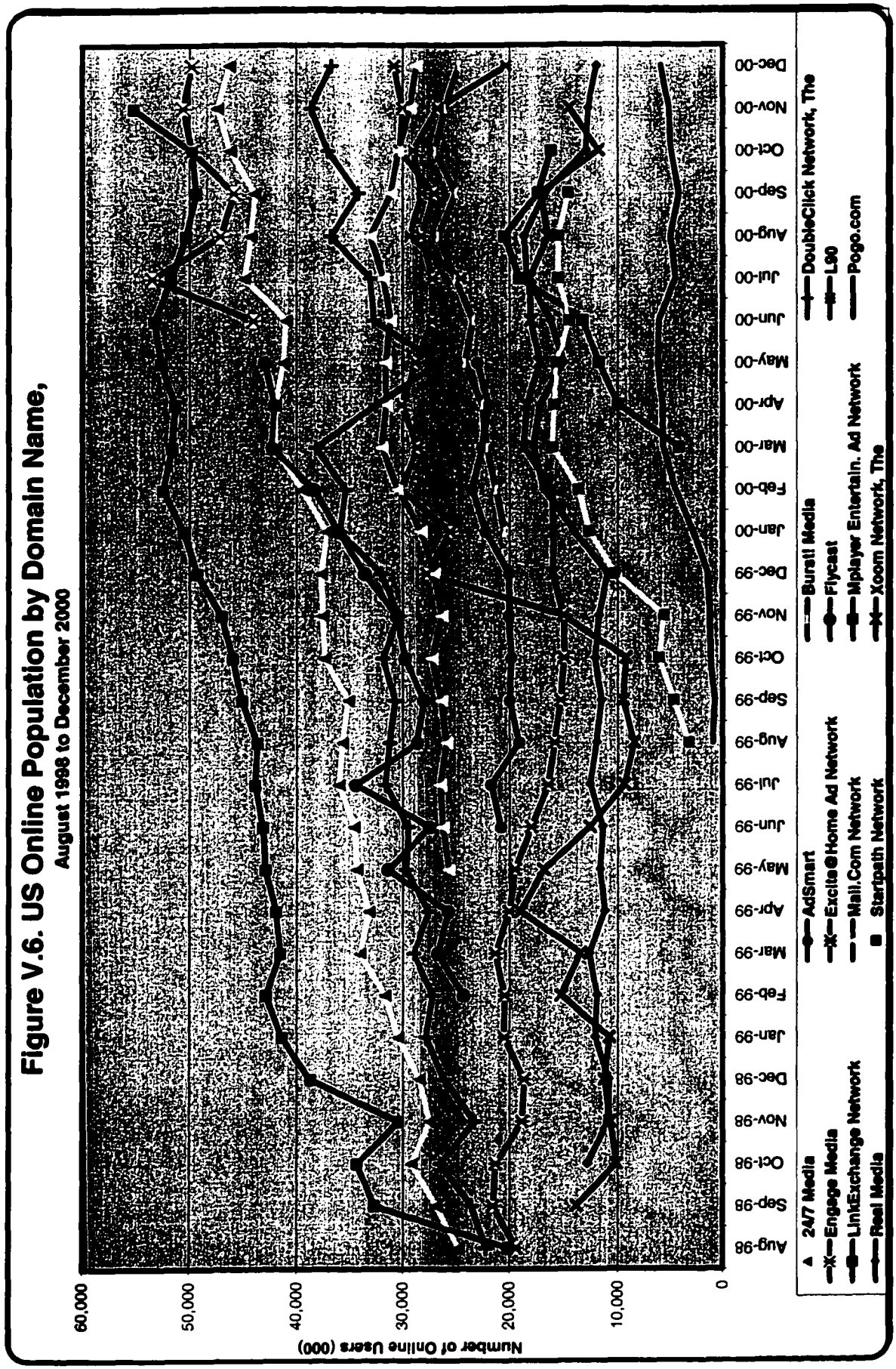


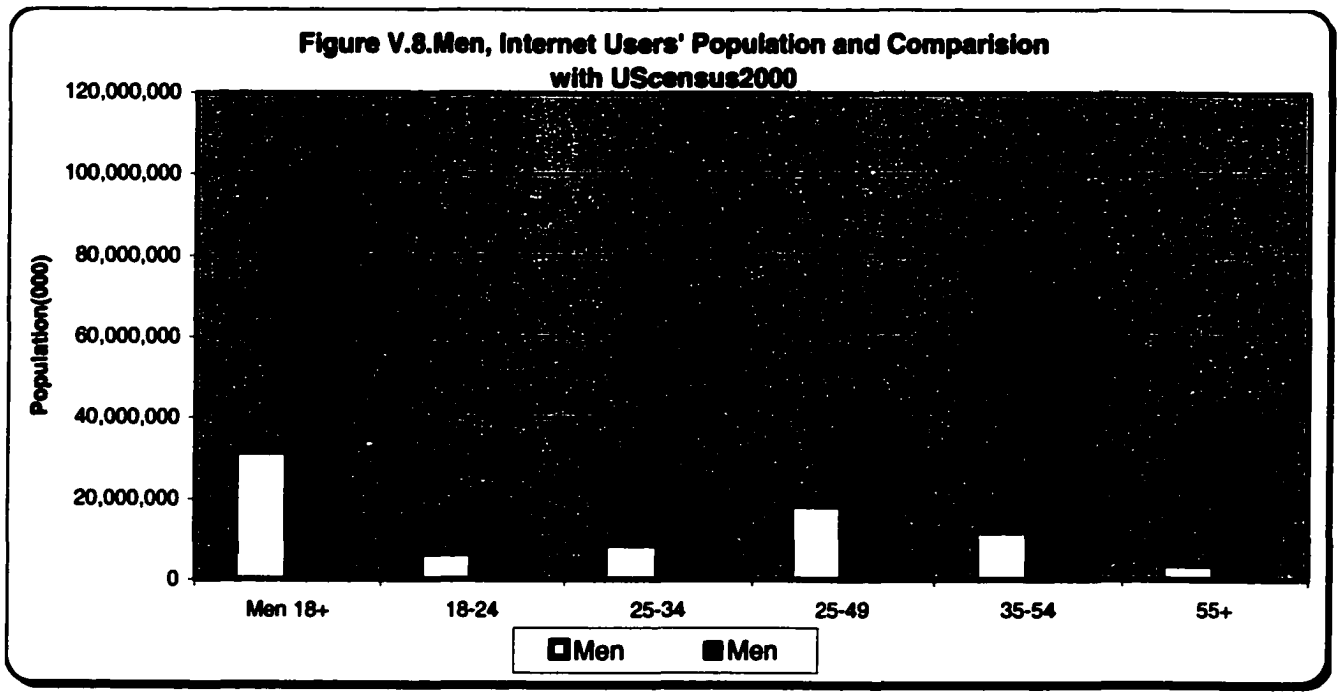


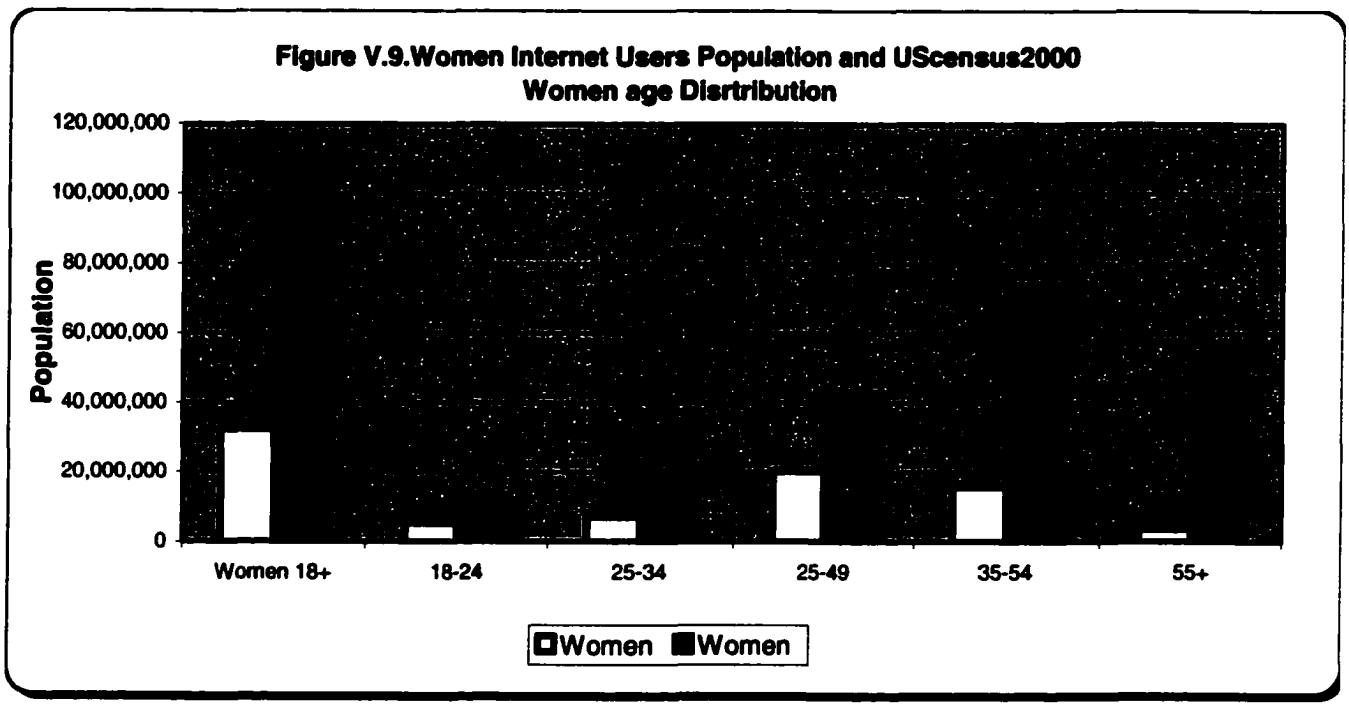












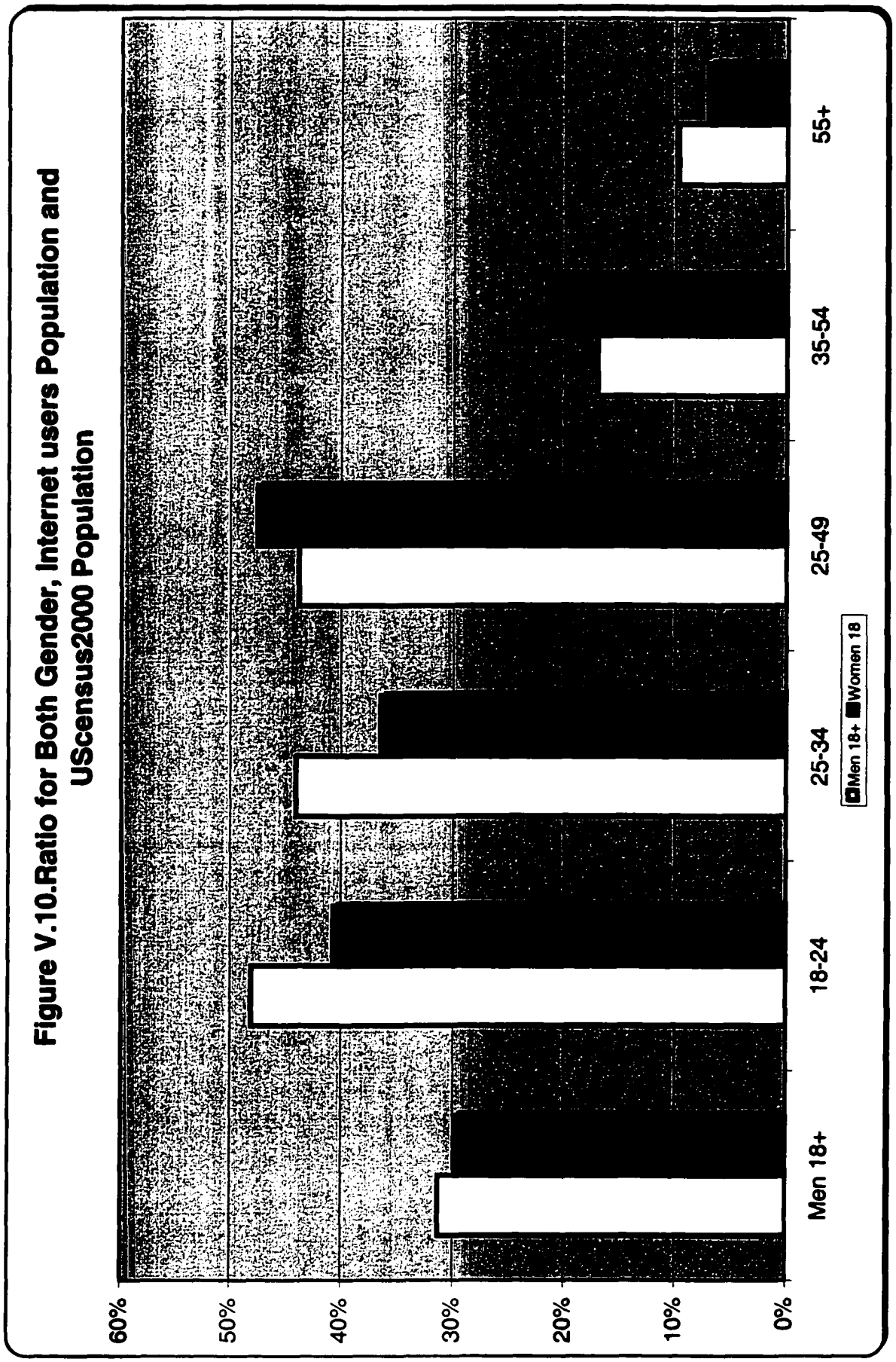


Figure V.11. Household Income Distribution base on US census2000

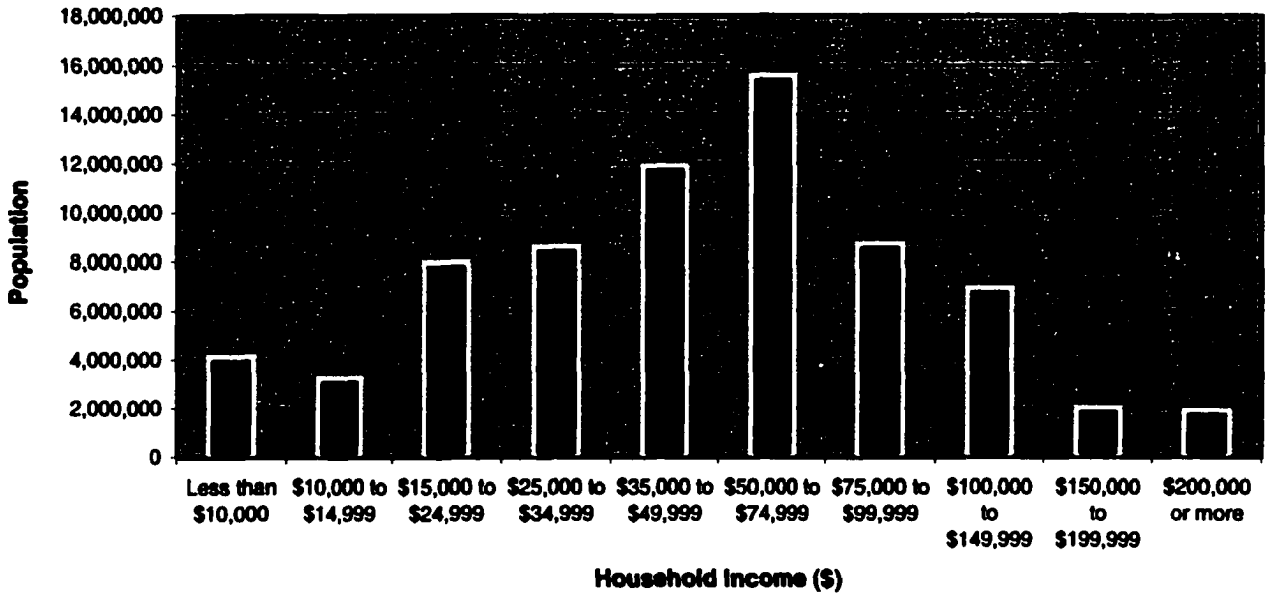


Figure V.12.Media Metrix Internet Users Household Income Distribution

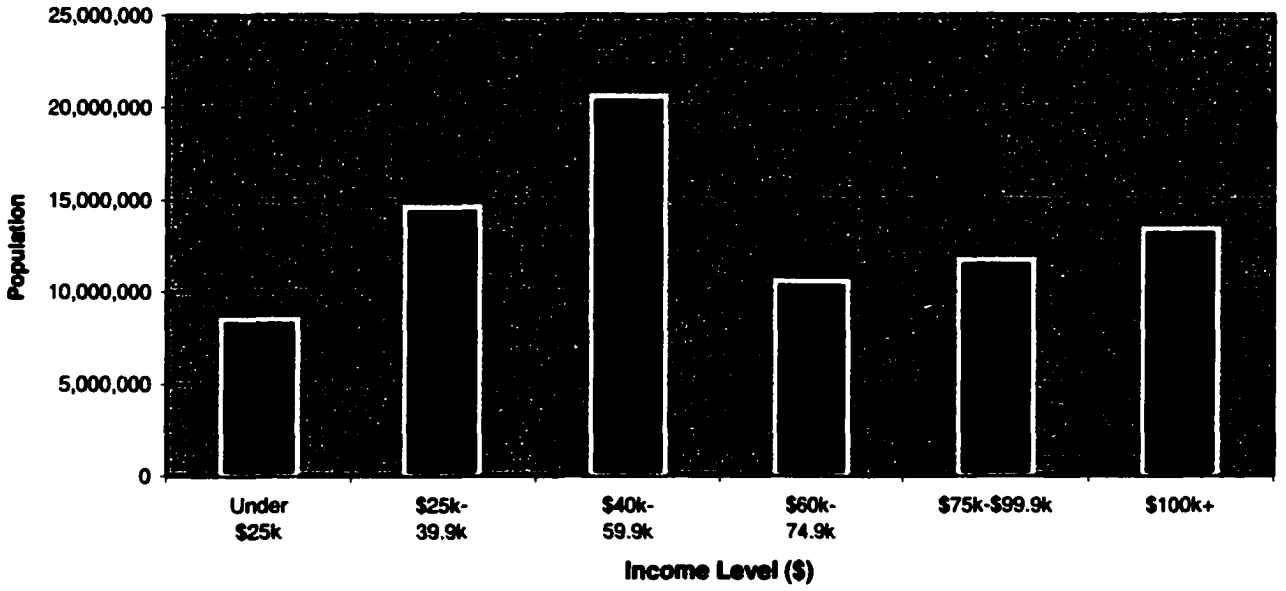


Figure V.13. US-census2000 and MedianMetrix Data as of12/31/2000

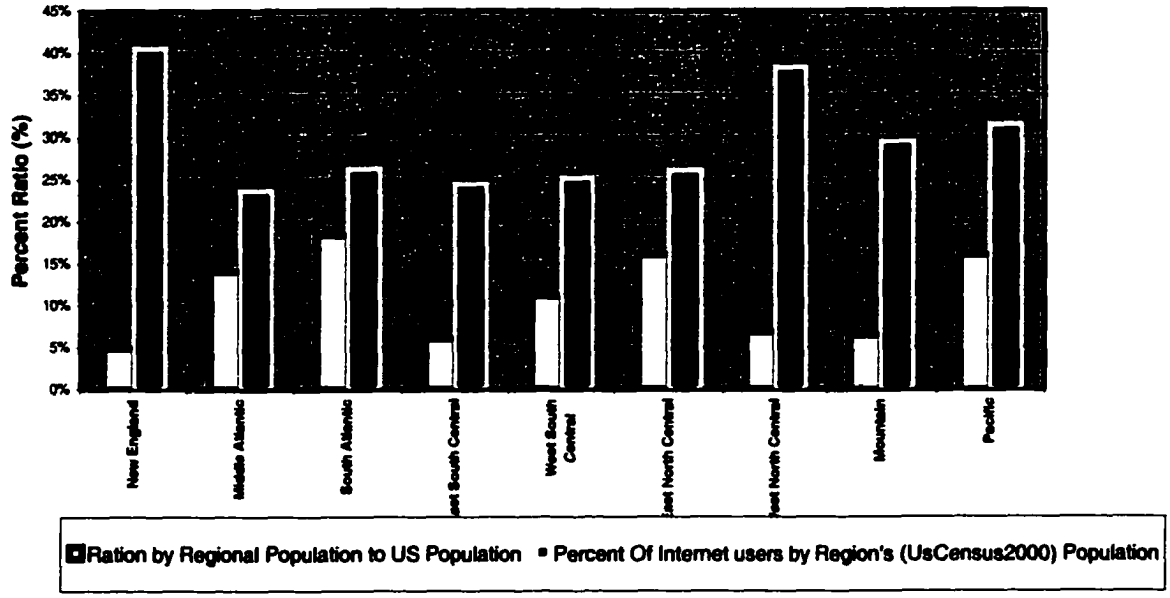


Figure V.14.US-Census2000,Population by Regions,Internet Users' by Regions as of December 2000

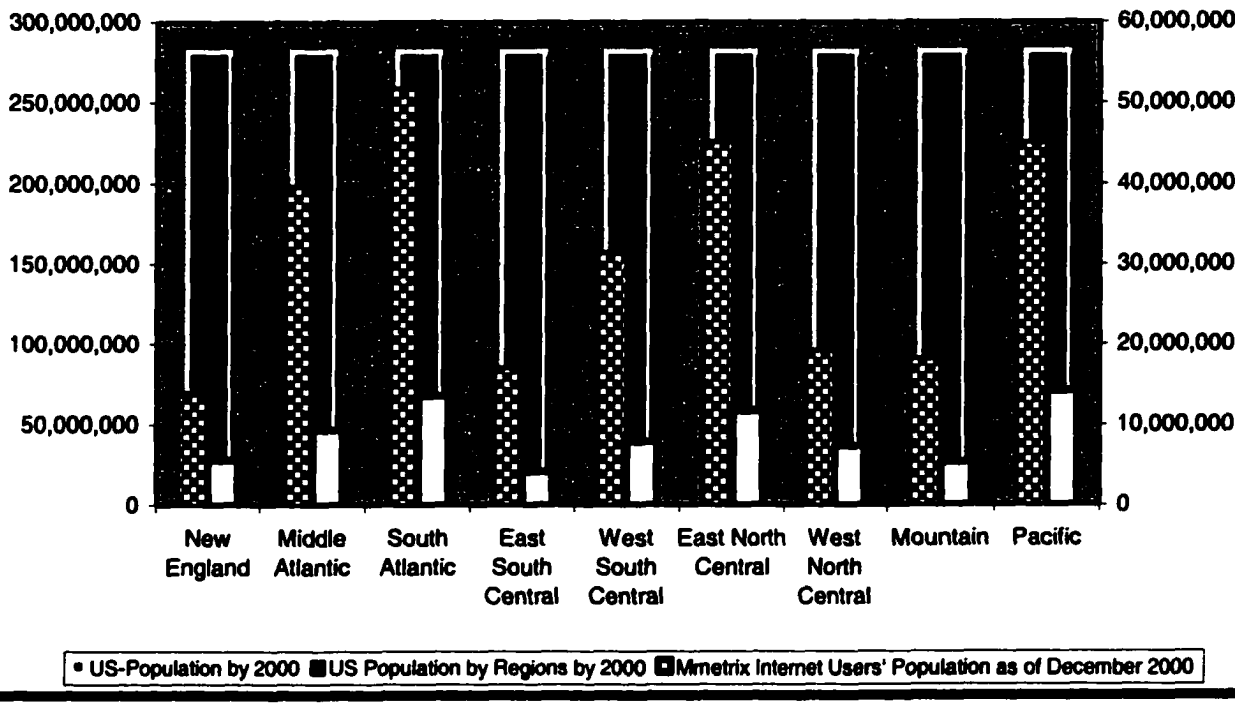


Table IV.1.Global Online Populations				
Worldwide Internet Population 445.9 million (eMarketer) 533 million (Computer Industry Almanac)			Projection for 2004: 709.1 million (eMarketer) 945 million (Computer Industry Almanac)	
Nation	**Population**	**Internet Users** (Source)	**Active Users** (Nielsen//NetRatings)	**ISPs**
Argentina	37.4 million	2.0 million (D'Alessio IROL)	1.9 million	33
Australia	19.4 million	5 million (eMarketer)	5.6 million	718
Austria	8.2 million	2.7 million (Austrian Internet Monitor)	1.3 million	37
Bahrain	645,361	<40,000 (DIT.net)	NA	1
Belarus	10.4 million	100,000 (Belarus Embassy)	NA	4
Belgium	10.3 million	2.7 million (InSites)	1.6 million	61
Brazil	174.5 million	6.1 million (eMarketer)	6.0 million	50
Bulgaria	7.7 million	585,000 (GFK-Bulgaria) 386,000 (BBSS	NA	26
Canada	31.6 million	14.2 million (Media Metrix Canada)	8.8 million	760
Chile	15.3 million	1.8 million (Int'l Telecom. Union)	NA	7
China	1.3 billion	33.7 million (CNNIC)	NA	3
Colombia	40.3 million	700,000 (IDC)	NA	18
Croatia	4.3 million	300,000 (IDC)	NA	9
Cuba	11.2 million	40,000 (Cuban Government) 60,000 (Int'l	NA	4
Czech Republic	10.2 million	2.2 million (GfK)	NA	>300
Denmark	5.4 million	1.6 million (NetValue)	1.6 million	13
Djibouti	460,700	<1,000 (Djibouti Dept. of Statistics)	NA	1
Egypt	70 million	455,000 (DIT.net)	NA	50
Estonia	1.4 million	462,000 (TNS Interactive)	NA	28
Finland	5.2 million	2.0 million (eMarketer) 2.15 million (Te	1.0 million	23
France	60 million	11 million (Nielsen//NetRatings)	5.5 million	62
Germany	83 million	26 million (Forsa)	15.1 million	123
Greece	10.6 million	1.3 million (VPRC)	NA	27
Hong Kong	7.2 million	3.9 million (Nielsen//NetRatings)	NA	17
Hungary	10.1 million	730,000 (NetSurvey)	NA	16
Iceland	278,000	167,000 (Int'l Telecom. Union)	NA	7
India	1 billion	5.0 million (NASSCOM)	NA	43
Ireland	4.0 million	1.0 million (Amarach)	560,000	22
Israel	6.0 million	1.2 million (eMarketer)	976,000	21
Italy	57.7 million	11.0 million (Nielsen//NetRatings)	8.3 million	93
Japan	126.8 million	22 million (eMarketer)	20 million	73
Jordan	5.2 million	25,000 to 30,000 (Human Rights Watch)	NA	5
Kuwait	2 million	63,000 (eMarketer)	NA	3
Lebanon	3.6 million	approx. 420,000 (Arab Advisors)	NA	22
Libya	5.2 million	7,500 (Internet Arab World)	NA	1
Lithuania	3.6 million	320,000 (SIC Gallup Media)	NA	14
Malaysia	22.2 million	2 million (IDC Malaysia)	NA	7
Mexico	101.8 million	2.3 million (eMarketer)	1.7 million	51
Morocco	30.6 million	50,000 (Internet Arab World)	NA	8
New Zealand	3.8 million	1.3 million (Nielsen//NetRatings)	1 million	36
Norway	4.5 million	2.2 million (Norsk Gallup)	1.4 million	13
The Netherlands	16 million	6.8 million (Nielsen//NetRatings)	4.5 million	52
Oman	2.6 million	50,000 (DIT.net)	NA	1
Philippines	82.8 million	2.0 million (DigitalFilipino.com)	NA	33
Portugal	10.1 million	3.055 million (ICP/Anacom)	NA	16
Qatar	769,000	47,000 (Internet Arab World)	NA	1
Romania	22.4 million	630,000 (European Survey of the Info. Soci	NA	38
Russia	145 million	7.5 million (Computer Industry Almanac)	NA	35
Saudi Arabia	22.8 million	300,000 (Internet Arab World)	NA	42
Singapore	4.3 million	1.3 million (Singapore IDA)	956,000	9
Slovakia	5.4 million	approx. 700,000 (TNS Factum)	NA	6
Slovenia	1.9 million	approx. 400,000 (RINE Project)	NA	11
South Africa	43.6 million	1.5 million (Nielsen//NetRatings)	611,000	44
South Korea	47.9 million	16.7 million (Gartner Dataquest)	13.1 million	11
Spain	40.0 million	7 million (Telefonica)	4 million	56
Sri Lanka	19.4 million	<50,000 (NUA)	NA	5
Sudan	36.0 million	10,000 (Internet Arab World)	NA	1
Sweden	8.9 million	4.5 million (Nielsen//NetRatings)	3.0 million	29
Switzerland	7.3 million	3.4 million (Nielsen//NetRatings)	1.8 million	44
Syria	16.7 million	20,000 (Internet Arab World)	NA	1
Taiwan	22.3 million	6.4 million (iamasia)	5.0 million	8
Thailand	61.8 million	4.6 million (Bangkok Poll Center)	NA	15
Tunisia	9.7 million	<120,000 (Internet Arab World)	NA	1
Turkey	66.5 million	3.7 million (IBS)	NA	22
UAE	2.4 million	920,000 (EIM)	NA	1
Ukraine	48.8 million	750,000 (Committee on Comm. and Info.)	NA	32
United Kingdom	59.6 million	33.0 million (Jupiter MMXI)	13.0 million	245
United States	278.0 million	149 million (Computer Industry Almanac)	102.0 million	7,800
Vietnam	80.0 million	22,000 (CommerceNet)	NA	5
Venezuela	24 million	1.2 million (Cavecom-e)	NA	16
Yemen	18.0 million	12,600 (Internet Arab World)	NA	1

* :Population data is provided by CIA Statistics
** : ISP statistics from CIA report
*** : Online users statistics from Nielsen Rating and Different sources

Table IV.2. Web Pages By Language		
Language	**Web Pages**	**Percent of Total**
English	214,250,996	68.39
Japanese	18,335,739	5.85
German	18,069,744	5.77
Chinese	12,113,803	3.87
French	9,262,663	2.96
Spanish	7,573,064	2.42
Russian	5,900,956	1.88
Italian	4,883,497	1.56
Portuguese	4,291,237	1.37
Korean	4,046,530	1.29
Dutch	3,161,844	1.01
Sweden	2,929,241	0.93
Danish	1,374,886	0.44
Norwegian	1,259,189	0.4
Finnish	1,198,956	0.38
Czech	991,075	0.32
Polish	848,672	0.27
Hungarian	498,625	0.16
Catalan	443,301	0.14
Turkish	430,996	0.14
Greek	287,980	0.09
Hebrew	198,030	0.06
Estonian	173,265	0.06
Romanian	141,587	0.05
Icelandic	136,788	0.04
Slovenian	134,454	0.04
Arabic	127,565	0.04
Lithuanian	82,829	0.03
Latvian	60,959	0.02
Bulgarian	51,336	0.02
Basque	36,321	0.01
Source: Vilaweb **Forester Research: www.Forester.com**		

Table IV.3.Features That Will Drive E-Commerce	
Feature	**Percent of Internet Purchasers**
Free product delivery	98%
On-time delivery guarantees	95%
No sales tax	91%
Coupons/promotions	83%
Toll-free customer assistance	68%
Live, online customer assistance	62%
Customers reviews or recommendations	62%
Helpful hints for colors, sizes, etc.	58%
Free gift wrapping	58%
Gift suggestions	46%
Source: Andersen Consulting	

Table IV.4.Average Internet Usage, Canada vs. US May 2000		
	Canada	**United States**
Number of sessions per month	20	18
Number of unique sites visited	18	10
Page views per month	726	662
Number of sessions per month	20	18
Page views per surfing session	37	36
Time spent per month	9:35:00	9:05:24
Time spent during surfing session	0:29:16	0:29:50
Duration of a page viewed	0:00:47	0:00:50
Average click rate for top banners	0.37	0.49
Active Internet universe (actually surfed)	8.1 million	82.7 million
Current universe estimate (had access, but did not go online)	13.1 million	134.2 million
Source: Nielsen//NetRatings		

Table IV.5.What Kids Do Online Age 8 to 12	
Play games	80%
E-Mail	72%
Chat/message boards	58%
Schoolwork	54%
Download music	42%
Shop/Buy Stuff	22%
Enter contests	18%
Source: Zandl Group	

Table IV.6.Reasons Teens Go Online	**Primary Reason**
Send/receive e-mail	44%
Research/get information	19%
Play games	10%
Use chat rooms	10%
Download music/videos	6%
Send electronic greeting card	0%
Shop	2%
Read news/sports/other	4%
Other	5%
Source: PricewaterhouseCoopers	

gional Web Page Category Preferences (Top Three Rank)

	New England			Middle Atlantic	
1			1		
earch	art	Computer	Search	Computer	art
,060.6	3,437.7	2,984.7	5,921.7	3,186.5	2,750.9
earch	ISP	art	Search	Computer	art
,669.4	2,731.6	2,611.2	4,659.2	2,751.3	2,202.4
siness	art	Auto	Business	art	Auto
,135.8	6,485.6	5,881.2	8,460.1	6,425.8	5,667.5
ravel	Search	art	Search	Travel	art
631.0	2,361.0	1,449.0	3,867.0	3,303.0	2,523.0
ravel	Search	Computer	Search	Travel	Computer
968.0	2,834.0	1,484.0	5,299.0	2,878.0	2,837.0
ravel	Search	Computer	Search	Computer	art
965.0	2,480.0	1,451.0	5,289.0	3,365.0	2,787.0
ravel	Search	Computer	Search	Computer	art
365.0	3,252.0	2,285.0	8,291.0	5,046.0	4,587.0
ravel	Search	art	Search	Computer	art
150.0	4,607.0	2,679.0	9,261.0	6,044.0	5,673.0
ravel	Search	art	Search	Computer	Business
459.0	3,399.0	1,686.0	7,410.0	4,042.0	3,933.0
ravel	Search	art	Search	Business	art
056.0	4,663.0	2,179.0	10,808.0	5,271.0	5,034.0
ravel	Search	art	Search	art	Business
270.0	4,757.0	2,762.0	11,509.0	6,096.0	5,535.0
ravel	Search	Business	Search	art	Travel
406.0	5,978.0	2,372.0	13,306.0	7,905.0	6,192.0
avel	Search	art	Search	art	Travel
036.0	5,090.0	3,354.0	10,568.0	7,701.0	5,883.0
avel	Search	art	Search	art	Travel
534.0	4,843.0	3,412.0	9,615.0	6,916.0	5,954.0
avel	Search	art	Search	art	Travel
232.0	4,920.0	3,588.0	11,138.0	7,569.0	6,133.0
avel	Search	art	Search	art	Business
064.0	4,083.0	3,844.0	8,645.0	7,625.0	6,378.0
avel	Search	art	Search	art	Computer
092.0	4,195.0	3,054.0	9,005.0	6,278.0	6,296.0
avel	Business	Computer	Computer	Business	Shopping
469.0	4,035.0	3,703.0	8,228.0	7,302.0	6,190.0
avel	Search	Computer	Computer	Search	Travel
518.0	4,276.0	3,667.0	8,198.0	7,935.0	7,437.0
avel	Business	art	Business	Computer	art
577.0	4,383.0	4,120.0	9,189.0	8,783.0	8,694.0
avel	Search	art	Computer	Search	art
975.0	3,814.0	3,484.0	8,540.0	8,290.0	8,050.0
avel	Search	Shopping	Search	art	Shopping
116.0	5,207.0	4,352.0	9,909.0	9,518.0	8,450.0
avel	Computer	art	Computer	art	Travel
80.0	4,334.0	3,875.0	8,694.0	7,689.0	4,428.0
avel	Computer	art	art	Computer	Search
49.0	7,532.0	4,651.0	13,625.0	9,347.0	6,691.0
avel	art	Business	art	Business	Computer
24.0	7,013.0	4,613.0	13,169.0	9,597.0	8,929.0
rt	Business	Computer	art	Business	Computer
57.0	4,416.0	3,380.0	12,829.0	8,647.0	6,465.0
rt	Travel	Business	art	Business	Computer
35.0	7,225.0	5,449.0	16,050.0	10,916.0	9,291.0
rt	Travel	Business	art	Business	Computer
04.0	6,357.0	5,151.0	13,688.0	10,253.0	9,660.0
rt	Travel	Business	art	Computer	Business
01.0	6,023.0	3,713.0	13,680.0	8,771.0	7,378.0

Table V.2.Montly ,The Highest Internet Visitors by Regions

57,790	13,382	12,669	16,241	15,498	15,962	28,976	6,550	5,437
60,677	12,606	14,402	16,906	16,758	17,156	29,259	7,372	5,732
62,516	12,753	14,282	18,196	17,248	18,034	29,153	7,709	5,763
56,761	3,583	7,251		2,132	5,461	10,413	3,440	9,433
56,761	3,643	7,162		1,841	5,537	10,743	3,656	9,748
58,383	3,391	7,625	8,970	2,942	5,942	5,521	3,965	10,606
59,985	3,433	7,314	9,299	3,087	6,338	5,737	4,080	11,084
61,568	3,490	7,587	9,716	3,130	6,386	6,034	4,123	11,286
61,128	3,651	7,407	9,496	3,186	6,527	6,061	4,019	11,101
61,891	3,535	7,340	9,633	3,318	6,518	5,935	4,136	11,850
62,655	3,780	7,816		3,382	6,830	6,228	4,146	11,169
62,895	3,747	7,897	10,172	3,027	6,221	5,970	3,780	11,485
63,135	3,866	8,040	10,083	3,101	6,358	6,047	3,861	11,461
63,375	3,812	7,679		3,123	6,652	5,901	3,739	11,715
63,862	3,890	7,908	10,545	2,952	6,252	5,709	3,707	11,852
64,612	4,270	7,956	10,378	3,031	6,530	5,882	3,796	11,793
65,069	4,073	8,128	10,411	3,295	6,949	5,930	3,686	11,876
68,325	4,352	8,084		4,800		6,106	7,046	4,022	13,191
70,359	4,443	8,455		3,575	7,587	10,021	6,153	4,543	13,884
72,652	4,443	8,959		3,404	7,962	10,512	6,230	4,935	14,357
74,796	4,607	9,554		3,697	7,539	10,898	6,291	5,378	15,321
75,724	5,411	9,798		3,537	7,650	10,543	6,830	5,379	15,079
76,359	5,392	9,895		3,785	7,582	10,645	6,712	5,201	14,851
76,911	5,157	9,514		3,977	7,534	10,993	6,665	5,126	14,983
77,020	5,355	9,208		3,831	7,566	11,444	7,000	5,402	14,704
77,439	5,448	9,530		3,813	7,471	11,302	6,883	5,280	14,820
78,534	5,241	9,820		4,012	7,634	11,334	6,874	5,539	15,030
78,761	5,279	9,519		3,756	7,709	12,087	7,194	5,611	14,400
79,239	5,635	9,374		4,162	7,898	11,753	7,351	5,359	14,139

6.5.Bibliography

Baily, M.N. and Lawrence, R.Z. (2001), "Do We Have a New E-conomy?" *American Economic Review Papers and Proceedings*, 91: 308-312. May.

Barro, R., and, Xavier,S.M. (1995), "Economic Growth," *McGrraw-Hill*, New York.

Basu,S., J.Fernald,and M.Shapiro. (2001),"Productivity Growth in The 1990s' Technology, Utilization, or adjustment?" *NBER.*

Bureau of Labor Statistics (1999), Online Service.

Christen son, M.C. (1997), "The Innovator's Dilemma: When New Technologies Cause Great Firms to Fail," *Harvard Business School Press. 1997.*

Council of Economic Advisors (2000*), Economic Report of the President,* www.access.gpo.gov/usbudget/fy2001/erp.html

Cracknell,D., Majumdar S., and Patel,N. (2000), "What Drives Internet Demand in The UK)," Online Document.

Department of Commerce, Bureau of Economic Analysis (1999), "Fixed Reproducible Tangible Wealth in the United States, 1925-94." *Washington, D.C: Government Printing Office.*

Dietmar, H., Henkel, J., and von Hippel, E. (2000), "Profiting from voluntary information spillovers: How users benefit by freely revealing their innovations" *MIT Sloan School of Management WP* # 4125.

Everett Rogers (1962,pp. 1-20), "The Diffusion of Innovation", New York.

Economic Report of the President, (1994), Washington, D.C*: Government Printing Office*

Gans, J. S., and Stern, S. (1999), "The Economics of User-Based Innovation," *MIT SSM Working Paper.*

Greenwood, J., Jovanovic,B. (1999), "The Information-Technology Revolution and the Stock Market" *at Rochester University.*

Gitlin, D.G. (2000), "Next Generation Networks, The New Public Network", *Columbia University, Working Papers.*

Gordon, J.R. (2000), " Does the 'New Economy' Measure up to the Great Inventions of the Past? "*Northwestern University; National Bureau of Economic Research (NBER), Center for Economic Policy Research (CEPR), NBER Working Paper No.* W7833.

Gordon, J.R. (1999), "Organizational Behavior: A diagnostic approach", *Prentice Hall International Inc.*

Gordon, L.R. (February 2002), "Technology and Economic Performance in the American Economy" *National Bureau of Economic Research (NBER);* Center for Economic Policy Research (CEPR)

Hall, R.E., (1990), Invariance Properties of Solow's Productivity Residual. Growth/Productivity/Unemployment: Essays to Celebrate Bob Solow's Birthday, Ed.P.A. *Diamond, Cambridge, MA: MIT Press.*

Herstatt, C., and von Hippel, E. (1992), "From Experience: Developing New Product Concepts Via the Lead User Method: A Case Study in a "Low Tech" Field", *Journal of Product Innovation Management*, 1992; 9: 213-221.

Hand, John R.M. (2000), "The Role of Economic Fundamentals, Web Traffic, and Supply and Demand in the Pricing of U.S. Internet Stocks", *EFA* 0320.

Howe, Walt. 2000, "A Brief History of the Internet." (April 18). http://www0.delphi.com/navnet/faq/history.html

IMF (1999a), "*World Economic* Outlook, May 1999," Washington.D.C.

Internet Capital Group. 2001. www.icg.com.

Kenney, M., and Curry, J. (2000), "Beyond Transaction Costs: E-commerce and the Power of the Internet Data space." *Worlds of E-Commerce: Economic, Geographical and Social Dimensions (*New York: John Wiley & Sons): 45-66.

Kenney,M.(2001)," The Growth and Development of the Internet in the United States" *BRIE Working Paper* 145

Learner,E, and Storper,M. (2001),"The Economic Geography of Internet Age," *NBER Working Paper.*

Madden and Savage (1998), "Pricing and Internet traffic. Paper presented to 1998" *International Telecommunication Society conference, Stockholm.*

Nordhaus, W.D., (2000), "Productivity and the New Economy." *Cowles Foundation Discussion Paper* No. 1284. New Haven, CT: Yale University.

Oliner, S.D., and Sichel, D.E., (2000), "The Resurgence of Growth in the Late 1990s: Is Information Technology the Story?" *Journal of Economic Perspectives*, 14: 3-22.

Postel,J., and Roberts,G.L., and Wolff,S. (2000), "A Brief History of the Internet." http://www.isoc.org/internet-history/brief.html#Initial_Concepts

Robertson, T.S. (1971), "Innovative Behavior and Communication, New York.

Rappoport,K., and Taylor (1998), "An Econometric Study of the Demand for Access to the Internet. At 1998" *International Telecommunications Society conference, Stockholl.*

Romer, .P (1996), "Why, Indeed in America? Theory, History, and the Origins of Modern Economic Growth", *NBER Working Paper,* #5443.

Sonnack, M.(2000), "Creating Your Next Breakthrough, Lead-User Research at 3M, a new approach to anticipate customer needs", *Division Scientist, Corporate Marketing 3M Company.*

Solow, R.M., (1957),"Technological Change and the Aggregate Production Function." *Review of Economics and Statistics*, 39: 312-320.

US Department of Commerce (1999a), Emerging Digital Economy.

US Department of Commerce (2002), "A Nation Online", *National Telecommunication and Information Administration.*

US Government Working Group on Electronic Commerce (1998), "First Annual Report the Center for Communication Policy at University California at Los Angeles. The latest survey results were published in November 2001".

US Government Census (2000), Online data service.

VerticalNet. (2001), www.verticalnet.com.

Wenger, Etiene (1998)," Communities of Practice: Learning, Meaning and Identity" (New York).

Zysman,J., and Weber,S. (August, 2001), "Governance and Politics of the Internet Economy: Historical Transformation or Ordinary Politics with a New Vocabulary? "BRIE Working Paper 141" *Berkeley Roundtable on the International Economy (BRIE)*, University of California, Berkeley.

Essay 2

Rendering of The Leading Edge Internet Users By an Econometric Study

Chapter VII

7. Introduction

7.1. Leading Edge Users

Lead users are users whose present strong needs will become general in a marketplace months or years in the future. Since lead users are familiar with conditions, which lie in the future for most others, they can serve as a need-forecasting laboratory for market research. Moreover, since lead users often attempt to fill the need they experience, they can provide new product concept and design data as well. How lead users can be systematically identified, and how their perceptions and preferences incorporated into industrial and consumer marketing research analyses of emerging needs for new products, processes and services is examined in Chapter 9 by summarizing major article in this field.

It is very important to answer the question why to disclose leading edge users is needed. For marketing purposes, such as determining right audiences for right products, leading edge users must be found out to address the target group correctly. Having figuring out the targeted leading edge users, one can predict future trends in the market for the specific product. By monitoring leading edge group, next generation customer needs can be fulfilled, which in turn will save time, cost and human efforts. Even though the research on leading edge users has found many interests in academic arena, there has not yet been successful and substantial outcome. The main reasons behind these unsuccessful attempts are that a widely accepted theoretical background has not been laid out, and it requires dedicated team work over long time periods with detailed, large size

database. For these reasons, it has been difficult to encounter academically sound study cases. In this study, we have focused on determining the lead edge users for US Internet users by running the regression more than 5000 times and minimized sum of square error and maximized R-square to bring together relatively close attributes.

When we determine leading group, it will give us information regarding market future trend and Internet user's preferences. Using that information marketing for product will be more profitable and developing new good base on future needs of customer has low cost for company.

In this study, to determine the Leading edge users we used two major Econometric methods first one is Single Variable Estimation and second one is LAG (1) operation. Sample size is covering 29 months and we run more than 5000 regression equations to find similar attributes. Firstly minimized sum of square error and then maximized the R-square. Attempt to find the best group of attributes characteristics and those attributes shows similarity with whole number of Internet users. We did not attempt to look at exact person who is represent our leading group, we only concerned to find that leading group general character (age level, income level, household size, region)

7.2. At the Leading Edge of the Leading Edge

After 1990 the biggest and unexpected growth of the Internet obliged to both High-Performance Computing (HPC) development and wide is network service development. From IDC corporation analyst C.Willard and N.Kaufman (2000) research point out that Users of technical high-performance computing (HPC) have historically played a leading role in advancing the state of computer science. The list of innovations that were initially developed

either by or for technical computer users includes the Internet, Web browser technology, parallel computing, reduced instruction set computer (RISC) architectural concepts, distributed computing, and hierarchical storage management systems. A majority of the innovations that arise from the broader HPC market can be attributed to the scientific research community; this subset of the market includes educational institutions, national laboratories, privately funded research institutions, and research and large industrial development centers. These organizations have several characteristics that position them at the leading edge of technology development. Professor R. Gitlin (2000) last study shows importance of Network system and future estimate. This next-generation network, Public Switched Telecommunications Network (PSTN), will be a multi-service, high performance network, will support rapid service creation, and will provide a quality of service that is matched to the applications it carries. Extraordinary rates of progress in semiconductor, photonic, and software technologies have fueled an unparalleled level of expectations about this converged Voice and data, wireline and wireless "network of networks." Last century, almost 100 years it took to install the world's first 700 million phone lines; next 15-20 years an additional 700 million lines will be deployed. And also we will meet big change in the world next 15-20 years. For example, currently 250 million wireless subscribers in the world, next 15-20 years 700 million more subscribers will be added. Cable TV subscribers will be changed within 15-20 years from 200 million to 300 million. Base on 2001 data, The Internet users experiencing a 1000% per year growth, if this trend continues, by 2004 more than 95% of the world's bandwidth will be Net traffic.

That estimate shows there are still huge demand on the market, and also big competition. On the demand side some consumer has leading characteristics to created new product demand and they always capture this new product before than most of the people. Among the

competitors some of them always will be Leading Edge Company and have a big competitive advantage because of working with leading consumer group or predicting the best way future markets needs. On the below we summarized a cup of great work effort to figure out who has leading characters and advantage of the working with leading edge group.

7.3. Together, Leading Edge Company 3M and Leading Edge University MIT

Started working with Eric von Hippel at MIT in 1995, taking a year to develop a lead-user process for all 3M divisions. After 5 years they looked back to see what they got. The only way to know Lead User Method whether a method is really effective is to do a comparison study similar to those done to test the effectiveness of new medicines. Recently, 3M got to the point of having enough data on a big enough samples of innovation projects to enable academics to do such a study. This study compared the outcomes of the Lead User method as compared to idea generation methods traditionally used by 3M. 3M is known for its innovation capabilities - and study group find that the lead user process improves upon those capabilities. That results show that annual sales of lead user product ideas generated for the average lead user project at 3M are conservatively projected to be $146 million after 5 years - more than eight times higher than sales for the average contemporaneously-conducted "traditional" project. Each funded lead user project created a major product line for a 3M division. As a direct result, divisions funding lead user project ideas experienced their highest rate of major product line generation in the past 50 years. After that successful results and experience a number of major firms also interested for lead Users project and they also completed very successfully. Some name of the company is listed here, Verizon, Nortel Networks, Phillips, Pitney-Bowes, Nestle and Kellogg.

Chapter VIII

8. Literature Review

8.1. Theoretical Background:

8.1.1. Innovative Theory

The concept of use Internet may be explained by Innovative theory that is associated with users' choice of a new medium. There are many academic study suggested innovators frequently differ from later adopters in terms of their demographics (Luthje, 2000), (Robertson, 1971). Innovation means a renewal of elements in production organizations. Everett Rogers (1962,pp. 1-20) has defined the concept in one the classics of innovation theory. Rogers sees innovation as a process, which starts with the invention of a new element. The invention leads to the idea of practical development of the element for commercial use. Persons, groups or institutions implement this process, which is usually associated with a struggle to get the new element recognized by surrounding world and to develop it for commercial use. It must be both practically useful and economical. After this a single company or every few companies begin to introduce the new element, and gradually others begin to imitate these first companies and introduce the new element. In time more join in and there is a general social diffusion process in accordance with the "S-curve". That invention captured firstly leading group users for any sectors and they response help to improved new invention product later on get to know by most people. Innovation process might be short depends on Leading group experience and success. Inventions take on no economic significance if they are not introducing as commercial element.

Innovation is also defined in Schumpeter's (1943, p.66) original terms, innovation as one or more of the following events:

i) Introduce of a new product or a new product quality. ii) Introduction of a new production method iii) The opening up of a new market iv) The opening up of a new sources for raw material whether the source has existed before. v) The creation of a new organizational structure in industry.

Schumpeter's definition is that innovation is an effort made by one or more people, which produce an economic gain either by reducing cost or creating extra income. A qualitative change is necessary before it can be called innovation. Innovation can be following types:

i) A new product or a new service ii) A new production process iii) A new organizational or management structure iv) A new type of marketing or overall behavior on the market.

The Innovation can also have different characters:

i) Technological ii) Intellectual iii) Physical movement, new transport (but without a change in technology). iv) Behavior new strategy for the company's market behavior or a new organizational structure.

Russian economist Kondratiev (1935) stated that the capitalist economy moves in certain long cycles, which are regular. These cycles come regularly because they are caused by certain permanent evolutionary factors, which must necessarily cause a boom after a recession. There are two big discussion questions: Is there really regular cycles in the economy and in the second discussion question was whether the waves are borne up by particular causal factors, by means of which the cycles can be explained rather than only described as historically random variation. Later on come up two more discussion question which indicators can best be used to describe the waves and length of the waves.

Innovation is essential cause of the Kondratiev cycles but there are some other cause exists. These innovations provide the economy with a dynamic and give it a boost. However, the dynamic abates and the growth declines

Table VIII.1.Kondratiev Business Cycle and by Innovation Factors

	First Kondratiev 1770-1836	Second Kondrative 1836-1883	Third Kondrative 1883-1937	Fourth Kondrative 1937-1983	Fifth Kondrative 1983-?
Recovery	1770-1782	1836-1845	1883-1892	1937-1948	1983-1994
Prosperity	1782-1802	1845-1866	1892-1913	1948-1966	1994-?
Recession	1815-1825	1866-1873	1920-1929	1966-1973	
Depression	1825-1836	1873-1883	1929-1937	1973-1983	

Innovation is very important factor when the waves reach prosperity. Our century latest prosperity lived 1995-2000; it's a time of Information age. People of that time period easily reach information and share idea to create more innovative product and bring new competition, quality and good life quality. Some of the leading group always discovers something much early than rest of the people and be ahead of us. Those people carry big mission for technological innovation to bring good thing our life.

8.1.2. Industrial Innovations by Lead Users

Von Hippel found that users are often the developers of industrial products and equipment processes that become commercially successful (1988). Two of his studies showed an especially high proportion of user developed products. In one of them, he focused on four important instruments used by scientists and others to collect and analyze data. In the second, his focus was on two classes of process equipment used in the electronics industry. His research findings showed that users were the developer's seventy-seven percent scientific instrument innovations studied, and the developers of sixty-seven percent of the process machinery innovations studied. Studies done by numerous other researchers have found users to be the developers of many or the majority of commercially successful industrial innovations in a range of fields. Some of the major user-innovations that have been discovered by authors

of these studies are summarized in the Table 8.2. Notice that the user-innovations listed are in both low and high technology fields - and in many of these fields, users were responsible for developing over half of the products that eventually became commercially successful.

Table VIII.2.Summary of Data from Studies on the Role of Users in Product Development Innovation Product developed by:

Study Author	Nature of Innovations	N	User Mfg.	Other
Knigh, Computer innovations,1944-62	Systems reaching new performance high	143	25%	75%
	-Systems with radical structural innovations.	18	33%	67%
Enos Freeman	-Major petroleum processing innovations.	7	14%	43%
	Chemical processes and process equipment available for license, 1967.	810	70%	0%
Lionetta	All pultrusion processing machinery innovations first introduced commercially, 1940 - 1976 which offered users a major increment in functional utility	13	85%	15%
von Hippel	Scientific instrument innovations - first of type	4	100%	0%
	Major functional improvements	44	82%	18%
	Minor functional improvements	63	70%	70%
von Hippel	Semiconductor and electronic assembly manufacturing equipment:			
	- First of type used in commercial production	7	100%	0%
	Major functional improvements	22	63%	21%
	Minor functional improvements	20	59%	29%
VanderWerf	Wire stripping and connector attachment equipment	20	11%	33%

Sources: *Mary Sonnack Von Hippel,* Performance Assessment of the Lead User Idea Generation Process for New Product development MIT Sloan School of Management Working Paper # 4151 January, 2001

b) Personality

Behavior studies focused on factors influencing the decision-making process. Personality traits have been suggested to be one of the more, important factors that influence consumer behavior for decision-making. Some studies have used personality

type variables in searching for an individual's consumption Moorman, Miner (1997), Horney, (1958). Psychological research has identified key dimensions of attributes that compose a person's personality Gordon, (1999). Attribution theory is as central to personality psychology as it is to social psychology. Attributions as determinants of trait inferences, individual differences in causal ascriptions, self-esteem main-tenance, attributional determinants of expectancy of success and behavior change. Creativity is highly desirable quality for any person. Leading character, innovative personality and creativity is the highest feature of any industry group in present time. Those attributes bring competition for our market and it makes better life quality. The work of Sterberg and Lubart (1991) bring creativity to economic term under the name of "investment theory of creativity". Economic interpretations tend to view the creative individual as someone who invests in "human capital" pertaining to a particular enterprise secondly take exceptional risk to achieve exceptional goals and last one possess the personal resources, including the optimal character, to make the risky investments pay off. Personality is invoked to explain and to predict behavior by measuring personality attributes. Rotter (1966) proposed a measure of personality by examining the degree of external and internal locus of control. Internalisers are those who feel that they control their own lives and actions, whereas externalisers believe others control their lives. Thus, this school of thought is incorporated into the research design in order to explain the personality attributes of Internet users.

8.1.4.The theoretical model for 3M Lead User Project

End of the 3M project both side have huge benefit, 3M Company find a new product development method for academic area maybe first time theoretical method come out for lead users and innovation process. We are here summarizing that theoretical model.

There may be one or very few innovative users in a population of firms or individuals. Innovation is depending on the degree of rivalry – give innovative users a competitive advantage in their respective industry. The classical prediction concerning these users is that they will keep their innovations secret or use other methods of appropriation by which they can assure themselves of a high share of the total surplus generated by the innovation. But the empirical evidence developed above shows that this expectation is at least sometimes not met. Defying the conventional wisdom, innovative users may decide to openly reveal their innovation to all users and manufacturers.

Rival users are then in a position to reproduce the innovation in-house and benefit from using it and manufacturers are in a position to refine the innovation and sell it to all users, including competitors of the user revealing its innovation. Von Hippel study group never try to model explicitly how the heterogeneity among product users emerges, i.e., why some of them are endowed with innovations in that model and others are not. They purposes was that, it doesn't matter whether innovative users have reached their position by chance or, for example, by a special ability to engage in marketing research that enables them to generate particularly precise predictions about the nature and extent of future demand.

There are two users, first user having developed an innovation and user second not having done so. User 1's gain and also has a competitive effect for user 2. The strength of competition showed by α and specify the impact of the innovation on the other user's profit as – $\alpha\delta$ where $0<\alpha<1$. As we know in a fully developed oligopoly model, α, would be a function of technical and economic determinants. Note that a more dramatic improvement of the innovator's position is likely to hurt its competitors more than a marginal improvement would. The innovative user 1 may decide to reveal the innovation to a manufacturer of the

improved good. Revealing may have the advantage that the manufacturer can produce the product at lower cost than the innovator itself, or that it may have specific expertise in improving the product further, which the innovator may lack. In this case, Von Hippel assume that after revealing the innovation, the direct effect of the improved or less costly innovation on the user's profit is given by $\Delta=(1+\mu)\delta$ with $\mu>0$. The second user firm will also profit from the innovation, but to a lesser extent than the innovator. This effect is due to the fact that the innovator will have tailored the innovation optimally to its own production environment. Hence, the other user will only enjoy a marginal direct payoff of $\gamma\Delta$ with $\gamma=<1$. The case of $\gamma=1$ denotes one of complete Generality of the innovation, while $\gamma=0$ denotes the polar case of complete specificity. The impact of competition enters the payoffs again by subtraction of the other user's payoff times the competition parameter α hence, once the innovator has revealed the innovation, and once his competitor has adopted it, the innovator's payoff is given by $\Delta-\alpha\gamma\Delta$. While the other firm enjoys a payoff of $\gamma\Delta-\alpha\Delta$. Given that one user has developed an innovation and the other has not, what would be the outcomes of the revelation and adoption decisions? First of all note that adoption by user 2 will not always occur. Comparing payoffs (conditional on revelation by user 1) main finding is that for adoption to occur we have to have; $\gamma\Delta-\alpha\Delta>-\delta$

Notation:

δ- Payoff to innovator without adoption by competitor

Δ- Payoff to innovator with revelation and adoption by competitor,$\Delta=(1+\mu)\delta$

α- Degree of competition ($0<\alpha<1$)

γ- Generality/transferability of innovation ($0<\gamma<1$)

γM - Level of generality chosen by manufacturer ($\gamma<\gamma M<1$)

Intuitively, if generality is too low, the adopting user 2 would not gain much in direct payoffs from the adopted technology, but the competitive impact of user 1 enjoying a large improvement in its competitive position would create a large indirect negative effect. Thus, γ has to be sufficiently large and α and μ have to be sufficiently small to let user 2 adopt the technology. Thus, the combined condition for observing revelation of the innovation by user 1 and adoption by user 2 is given by $\alpha\mu/(1+\mu)<\gamma<(1/\alpha)\mu/(1+\mu)$.

An interesting situation arises if both user firms have developed an innovation.

In this study assume that symmetry with respect to the size of the innovation, hence each user would profit by δ if the information were not revealed. The duopoly payoffs are then given by $\delta-\alpha\delta$. Of particular interest are the cases in the lower right-hand corner of the sub-matrix. If, both users innovate, one of them reveals the innovation, and the second user chooses to adopt the other user's innovation once it has been improved by the manufacturer, the innovator's payoff is $\Delta-\alpha\gamma\Delta$while the adopter enjoys a payoff of $\gamma\Delta-\alpha\Delta$. The own innovation by user 2 does not express additional benefits. If both users innovate and reveal, the manufacturer has to choose one version of the innovation to be implemented in his improved products.

Competition, both users are endowed with an innovation, may lead to secrecy if the innovations are sufficiently specific or if the manufacturer's contribution μ is sufficiently small. If the innovations are sufficiently general and if the manufacturer can provide valuable improvements, firms will profit from coordinating their behavior.

8.2. Historical Review of Leading Edge User

8.2.1. Lead-User Research at 3M

Professor Eric von Hippel developed the "Lead User" basic process at MIT. The process was then greatly refined and made practical for routine industrial use by collaboration among von Hippel and Dr. Joan Churchill of LUCI, and Mary Sonnack, then a Division Scientist at 3M Corporation. Professor von Hippel (2000) discloses very simple way how to work Lead User process. That process brings client project teams systematically and quickly to the "bleeding edge" of technologies, market application areas or strategy arenas of client interest. It then helps teams to work directly with Lead Users in those fields - users that are typically not customers of your firm - to bring back information on radically new needs and radically new prototype solutions that Lead Users have developed. A Lead User project typically requires 15 hours per week from 4-5 very experienced and capable client employees for a period of 4 to 6 months. Lead User projects are therefore most appropriate for product or service or strategy development projects that are of major importance to the client.

8.2.2.How does the Lead User process differ from traditional idea generation processes?

Traditional idea generation techniques based on customer input usually collect information on new product needs from a random or typical set of customers. The "lead user process" takes a different approach. It collects information about both needs and solutions from users at the leading edges of the target market, as well as from users in other markets that face similar problems in a more extreme form. All processes designed to generate new ideas for products begin with information collected from users. What separates companies is the kind of information they collect and who they collect it from. Teams are usually taught to

collect information from users at the center of their target market. They try to learn what people at the center need by conducting focus groups and analyzing sales data, reports from the field, customer complaints and requests, and so on. Then they rely on their own creative powers to brainstorm their way to new ideas. Teams following this approach assume that it is the role of users to provide information about what they need and the job of in-house developers to use that information to create new product ideas. The lead user process takes a fundamentally different approach. It is designed to collect information about both needs and solutions from the leading edges of the target market and from markets that face similar problems in a more extreme form. Teams using this approach assume that lead users outside the company have already generated innovations and that their job is to track down especially promising lead users and adapt their ideas to the business's needs. Lead users with breakthroughs of commercial value are rare. To find them quickly and efficiently, Lead User Concepts has developed a telephone interviewing technique that enables project teams to network their way into contact with experts on the leading edge of the target market. Networking is effective because people with a serious interest in any topic tend to know of others who know even more than they do. Team members begin by briefly explaining their problem to individuals they believe to have some expertise - for example, authors who have written about the topic. Then, they ask for a referral to someone who has even more relevant knowledge. It's usually not long before a team reaches lead users at the front of the target market. The next step is to continue networking until lead users are found in "advanced analog" markets and fields that face similar problems but in different and often more extreme forms. Those people can help teams discover truly novel, "out-of-the-box" solutions to needs in the target market.

The only way to know Lead User Method whether a method is really effective is to do a comparison study similar to those done to test the effectiveness of new medicines. Recently, 3M got to the point of having enough data on a big enough samples of innovation projects to enable academics to do such a study. This study compared the outcomes of the Lead User method as compared to idea generation methods traditionally used by 3M. In order to insure objectivity, the senior author of the study was a well-known academic with no previous connection to the Lead User method. Eric Von Hippel, Mary Sonnack (2001) they were summarizes what was found: "3M is known for its innovation capabilities - and we find that the lead user process improves upon those capabilities. Our results show that annual sales of lead user product ideas generated for the average lead user project at 3M are conservatively projected to be $146 million after 5 years - more than eight times higher than sales for the average contemporaneously-conducted "traditional" project. Each funded lead user project created a major product line for a 3M division. As a direct result, divisions funding lead user project ideas experienced their highest rate of major product line generation in the past 50 years." Funded ideas from a total of only 5 LU idea generation projects are conservatively projected to yield $730m in incremental annual sales for 3M.

In this study they developed two data collection instruments, outcome survey and process survey. Base on previous experience they prepare a New Product Idea Description Form. For Process Survey method, they developed new methodology to measure individual skills in idea generation activities, individual characteristics such as job level, personality traits. Using web-based version of Myers-Brigg's Personality Inventory they developed items for the individual skills identified in the literature to be associated with generating new product ideas and from interviews with lead user team leaders and their primary LU trainer.

Collection data process takes a long time of period first thing they did face-to-face interview meetings with each LU project team leader for all funded projects. During these interview meetings they asked each project leader to: (a) identify and recruit the members of their team as respondents; (b) identify and recruit appropriate respondents within the same division to provide non LU idea method data; and (c) describe the New Product Development goals and outputs from the LU project, provide organizational information about their division, and provide process information. After the meetings with team leaders, that research group contacted the respondents identified in (a) and (b) above. The respondents from non-LU idea generation methods provided detailed information both on funded ideas as well as on process data. Respondents returned all (100%) of the Idea Description Forms for LU projects and 79% for non-LU projects, and 94% of the Process Measure Forms for LU 14 projects and 86% for non-LU projects. These response rates are sufficiently high to suggest that validity checks for non-response bias are not needed. Also they did one more thing to collected data on major new product ideas developed early in the 1950-2000 period through in-depth interviews conducted with long-tenure employees in each of the LU study-divisions who had a good knowledge of their division's and product line histories. They converted all historical dollar figures to 1999-dollar equivalents using U.S. consumer price index data Main result was that the average "sales in year 5" for LU major product lines (n=5), is $146m, while the similar figure for major product lines generated by non LU methods (n=16, as they were only able to obtain detailed data on only 16 of the 21 non LU major product lines) is $62m. Using that information test whether the mean LU major product line yields higher sales than those derived from non-LU sources. At the p = .05 level they reject the hypothesis that these values are equivalent

Here is the major hypothesis during that Lead User Project.

H1: Lead user methods will generate ideas with greater commercial potential than will Non-LU methods
H2: Lead user methods will increase the overall rate at which the organization generates major new product lines
H3: LU methods will cost more in money and time than Non-LU methods to generate ideas forming the basis for funded projects

Profiles of the 5 LU major product lines and the 16 non-LU major product lines for which they were able to collect data, they find that the ideas for major new product lines developed by LU and non-LU methods are relatively similar on most dimensions examined. To test the hypothesis that the LU method produce major new product line ideas at a higher *rate* than do non LU methods (H2), look at the entire 4-year period during which the LU process was implemented at 3M and compare it with all other four-year periods during 1950-2000. The average rate of major product line development during this half-century for the divisions study was 1.64 per 4-year period. Rejected the hypothesis (H3) regarding a significant difference between LU and non-LU major product lines on this matter.

There were 6 lead-user projects; one of the project names was the medical products project, they started 1995 and completed first time that project in 1997. We could try to summarize here briefly that project process step by step from Mary Sonnack work (2000). First thing, expert person and lead-user interviews such as developer new surgical technique for preventing skin contamination. Figuring out emerging trends and future health care needs. Contact with users who needs extremely for portable, flexible and inexpensive products. 3M division visits in Asia and Latin America. Also they visit in over their hospital, operation rooms, centers in microbiology and centers in infection prevention. Purpose of that visit to observe product and service needs in "high risk" regions of the word and learn from leading

practitioners how to provide products and service to "cost-conscious" countries. Then start screening workshop participants. Someone is expertise relevant top different aspect of task, Innovative and leading edge solution ideas to offer. Candidate who has strong personal interest in finding innovative solutions and willing to sign over "ownership ideas" to company. During the workshop main goal was concepts for an economical system of products to reduce patient infection during surgery. It's a special process to work with users with extreme needs. They keep included target market experts to keep the sessions focused on the objective- in this case low cost surgical drapes. 11 lead users and leading experts plus project team and other company personnel attended. First those people get together in small groups to create some solution. After show solution come out from different small group, everyone get together to discuss and evaluate one more times those solution to see improvement. Get idea from expertise person regarding for new product, it should be easy to use on skin, safe on varied skin types and works on body contours. Low-cost infection prevention, minimum of materials needed, effective under high-risk conditions. In that small group team worked sometimes 4 to 6 months with marketing people who knows what markets needs and technical people who know the technologies and cost. During that time they only focus on gathering needs and solution information from leading edge users. It's a really interactive data gathering methods. Rich information on emerging and future need. Higher quality and often breakthrough concepts. Product and service development process takes 1-2 years to 3-6 months end of project the biggest challenges is efficiently finding the "right" lead users.

3M Company's scientist Mary Sonnack summarized LU project (2000). She said outcomes from 6 lead-user projects and traditional outcome of 6 same projects, in 3M Divisions. In past have generated 1 major new product line every 6 years on average. Major

outcomes of lead user studies, in 4 of 6 studies, new "breakthrough" strategies and related product line concepts were generated that are being actively developed by 3M Divisions management. Business analyses to date project $1.2 billion in new sales (total for the 4 Divisions) from the Lead User-generated concepts in 5 years at significantly higher margins than current Divisions averages. Lead User-Project expected outcomes almost equal total 1999 sales of those 4 Divisions- $1.4 billion. End of 3M project, one result come out and to classify the Lead Users under three categories. It is useful to think about three different categories of lead users that can provide important information to lead user project teams. During a lead user study, team members systematically contact each type in order to get the best possible information for their project. The three types of lead users are:

1) Lead users in the *target* application and market,
2) Lead users of similar applications in advanced *"analog"* markets,
3) Lead users with respect to important *attributes* of problems faced by users in the target market. To illustrate these three types of lead users: Suppose that a manufacturer of medical X-ray systems decides to form a lead user project team to identify concepts for new products in that field. The team researches the target market and finds two important trends. One trend is towards images with higher resolution; another was towards better methods for recognizing subtle patterns in images that are medically important – for example, patterns that indicate possible early-stage tumors. In this example, the team might go on to identify and learn from the three

8.2.3. More Leading Edge User Study on the Literature

The most important function of marketing research is to precisely understand user needs for potential new products. The success of new products in the market depends on essential

input to the new product development process. In some fields, users have been shown to be the actual developers of most of the successful new products eventually commercialized by manufacturers. For example, users were found to be the actual developers of 82% of all commercialized scientific instruments studied and 63% of all semiconductor and electronic subassembly manufacturing equipment innovations studied. (Eric von Hippel, 1976) There are some methods to identify leading users which are Similarity-dissimilarity ranking method and focus group methods. In similarity-dissimilarity ranking, inviting a sample of consumers to compare products in that category and assess their similarity and dissimilarity generates data regarding the perceptual dimensions by which consumers characterize a product category. The consumer simply provides similarity and difference rankings, and the market analyst determines, the important perceptual dimensions that "must" be motivating the consumer rankings obtained. The method clearly depends heavily on an analyst's qualitative ability to interpret the data and correctly identify all the critical dimensions.

In focus group methods, market analysts bring together a group of consumers familiar with a product category for a qualitative discussion of perhaps two hours' duration. Analyst sets the topic and discussion is recorded, transcribed, and later reviewed by the analyst whose task it is to identify the important product attributes, which have implicitly or explicitly surfaced during the conversation.

Von Hippel (1986) has proposed that analysis of need and solution data from" lead users" can improve the productivity of new product development in fields characterized by rapid change. Lead users are users whose present strong needs will become general in a marketplace months or years in the future. Since lead users are familiar with conditions, which lie in the future for most others, von Hippel hypothesizes that they can serve as a need-

forecasting laboratory for marketing research. Moreover, since lead users often attempt to fill the need they experience, in the hypothesize that they can provide valuable new product concept and design data to inquiring manufacturers in addition to need data. In this article von Hippel picked computer-aided design (CAD) system for case study. Because it is a large, growing and rapidly changing market. This market grew at over 35 percent per-year. They specifically examine the CAD systems used to design the printed circuit chips PC-CAD and other electronic products. First step in investigating lead user data in PC-CAD was to identify an "important" trend in that field. They identified experts by telephoning interview with companies. In order to identify lead users of PC-CAD systems capable of designing high density printed circuit boards he had to find that subsets of users who were designing very high density board density and gain high benefit from increases in board density. 136 persons answered the question. High proportion of user-innovators, which he found in sample, is probably representative of the general population of PC-CAD users. Sample size was well dispersed across the self-stated scale with respect to innovativeness (24 percent indicated they were on the leading edge of technology, 38 percent up to date, 25 percent in the mainstream, and 13 percent adopting only after the technology is clearly established). Von Hippel conducted a cluster analysis of broadcast questionnaire data relating to the hypothesized lead user characteristics in an attempt to identify a lead user group. In the two-cluster solution, the lead user cluster is clearly distinct from cluster on all attributes measured. Many more respondents in the lead user group report building their own PC-CAD system judge himself or herself to be more innovative (3.3 versus 2.4 on the four-point scale with higher values more innovative), are earlier adopters, and are more dissatisfied with commercially available systems (4.1 versus 5.3 with higher values indicating satisfaction). Twenty eight percent of our respondents are classified in this lead user cluster. The two clusters explained 24 percent of

the variation in the data. Given the robustness of the lead user profile across both clustering, Von Hippel selected the two-cluster solution as the more economical basis for further analysis. A discriminate analysis on lead group membership indicated that "build own system" was the most important indicator of the lead user cluster. The discriminate analysis had 95.6 percent correct classification of cluster membership and the standardized discriminate function coefficients were: Built own 0.94, self-stated innovativeness 0.27, average number of layers 0.25, satisfaction –0.23, year adoption –0.16 surface mounting 0.15.

Concept of questionnaire showed that respondents strongly preferred the lead user group PC-CAD system concept to any other. 78.6 percent of the sample selected the lead user creative group concept as their first choice. The constant sum scaled preference value was 2.60 for the concept developed by the lead user group. This was thirty nine percent greater than users' preference for their own current system and more than twice as great as the preference for the most advanced existing commercially available product offering. For the lead user concept, the probability of purchase increases from 51.7 percent to 63.0 percent when the price is decreased from $150,000 to $100,000 and drops to 37.7 percent when the price is increased to $200,000. The preference for the lead user group concept was significantly higher than other alternatives at all price levels.

If lead user data is to be valuable for the design of products, which will be successful in the wider marketplace, it is important that the product preferences of the typical users are now similar to the preferences of lead users. Von Hippel showed that the preference of lead and non-lead users are similar. They look at lead and non-lead user clusters separately. While

both groups preferred the concept developed by the lead user creative group, a slightly higher proportion of lead users selected that concept as their first choice.

Lead user methodology is a logically straightforward combination of three components, and each of these components has been empirically tested in other contexts. First, the lead user method assumes that users who have experience with a need are better able to give accurate information regarding it than those without such experience. Both common sense and several empirical studies on problem solving support this assumption (von Hippel 1986). Second, it requires that, in fields where need-related trends exist, some people will experience a need under study before others- they will "lead" with respect to the trend. Third and finally, the method assumes that users will differ on the amount of benefit which they can expect from a solution to a need, and that the amount of effort which they will exert to understand and resolve it will vary with the expected benefit.

8.2.4. Lead user and dynamic information (Nortel networks)

From Harvard Business School Professor Clayton Christensen introduced the idea of innovator's dilemma. "When best firms succeeded they did so because they listened responsively to their customers and incorporated the voice of the customer into their next generation products. Paradoxically, when best firms failed, they did so because they listened responsively to the customers and incorporated the voice of the customer into their next generation products."

Eric Von Hippel, Professor, MIT Sloan School of Management, says, "The lead user process is among the most effective techniques to build a best-in-class *innovation process.* Anthony Hall, Director of The Future Human-Centric Solutions (FHCS), says, "Nortel

Network has a vast amount of experience in end-user research. Lead user research will be an important tool for Nortel Networks to discover breakthrough concepts quickly."

FHCS team at Nortel Networks and Dr.von Hippel's team works together to identify three main objectives. First objective was to discover the critical needs of lead users second one was to find out potential solutions that address lead user critical needs and last one was to test hypothesis that the DPT (Dynamic Information Transfer) concept is a potential solution for mobile lead users. Given the objectives and the details in the mobility landscape, the team defined an application space helped determine the identification of lead users. As we know that all lead users were to have one or more of these characteristics: Need for real time data transfer, need for location base information, and need for data and voice integration, wireless internet user and critical issues with profound implications for life. From these characteristics, the aim was to find users who expressed an extreme need for one or more of the characteristics. Lead users would also be innovating solutions to address these critical issues.

There are two main steps to find lead users for that project. First thing is that to find lead users. Interview them to categorize their critical needs and find out the degree to which they innovate to meet those needs. The crucial point is that lead users are rare; the success of this phase depends on the ability to network and reach them. The second procedure was to bring together this unique group of lead users to work together collaboratively to solve specific problems in the defined application space.

They contact many people from different industry group who needs or using wireless communication system. By talking with many users, the team was able to find the lead users among the contact. Once they make first preliminary contact, the team member evaluates the

level of knowledge and the level of innovation for the users. If the team member believed that the user wasn't a lead user, they asked for referrals of colleagues who better fit into the lead-user category. End of the first procedure the FHCS team was able to identify more than twenty lead users. Next phase of the lead-user process was to bring together the lead users to collaborate and assist in the design of solutions to address their extreme needs. The FHCS team brought together nine lead users, a subset of the more than twenty lead users identified and interviewed, to explore the dynamic attach, store-and-forward caching, ad DIT concepts. Also team would plot a roadmap forward from today's mobile infrastructure.

Lead users get bring together who can articulate their critical needs and had planned extremely innovative solutions to meet those needs. For the workshop those people invited for lead user group member, animal tracker, storm chasers, a next generation law enforcement technologist, an aviation specialist, a mobile telemedicine researcher and broadcast engineer. They described themselves the challenges they face in their work, a key innovation. The FHCS team created a lead user expedition. This scenario placed the lead users in a made up world that enable them to work on tangible problems outside of their domains of expertise Two team established and first team member focus on to design the dynamic tether concept and second group is designing the store-and forward caching concept. For each group was asked to design the network and devices given the requirements of the expedition scenario. During that workshop as a result, innovations started to emerge. The creative portion of the workshop ended with a list of key innovations. End of the workshop each group created a solution idea for wireless infrastructure to support voice, data and video communications. The infrastructure was represented by a number of elements. The first element was a human communicator device for each explorer. This device would transmit and receive voice, data,

and video and it included location tracking. The second element was an autonomous data/video device that collected data and transmitted. Other element was a satellite uplink from the base camp to the outside world. Three days workshop ended with a presentation of the Dynamic Information Transfer concept. All of the lead users found a DIT to be a useful concept with endless applications. The lead users presented insight, including consideration for the variety of data and control over the activation of the DIT capability. Standard will be important to define the chain of events and information model for DIT.

End of the workshop; lead users were successful to idendify opportunities in mobile services, device, and technologies across multiple industries. Dr. Christensen (1997) states, " Disruptive technologies bring to a market a very different value proportion than had been available previously. Generally, disruptive technologies under-perform established products in mainstream markets. But they have other features that a few fringe (and generally new) customer value Products based on disruptive technologies are typically cheaper, simpler, smaller, and frequently more convenient to use". By adopting and integrating the process with other research and methodologies, Nortel Networks demonstrated that the DIT concept is a disruptive innovation for the future wireless Internet.

Chapter IX

9. Methodology and Data Set

Media Metrix is a leading provider of Internet and Digital Media measurement products and services. The company starts to measure usage of the entire digital landscape, including its largest segments. In the market their measurement data met with huge demand by advertising agencies, new and traditional media companies, e-marketers, technology companies and financial institutions. They have currently international operation too. Company is setting the global standard for Internet and Digital Media audience measurement. Media Metrix data are used to buy, sell and plan advertising, support marketing and commerce initiatives, Asses partnerships and distribution strategies and analyze competitors.

Media Metrix patented metering methodology, which collects actual usage data from randomly recruited, representative samples of tens-of-thousands of people in homes and business around the world. The meter is a software application that works with the PC operating system to passively monitor all user activity in real time click-by-click, page-by-page, and minute-by-minute. The usage data are aggregated to create the most extensive and comprehensive database of actual Digital Media usage available today. Whole Universe is defined as all those individuals who used the Internet or any Digital Media at home, at work or at college during the past 30 days. Media Metrix takes two complementary approaches to the measurement of banner advertising, a sample approach (The Ad Network Report), and a competitive tracking approach (AdRelevance). Our data source comes from The Ad Network Report. Using audience measurement Methodology, Media Metrix records each file requested by a user. All banner ads being viewed by the sample and classify them according to the Network responsible for the distribution, for example AdSmart, Flycast Network. Actual and

potential reach of each of the major network data available. Ad Networks and their channel are tracked across key measurement criteria including measures (Reach % and Unique Visitor (000)) and frequency measures (Day, Pages, Time, and Spent per Person). Also audience estimates and audience composition are provided across age within gender demographic groupings and household demographics. Monthly report intervals are between First day of Month and last day of Month. When I say April 1999 reports includes data from April 1, 1999 through April 31, 1999.

For our study we used 15-major Ad Sales Network and this report divided two major sections Actual Reach and Potential Reach data sets, there are two way to measure Ad Networks. ***Potential Reach*** one of the way of estimating the reach and audience composition of an Ad Network is to sum up the unique audience across all the sites in the Ad Network as a whole and Ad Network Channels, individually. Ad Sales Networks has contracted with Media Metrix and signed an agreement stating the company understands and will comply with the guidelines established by Media Metrix. ***Actual Reach*** second method to estimated the reach and audience composition of an Ad Network is to count the audience that received an ad provided by a third party ad server. For the real-time panel, Media Metrix has the technical capability of measuring when a user receives an ad and, therefore, has the ability to calculate Actual Reach. They are using real-time software, that software contains all data representing the origin of all the sources. This ability to evaluate third-party ad server activity on all websites enables performance measurement. It is an accurate measure of the ads viewed.

Media Metrix is using two similar tracking meters are used to collect web usage activity. One-third of the panel currently uses the Media Metrix real-time tracking software to detain

and transmit the web usage activity. Internet users install the software on all computers that the Household members use to access the Web in their place of residence and their place of work. Each household member chooses himself or herself from list of software's user identification screen. The software passively records all Webs browsing activity, sending all clickstream data, user demographic and computer information to Media Metrix servers in real-time, as the user moves about the Web. If the computer has been inactive for more than 30 minutes, the meter requires indicating again who is at the computer. Second tracking software name is Media Metrix PC Meter software; users also install on all computer in the at home and primary computer sat work. On the first day of each month, a retrieval disk arrives via mail at the respondent's home and place of work, with instructions n how to download the collected data. The disks are returned to Media Metrix for reading, processing, coding, and tabulation over the following several weeks.

Projecting the Samples each quarter, Media Metrix uses probability sampling and random-digit dialing methodology to specify the people in the U.S. who use the World Wide Web on a monthly basis. From this enumeration, estimates of the number of Web Users and their demographic characteristics are derived. Universe estimates are updated on a quarterly basis to see the rapid growth of Web users. The sample of users who used both at home and at work are weighted on a grid composed of age, gender, and presence of children, household size and household income. As is normal in research practices, the weights of all panelists in each demographic category will differ slightly from the target population. The targets for the demographic categories are show in the Table 9.2.

Table IX.1.World Wide Web and Digital Media Universe Estimates

World Wide Web and Digital Media Universe						
	WWW	*Digital Media*	*WWW*	*Digital Media*	*WWW*	*Digital Media*
1. Persons 2+, Used the Web At Home past 30 days	74,054	76,443	75,359	77,714	75,783	78,073
2. Adults 18+, Used the Web At Work past 30 days	26,990	27,546	27,622	28,135	27,787	28,317
3. Adults 18+, Used the Web At Both past 30 days	23,605	24,130	24,447	25,192	24,809	25,406
All: Persons 2+, Used the Web At Either Home or Work past 30 days	77,439	79,859	78,534	80,657	78,761	80,984

Sources: Media Metrix World Wide Web Audience Ratings, October 2000. Ad Sales Network Report

Work with the Home and Work Samples, in order to measure total computer usage, all person whoever recruited should install the Media Metrix meter at all locations where she or he uses a computer and connect to the Web. But some people will install the meter at home

Table IX.2.Media-Metrix Data Sets Key Demographic list

DEMOGRAPHICS		June '00 UNIVERSE Pop. (000)	%	DEMOGRAPHICS	June '00 UNIVERSE Pop. (000)	%
Males	12+	**35,237**	**46%**	New England	5,390	7%
	12-17	4,637	6%	Middle Atlantic	9,895	13%
	18-34	14,249	19%	South Atlantic	12,497	16%
	35-49	10,031	13%	East South Central	3,785	5%
	50+	6,321	8%	West South Central	7,581	10%
Females	12+	**35,325**	**46%**	East North Central	10,645	14%
	12-17	4,442	6%	West North Central	6,712	9%
	18-34	12,797	17%	Mountain	5,201	7%
	35-49	11,927	16%	Pacific	14,650	19%
	50+	6,158	8%			
Children	2-11	5,798	8%	< $25,000	7,449	10%
				$25,000 - $39,999	12,245	19%
				$40,000 - $59,999	20,828	27%
				$60,000 - $74,999	9,685	13%
1 persons		5,986	8%	$75,000 - $99,999	10,506	14%
2 persons		19,652	26%	$100,000 +	13,647	18%
3 persons		14,672	19%			
4 persons		19,193	25%	Yes – Children	42,031	55%
5+ persons		16,857	22%	No Children	34,329	45%

but not at work. The same, some people install at work but not at home. Three terms (at home, at work and at both) can be combined to produce an estimate of the total number of people using the World Wide Web, at home or at work. If we know how many different people used at home and how many different people used at work and then if we combine these two numbers to gets total users. For those total users we do have list of demographic information. Demographic variable list also listed on the Table 9.2. There is a biggest possible problem is that some people will have double counted who used in places, home and wok. The estimate of the number of persons who used in both place is produced, however, and can be subtracted from the duplicated total resulting in the Net Unduplicated Audience.

Chapter X

10. Leading Edge Users for the US Internet Users

Media Metrix Company has been the largest data supplier since 1996. Its branches in both domestic and international locations have placed two tracking software into their clients Internet users' computers to obtain monthly activity reports. This software is called (i.e. The media Metrix Real Time Tracking Software and PC Meter Software) and in turn, clients whose daily Internet activities are monitored and they were paid a monthly fee by Media Metrix as part of deal.

As expected, Internet service providers (ISP) were very few when they started emerged in 1996. In this study we used the data pertaining to after August 1998 until December 2000. These 29 months of data in Ms.Excel format has been utilized in this dissertation. Data from 1996 to August 1998 is not available for this study. Supplied data was originated from top 15 Internet Service Providers. Although some of the data set covered whole 29-month period. Some of them did not because some companies established after August 1998. Processing of the aforementioned data required intensive computer time and manual labor time. There is no fixed format for each data file. This monthly data are composed of actual and potential data.

10.1. Econometric Model

In this study, our goal is to find leading demographic characteristics of online users in which their behaviors significantly close to all of the online users' preferences. Our methodology and capacity is not able to find exact individual person to call him or her as a leading edge person for online usage purpose. Based on our available data set, we could only

figure out focus groups' demographic characteristics by using advanced econometrics (i.e., Robust Estimation, LAG operation), statistical tools, and data analysis techniques.

In this study our main difficulty is, for 29 months separate data file, to put in order any variable under the category of months, domain name, web page name, gender, household characteristics, income level, age and regions. Success of econometric results depends on appropriate time series. Monthly data sets had been created under different Domain Company Names and all major web sites data are listed under the main web category. For any web category we do have the data to show how many users visit for each month, frequency table, gender information, household demographic characteristics and the number of online users from each region to visit them web sites. 24/7 Media group, Doubleclick, Burst Media group, Xoom domain name data is available most of the 29 months period. When we started to create time period for each domain, time series varied base on domain name. It takes a lot of time to create time series under five main constraints. On the time series, we spent too much attention to put nicely everything in order, under the same domain name, and ever-separate month, put them data to the row carefully below.

Universe→Actual Data or Potential Data→Month of Data set→Domain Name→ Name of Web category→Name of Web Sites→ and more than 42 attributes of online users data listed on the column for number of online users and percent of composition (Reach & Frequency Distribution, Gender by age, household information, Regions). To get the results in the first part, data's were sorted under those categories and graphs and tables were created for each data group separately.

From main data set those data group created

1) Actual data for All Domain name 2) Potential data sets for All Domain name.

3) Actual data for web site by category 4) Potential data by web site category.

Coverage of those four data group's variable is exactly the same variable for each data group (see list of variable Table 9.2). First and second group data sets include only All Domain Name information. There are 15 major domain names. Third and fourth data group coverage area is only web page. On the data set there are more than 100 different web page categories. We created only 14 new web-pages data group by using those 100 web sites. Again same as first and second group there are 42 variable for this data group also. For each web-page category or Domain name we run single equation regression to find R^2 for each variable. Depended variable is always same, Y total number of internet visitor, from home and work for explicit domain name or web page category.

Single-variable regression equation

$$Y_{it} = \alpha_{it} + \beta_{it} X_{it} + \varepsilon_{it} \qquad (1)$$

In economics the dependence of a variable Y on another variable X (the explanatory variable) is rarely instantaneous. Very often, Y responds to X with a lapse of time. Such a lapse of time is called a lag. Psychological reasons, technological reason or any other reason people not show reaction immediately. People respond comes later on next month or next year. On the Internet market any changed brings instantaneous respond, to make is short to decide for any new result or changed. One month time period is enough time periods to decide to show respond for any new web site changed. That's why we used Lag (1) equation to see Internet users preferences changed and behaviors, (equation 2).

LAG (1) equation is show below

$$Y_{it} = \alpha_{it} + \beta_{it} X_{it-1} + \varepsilon_{it} \qquad (2)$$

Y_{it} : Base on certain web-site category total online visitor giving month (t).

X_{it-1}: from list of variable on the Table 9.2, for each variable, total online monthly visitors as of previous months.

We bring here one-regression results to discuss methodology; data sample group from Web Site category is automotive related web sites, (Table 10.1). From different domain all automotive related web site information collected. Data is Potential Data sets and again cover 29 months period. In this study we run one variable regression and got coefficient and R^2 for each variable. We have 42 Variable coefficients and regression results for each domain name or web page category. After we have all regression results (it's approximately 5000 regression results), first thing we did, and short each single variable regression variable R^2 number by descending and determine the first top 8 variable names and R^2's. After we completed the same procedure for all variables (almost 5000 times) we put together first 8 highest R^2 variable results on the table. And then we started counting each variable, which is repeated within the first eight top groups. Purpose of this process showed us which variable was repeated the most of the times. For example, on the Table X.2, New England is 2, it's mean that after we run 5000 regression only and only 2 times New England variable counted within first top 8 variable groups. Using those summary tables, we tried to put together all results on one big table to get the final number for each variable which is showed, which variable is the most repeated or counted during the whole process. In order to see variable rank simply, we decided to use 8 different colors for each R^2 to show its rank within first 8 variables. For example, if we

see a red color for any variable, it means, that variable's R^2 is the highest one, blue color means fifth highest R^2 value.

Table X.1. Single Variable Regression result for Automobile

Pres.of Children	NoChildren	X39	99.1%	First Highest R-square
	Home	X4	99.1%	Second Highest R-square
Pres.of Children	YesChildren	X38	99.1%	Third Highest R-square
Women	Women 18+	X32	98.8%	Fourth Highest R-square
	Home/Work	X2	98.6%	Fifth Highest R-square
Women	25-49	X35	98.3%	Sixth Highest R-square
Women	35-54	X36	97.9%	Seventh Highest R-square
Income Level	$60k-74.9k	X48	97.8%	Eighth Highest R-square

Data Potential Data Set
Time Period 08/98 to 12/00
Number of Variables 42
Number of Sample 147

End of the econometric analysis, all result summarized in one big table, Table X.2, and this table include three data category. First group named "All Domain Name Category", "Web Site Categories" and last data category called "Ranking" which is it's a combination of first two data category. On the third category, last column give explanation which variable has leading characteristics.

On the last column ranking all variable from highest to lowest, highest mean how many times a variable yielded a highest R-square results. (R-square is coming out end of each Single-Variable Regression), for example, first number on the last column is 63, name of variable

called "Home" (Home stand for online user connected internet at home) 63 times get the greatest R-square value. On the last column for each unique variable we found a number using both first and second data category. Those numbers demonstrate the greatest number of R-square is yielded. Second highest number on the last column is Female 18+ variable. It's 50 times second greatest R-square occurs. Third highest number on the last column is Male18+, it's 44 times counted as a third greatest R-square results. And so on.

Last column is ranked from highest to lowest result (results meaning, a variable the greatest number of R-square is yielded). Instead of using only that indicator we added second indicator to help us to see easily greatest result among 42 variables is the color-coding, also black and white coding (color keys are provided on the Table X.2, same code used for black-white version first highest require by black color, then gray %40 color, gray 25% color, gray 6.5% color, reverse diagonal stripe, thin diagonal stripe, thin horizontal stripe, thin vertical stripe). Color-coding one other advantage is that make it easy to comparison among variable to see close relationship among variables. Red color indicates the greatest R-square result and following color second greatest R-square yellow and so on. Same thing for black-white coding is black color indicates the greatest R-square, gray 40% color second highest R-square and so on.

On the Table X.2 first two data category combined to produce last data category that shows variable rank. First data category, it's called "All Domain Name Category" (its comes from Table X.3, Table X.4, Table X.5 and Table X.6 results) this group result comes from 15 Domain name's regression result. Using the same 42 variables one by one on the single-variable regression for each Domain name, for each single-regression result picked the highest

first eight R-square's variable. Same process is repeated for LAG (1) regression operation to get first 8 highest R-square results. On the second data category results comes from "Web site Categories". On the existing data sets there are 14 web-page categories. There are two sets data group, actual data and potential data, for each web-page category plus there are 42 variable for each web-page category. Ranked those variables's R-square from highest to lowest.(Table X.7 and Table X.8).

In order to get third data category, from first group for first variable "Home" counted R-square 13 times as a first highest R-square, 4 times second highest, 9 times third highest result so on. When we look at second data category for the same variable "Home" 7 times counted as a second highest R-square, 2 times third highest R-square and so on. In order to get last final data result, first highest result for all domain category and combined it first highest result of the web site category for same variable to get the first highest number in the third data category "Ranking" and so on. After that we combined all number on the same row in the third group in order to get sum columns (Last Column on the third data category). After repeating the process for each row, sum column ranked from highest to lowest to see which variable has strong leading characteristics among 42 variables.

First eight variable Sums' has highest-ranking occurrence of variable, therefore, those eight variables demonstrate leading character. Listed variable's name from highest to lowest rank as Home, Females18+, Males18+, NoChildren, Household size 5+persons, YesChildren, Household Income $25K-$39,999, Pacific Region, Home-Work Internet Users, and next three variable has a potential leading characteristic. On the first two data category again first eight focus group almost same as final leading group variable only difference is household income

level less than $25K variable is counted on the first eight for first date category (All Domain Name). For Web-Page data category regression result again first eight variable almost same as final leading group except Household Income level ($60K-$75K) is counted as a leading group variable. (Table X.9)

Table X.10 shows ranking base on variable category (Gender, Household Demographics and Region). The most important age category for Males and Females are the same within the first second and third highest-ranking list. Household size (5+People) variable is the most important variable for household Size category and second one is household size 2 people. For Income level, the greatest variable bracket is ($25K-$40K) and second one is income level less than $25K household has important leading character. And final variable group is from Region. Pacific region Internet users have important leading behavior.

10.2. Leading Index

In order to test final leading variable's group (eight variables, Table X.9) we established ***Leading Index.*** In order to test hypothesis, take first 8 variables, leading characteristics variable, and plug into multivariable regression equation to show the best predicted Y, (see equation #3, #4).

First Leading equation;

$$Y=-21829+1.38*(Men18+)+1.86*(5+People)+0.53*(Female25-49)+0.33*(YesChildren)+e \quad (3)$$

(6.62) (6.32) (2.49) (1.23)

And second Leading Index equation is:

$$Y= 9328+0.68*(Women18+) + 0.03*(Pacific) +1.31*(NoChildren) + e \quad (4)$$

(4.45) (0.37) (11.46)

First leading equation prediction very strong as we can see on the Figure X.1 and Figure X.2. Number is in the parenthesis indicated t-values and computed t-values exceeds the critical t-value, we may reject the null hypothesis and say that β_i's coefficient are statistically significant, that is, significantly different from zero. F-test has significance result to show all coefficients statistically significant (Table X.11 and Table X.12). Leading index regression result listed on the Figure X.1 and Figure X.2.

Those eight the best-selected variable are our focus group or leading group for marketing strategy. It's very useful for marketing purposes in order to narrow downs marketing strategy so that one does not need to concentrate those 42 variables. What information you get from those 42 variable, one can just focus on eight get the same result and information. This allows for marketing advertiser to pin point their marketing strategies smaller domain and yield same results. Secondary benefit to use those leading group is saved research effort, time and expenses.

Online ad spending has huge growth potential. As of June 2000 in North America ad spending total amount was $5 billion. And forecast ad spending in year 2005 will be $16 billion, from Jupiter Communication estimated ad report, Table 10. For successful advertisement strategy require to know users preference and target some select users group to get better acquired forecast result at this point our leading edge group information will be useful to give better idea.

The top sectors for online ad spending in 2001 were Retail ($533.3 million) and Media and Advertising ($450.5 million). Yahoo held on to its position as the top property for online advertising revenue with more than $344 million for the year, Table X.13-15.

Chapter XI

11. Summary and Conclusion

11.1. Conclusion

Using traditional techniques new idea generation base on customer input collect information on new product needs from a random or typical set of customers, collect information from users at the center of the target market. Many firms generate new product ideas based on information collected from current or potential users. In the traditional idea generation paradigm, idea generation involves first identifying and quantifying the intensity of needs shared by many users and then having internal manufacturer personnel strive to create an idea for a novel product that users will find responsive to those general needs. The lead user process collects information about both needs and solutions from users at the leading edge of the target market. New methods to obtain information from lead users, and build that information into commercially new product and service offerings.

Early and gradual (though thoroughgoing) deregulation made the U.S. the leading economy for innovation. In sharp contrast, in most of Europe and Asia the dominant government owned monopolist (even in 2000) exerted undue influence. The flat-rate tariff structure for local phone calls was remarkably important for the diffusion of online services and the uptake of the Internet in the home market. The macro-level deregulation created a

powerful competition that drove bandwidth costs down, encouraging ever-greater use of the telecommunications system and the Internet. The leading US economy needs a leading users, or focus group. There are many ways to find leading group base on study. Our leading edge study required using econometric method to maximize R-square and then ranked the most repeated variable by highest R-square number. First eight top numbers, which is, repeated the most of the times and we called those eight variables as a leading group. Leading index help us to test our finding and its shows the best estimate result. More than half of the US population connects to Internet. It's very difficult to identify certain people as a leading edge group member. Instead of find a certain people, we tried to describing characteristic of leading group. Our 8 leading group variables have also dominant characteristics on the First essay. On the First essay we showed that pacific region users are the most active online users, and more than 50 percent of US online users are Women, and age group between 25-49 is the most active users age. If online user family does not have child, they do have more time for online and they have much stronger leading characteristics then that has children. Household size more than 5 person also leading characteristics to help us identify next step of Internet marketing strategy. Household income $25K to $40K level mid-income level family using more Internet than any other group but low level income family interest growing faster then any other group. Also important thing to find very active income level family to focus on those groups for marketing purpose. Male (age over 18) has strong leading characteristic same as Women and 25-49 age group for Men also very active online users group.

11.2. Appendices

11.2.1. About eCommerce-Pulse:

The eCommerce-Pulse service integrates eCommerce survey data collected from Harris Interactive's online panel of more than seven million users with data and insights from Nielsen/NetRatings' Internet audience measurement panel. ECommercePulse is the first single-source eCommerce intelligent service for merchants, investors and suppliers. Covering more than 300 eCommerce sites across 14 key vertical markets, eCommercePulse provides integrated monthly reports on eCommercePulse behavior, trends and spending. Critical information on purchaser and revenue share, and customer satisfaction metrics, including market-level and site-level traffic enables companies to make informed, strategic business decisions.

11.2.2. About Harris Interactive:

Harris Interactive (HPOL), the global leader in online market research, uses Internet-based and traditional methodologies to provide its clients with critical knowledge concerning the views, experiences, behaviors and attitudes of people worldwide. Known for the Harris Poll, Harris Interactive has 45 years of experience in providing its clients with market research and polling services including custom, multi-client and service bureau research, as well as customer relationship management services. Through its US and Global Network offices,

Harris Interactive conducts research around the world, in multiple, localized languages, using its proprietary technology to survey its database of more than 7 million online panelist. Company's web site is at www.harrisinteracive.com.

11.2.3. About Net-Ratings, Inc.

NetRatings, Inc. (NTRT) is a leading provider of Internet audience measurement information and analysis. Its products and service enable customers to make informed business-critical decisions regarding their Internet strategies. NetRatings has strategic relationships with both Nielsen Media Research, the leading source of television audience measurement and related services in the US and Canada, and ACNielsen, a leading provider of market research information and analysis to the consumer products and services industries.

11.2.4. About Nielsen//Net Ratings:

Nielsen//NetRatings, the audience measurement service from Nielsen Media Research and NetRatings, Inc., collects real-time data from more than 70,000 panel members in the United States. The US panel sample consists of 62,000 at home users and 8,000 at work users. These panels collectively represent the largest representative media research sample of Internet users in the Industry. Worldwide, measure the Internet experiences of more than 220,000 Internet users.

Table X.2. US Online Users Leading Edge Group Summary Table

Data Sets Period Agust 31,1998 to December 31,2000

From Highest R-square to

1	2	3	4	5	6	7	8

		All Domain Name Category								14 Web Site Category								Ranking								
DEMOGRAPHICS		1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8	
Persona 2+																										Sum
Category	Attributes																									
REACH & FREQUENCY	Home	13	4	9	2	4	5	1	3		7	2	3	4			6	13	11	11	5	8	5	1	9	63
Females	18+	5	4	5	5	3	4	2	2	2		5	3	3	3	2	2	7	4	10	8	6	7	4	4	50
Males	18+	2	1	1		6	3	2	3	3	2	8	2		2	3	6	5	3	9	2	9	5	5	9	44
Presence of Children	No Children	4	10	5	1	1	1	2	3	3	9	1		1	1	1	1	7		6	1	2	2	3	4	44
Household Size	5+ persons	2	1	2	7	3	3	1	9			1	3	1		3	6	2	1	3	10	4	3	4	15	42
Presence of Children	Yes – Children	5	2	2	5	3	2	1	2	6	3	2	2		1		3	11	5	4	7	3	9	1	5	36
Household Income	$25,000 - $39,999	2	2	1	4	3		9	3	2	1	1		1	3	2	5	4	3	2	4	4	3	11	8	39
Census Region	Pacific		2	1	3		3	2	13			2	1		2	1	3	0	2	3	4	0	5	3	16	33
REACH & FREQUENCY	Home-Work	1	1				1			12	1		2	2	3	3	2	13	2	0	2	2	4	3	2	28
Females	25-49	1	1	1	3	1	1	1	4		2	1	2	2	4	2	1	1	3	2	5	3	5	3	5	27
Females	35-54	1	1			4	3	3	2			1	1	3		2	6	1	1	1	1	7	3	5	8	27
Household Size	2 persons	1	2	2	2	2	2	3	3					2	2	2	3	1	2	2	2	4	4	5	6	26
Household Income	< $25,000	2	2	2		2	3	6	4								3	2	2	2	0	2	3	6	7	24
Males	25-49		1	1	1	1			2				4	2	1	1	6	0	1	1	5	3	1	1	8	20
Household Income	$40,000 - $59,999		2		2		2	1	2		2	2		3	2		2	0	4	2	2	3	4	1	4	20
Household Income	$60,000 - $74,999				1							1	4	2	2		9	0	0	1	5	2	2	0	9	19
Males	35-54			2	2				1					1		4	7	0	0	2	2	1	0	4	8	17
Census Region	South Atlantic		1		1	2	2		4								2	0	1	0	1	2	2	0	6	12
Females	25-34		1	2			2	2	1							2		0	1	2	0	0	2	4	1	10
Females	55+			1			3	1	3			1						0	0	2	0	0	3	1	3	9
Household Income	$75,000 - $99,999		1	2				1						1	1		3	0	1	2	0	1	1	1	3	9
Males	55+				1	1	1		3								1	0	0	0	1	1	1	0	4	7
Census Region	Middle Atlantic		1	1	1	1		1	1								1	0	1	1	1	1	0	1	2	7
Males	18-24	1	2				1		1								1	1	2	0	0	0	1	0	2	6
Household Size	1 persons		1			1		1	2								1	0	1	0	0	1	0	1	3	6
Household Size	4 persons			2	1				1								2	0	0	2	1	0	0	0	3	6
Males	25-34		1	1				1									2	0	1	1	0	0	0	1	2	5
Household Size	3 persons			1	1				1						1			0	0	1	1	0	1	0	1	4
REACH & FREQUENCY	Work																4	0	0	0	0	0	0	0	4	4
Census Region	West South Central			1		1		1										0	0	1	0	1	0	1	0	3
Census Region	Mountain		1		1		1											0	1	0	1	0	1	0	0	3
Household Income	$100,000 +				1	1											1	0	0	0	1	1	0	0	1	3
Females	18-24	1									1							1	1	0	0	0	0	0	0	2
Census Region	New England				1			1										0	0	0	1	0	0	1	0	2
Census Region	East South Central					1												0	0	0	0	1	0	0	0	1
Census Region	East North Central					1												0	0	0	0	1	0	0	0	1
Census Region	West North Central							1										0	0	0	0	0	0	1	0	1
Kids	2-11																1	0	0	0	0	0	0	0	1	1
Teens	12-17	4	1		4			1	2									4	1	0	4	0	0	1	2	12

All Domain Name:Sum up from Tables X.3,X.4,X.5,X.6

14 Web Site Category:Sum up From Table X.7 and Table X.8

Ranking: Sum of Both All Domain Name and 14 Web Site Category

Table X.3.Actual Data Sets for All Domain Names

Period: Agust 1998 to December 2000

From Highest R-square to Lower R-square Ranking List

1	2	3	4	5	6	7	8

DEMOGRAPHICS		ALL DOMAIN NAMES	24/7 Media	Adsmart	BurstMedia	DoubleClick Network, The	Engage Media	ValueClick	Flycast	LinkExchange Network
Males	18+		0.9223			0.8521				
	18-24									0.8831
	25-34									
	25-49						0.9613			
	35-54							0.9358		
	55+									
Females	18+	0.9202	0.9410			0 9366	0 9914	0.9047		
	18-24									
	25-34		0.9032							
	25-49		0.9309			0.8791	0.9291			0.8940
	35-54		0.8911			0.8422	0.9656			0.8969
	55+	0.9248								
Kids	2-11									
Teens	12-17	0.9557								
	Yes – Children			0.8679	0 9934		0.9439		0 9767	
	No Children									
	1 persons									
	2 persons	0 9547						0.9059	0.9303	
	3 persons									
	4 persons									
	5+ persons				0.9477	0.8827		0.9004	0.9429	0.9254
	New England									
	Middle Atlantic			0.8708					0.9237	
	South Atlantic			0.8709	0.9437					
	East South Central									
	West South Central									
	East North Central									
	West North Central									
	Mountain									
	Pacific			0.8152	0.9747	0.8109		0.9333	0.9240	
	< $25,000	0.9256	0.8558	0.8021	0.9308	0.8396				0.8699
	$25,000 - $39,999	0.9383		0.8788	0.9355			0.9664	0.9231	
	$40,000 - $59,999									
	$60,000 - $74,999									
	$75,000 - $99,999									0.8676
	$100,000 +									
	Home-Work									
	Home	0.9318	0.9477	0.9420	0.9785	0.9044	0.9694	0.9850	0.9665	0.9688
	Work									

Table X.4.Actual Data Sets (LAG 1) For All Domain Names

Period: Agust 1998 to December 2000

From Highest R-square to Lower R-square Ranking List

1	2	3	4	5	6	7	8

DEMOGRAPHICS		ALL DOMAIN NAMES	24/7 Media	Adsmart	BurstMedia	DoubleClick Network, The	Engage Media	ValueClick	Flycast	LinkExchange Network
Males	18+									
	18-24									
	25-34									
	25-49									
	35-54							0.7850		
	55+					0.2734				
Females	18+						0 6481			
	18-24									
	25-34									
	25-49				0 7809					
	35-54									
	55+									
Kids	2-11									
Teens	12-17	0 9486		0.3922		0 3067			0.6542	
	Yes – Children				0.7219			0 8116		
	No Children									
	1 persons									
	2 persons									
	3 persons									
	4 persons									
	5+ persons		0.5061	0.3412						
	New England									
	Middle Atlantic									
	South Atlantic									
	East South Central									
	West South Central									
	East North Central									
	West North Central									
	Mountain									
	Pacific									
	< $25,000			0 4476						0 4510
	$25,000 - $39,999		0 5177							
	$40,000 - $59,999									
	$60,000 - $74,999									
	$75,000 - $99,999									
	$100,000 +						0.5695			
	Home-Work									
	Home	0.9068							0.7019	0.4162
	Work									

Table X.5.Potential Data Set for All Domain Names

Period: Agust 1998 to December 2000

From Highest R-square to Lower R-square Ranking List

1	2	3	4	5	6	7	8

DEMOGRAPHICS		ALL DOMAIN NAMES	24/7 Media	Adsmart	BurstMedia	DoubleClick Network, The	Engage Media	ValueClick	Flycast	Excite Adv Net.	Excite-Home Ad Netw.	Pogo.Com	Real Media	Xoom Netw	StartPath	Mail Com	Link Exchange Network
Persons																	
Males	18+									0 9361			0 9750				
	18-24																
	25-34																
	25-49																
	35-54											0.9845					
	55+	0.8253	0.9198	0.8674		0.9169								0.9386			0.9459
Females	18+	0.9198	0.9673	0.8510		0 9717								0.9654	0.9930	0.9036	
	18-24																
	25-34					0.9043								0.8791			0.8875
	25-49									0.5943							
	35-54								0.9694		0.9802						
	55+			0.8172							0.9591						
Kids	2-11													0.8732			
Teens	12-17													0.8676			
Presence of Children																	
	Yes - Children					0.9458	0 9871		0.9846	0.7976			0.9241	0 9843	0.9963		0.9670
	No Children	0 9781		0 9394	0 9742										0.9954	0 9850	
Household Size																	
	1 persons																
	2 persons						0.9664			0.6564			0.9666				
	3 persons						0.9248						0.8814				
	4 persons																
	5+ persons						0.9078						0.8784				
Census Region																	
	New England																
	Middle Atlantic			0.7829	0.8888						0.9856	0.9725					
	South Atlantic			0.8112	0.9272						0.9816	0.9762				0.8921	
	East South Central																
	West South Central																
	East North Central											0.9830					
	West North Central																
	Mountain											0.9799					
	Pacific					0.8427											0.9023
Household Income																	
	< $25,000								0.9580		0.9653				0.9804		
	$25,000 - $39,999								0.9693				0.8849				
	$40,000 - $59,999																
	$60,000 - $74,999																
	$75,000 - $99,999																
	$100,000 +																
REACH & FREQUENCY																	
	Home-Work						0.9541					0 9939					
	Home			0.4616			0.9539		0 9962	0.6051	0 9952	0 9930			0 9983	0.9717	0.9817
	Work																

Table X.6.Potential (LAG 1) Data Set for All Domain Names
Period: Agust 1998 to December 2000

From Highest R-square to Lower R-square Ranking List

			1	2	3	4	5	6	7	8						
DEMOGRAPHICS		ALL DOMAIN NAMES	24/7 Media	Adsmart	BurstMedia	DoubleClick Network, The	Engage Media	ValueClick	Flycast	Excite Adv Net	Excite-Home Ad Netw	Pogo Com	Real Media	Xoom Netw	StarPath	Mail Com	LinkExchange Network
Persons 2+																	
Males	18+									0.2673		0.8484	0.6523		0.8936		
	18-24				0.7369												
	25-34									0.3284					0.8937		
	25-49									0.2798		0.8580			0.8881		
	35-54						0.3013										
	55+			0.4116													
Females	18+		0.9040			0.6402				0.6818			0.6811			0.8076	0.8215
	18-24			0.5432			0.7611										
	25-34										0.6825						
	25-49										0.6537						
	35-54								0.7114	0.2759	0.6510		0.7257			0.8162	
	55+	0.6909		0.4026		0.6027			0.6739		0.6500						
Kids	2-11																
Teens	12-17		0.9050						0.7816					0.5415			0.8388
Presence of Children																	
	Yes – Children	0.8158	0.9050												0.8960	0.7974	
	No Children	0.6440				0.6487			0.7092	0.2196	0.6582		0.6890	0.4853		0.8316	0.8545
Household Size																	
	1 persons	0.9191	0.9300			0.6218							0.6686			0.7926	0.8804
	2 persons	0.6761	0.9260	0.3665	0.6767				0.7102	0.2454	0.6691		0.6506	0.4798		0.8360	0.8021
	3 persons											0.8539	0.6327		0.9059		
	4 persons														0.9005		
	5+ persons	0.6651	0.9609		0.6850	0.6486	0.4078				0.6482			0.5049		0.8151	0.8679
Census Region																	
	New England			0.3884					0.7181								
	Middle Atlantic				0.6719										0.9086		
	South Atlantic								0.6999								
	East South Central												0.6825				
	West South Central						0.4290					0.8410		0.5038			
	East North Central																
	West North Central																
	Mountain				0.7014												
	Pacific			0.4007			0.3726		0.7044		0.6613	0.8326		0.5012		0.8076	0.7893
Household Income																	
	< $25,000	0.9502	0.8881				0.3357				0.6564		0.6665	0.4901			0.8180
	$25,000 - $39,999		0.8944	0.3922	0.6291	0.6484			0.6935		0.6381	0.8674	0.6654	0.4757		0.8162	0.8457
	$40,000 - $59,999				0.7287							0.8526					
	$60,000 - $74,999														0.9034		
	$75,000 - $99,999												0.7183				
	$100,000 +										0.6560						
REACH & FREQUENCY																	
	Home-Work																
	Home	0.9068	0.9378	0.4186	0.6940	0.6923	0.3480				0.6525	0.8410	0.7042	0.5252	0.9159	0.8646	0.8248
	Work									0.4410							

Table X.7. Ranking First Eight Variable Using Potential Data Set by Web Page Category (08/98 to 12/00)

			1	2	3	4	5	6	7	8						
14 Web-Site Category Result Using Potential Data	List of Variables				Arts& Entertainment& Music & Sports				Automotive				Business & Finance		Computer & Tech & Internet	
UNIQUE VISITOR	Home/Work	y	Presence of Children	Children Present	x38	[illegible]		No Children Present	x39	[illegible]		No Children Present	x39	[illegible]	Children Present	x38	[illegible]	Presence of Children
REACH FREQUENCY	Home/Work	x1		No Children Present	x39		Presence of Children	Children Present	x38		Presence of Chil	Children Present	x38		No Children Present	x39		
REACH FREQUENCY	Home	x2		5+People	x44	[illegible]	WOMEN 18+	Women 18+	x32	[illegible]		$40k- 59 9k	x47	[illegible]	Women 18+	x32	[illegible]	
REACH FREQUENCY	Work	x3		$60k-74 9k	x48	0.9879		Home	x2	0.9857		5+ People	x44	0.9886	25-49	x35	0.9881	
UNIQUE VISITOR	Home	x4		$40k-59 9k	x47	[illegible]	Reach %	Home/ Work	x1	[illegible]		2 People	x41	[illegible]	35-54	x36	[illegible]	
UNIQUE VISITOR	Work	x5		$25k-39 9k	x46	[illegible]		25-49	x35	[illegible]		$60k- 74 9k	x48	[illegible]	2 People	x41	[illegible]	
	Home/Work	x6		2People	x41	[illegible]		35-54	x36	[illegible]	Reach %	Home/ Work	x1	[illegible]	5+ People	x44	[illegible]	MEN 18+
	Home	x7		Home	x2	[illegible]		$60k- 74 9k	x48	[illegible]		55+	x31	[illegible]	$60k- 74 9k	x48	[illegible]	
	Work	x8	Reach %	Home/Work	x1	[illegible]	MEN 18+	Men 18+	x26	[illegible]		Home	x2	[illegible]	Men 18+	x26	[illegible]	
	Home/Work	x9	Household Size	1Person	x40	[illegible]		5+ People	x44	[illegible]		25-49	x35	[illegible]	$25k- 39 9k	x46	[illegible]	Reach %
	Home	x10		$75k-$99 9k	x49	0.9842		2 People	x41	0.9721		$25k- 39 9k	x46	0.9777	$75k-$99 9k	x49	0.9785	
	Work	x11		Pacific	x59	0.9832		$75k-$99 9k	x49	0.971		$75k-$99 9k	x49	0.9766	Pacific	x59	0.9762	
	Home/Work	x12		4People	x43	0.9813		$40k- 59 9k	x47	0.9655	MEN 18+	Men 18+	x26	0.9743	25-34	x34	0.9732	
	Home	x13	MEN 18+	Men 18+	x26	0.9758		$100k+	x50	0.9651		25-34	x34	0.9732	4 People	x43	0.9731	
	Work	x14		$100k+	x50	0.9733		25-49	x29	0.9637		3 People	x42	0.9719	$40k- 59 9k	x47	0.9722	
	Home/Work	x15	WOMEN 18+	Women 18+	x32	0.9725		4 People	x43	0.9623		4 People	x43	0.9718	1 Person	x40	0.9719	
	Home	x16	Household Income	Under $25k	x45	0.9725		25-34	x34	0.9604		35-54	x36	0.9714	Home	x2	0.9709	
	Work	x17		35-54	x30	0.9713		1 Person	x40	0.9477	WOMEN 18+	Women 18+	x32	0.9712	$100k+	x50	0.9691	
	Home/Work	x18		25-49	x35	0.9692	Household Size	25-34	x28	0.9438		35-54	x30	0.9672	Middle Atlantic	x52	0.9689	Household Income
	Home	x19		Middle Atlantic	x52	0.9689		Work	x3	0.9374		1 Person	x40	0.9595	West South Central	x55	0.9655	WOMEN 18+
	Work	x20		55+	x31	0.9636		Pacific	x59	0.7631	Household Size	Pacific	x59	0.9567	South Atlantic	x53	0.9653	Household Size
	Home/Work	x21		35-54	x36	0.9636		Home/ Work	y			18-24	x33	0.9554	25-34	x28	0.9626	
	Home	x22		25-34	x34	0.9615	Visitors (000)	Home/ Work	x6			West South Central	x55	0.952	35-54	x30	0.9613	
	Work	x23		25-49	x29	0.953	per Visitor	Home	x7			Work	x3	0.9514	25-49	x29	0.959	
	Kids 2-11	x24		Work	x3	0.9451		Work	x8			25-49	x29	0.9457	Under $25k	x45	0.9547	
	Teens12-17	x25		Kids 2-11	x24	0.9262		Home/ Work	x9			25-34	x28	0.9229	Work	x5	0.9525	
	Men 18+	x26		25-34	x28	0.9229	per Visitor in a Day	Home	x10			18-24	x27	0.849	Mountain	x58	0.9508	
	18-24	x27		New England	x51	0.9223		Work	x11			Teens12-17	x25	0.7379	55+	x31	0.9358	
	25-34	x28	Census Region	18-24	x27	0.9198		Home/ Work	x12			Home/ Work	y		18-24	x27	0.9182	
	25-49	x29		55+	x37	0.9046	per Visitor in a Month	Home	x13		Visitors (000)	Home/ Work	x6		3 People	x42	0.8984	
	35-54	x30		Teens12-17	x25	0.9018		Work	x14		per Visitor	Home	x7		Work	x3	0.8946	
	55+	x31		18-24	x33	0.8576		Home/ Work	x15			Work	x8		Teens12-17	x25	0.8717	Visitors (000)
	Women 18+	x32		Home/Work	y		Per Unique Page	Home	x16			Home/ Work	x9		New England	x51	0.8345	per Visitor
	18-24	x33	Visitors (000)	Home/Work	x6			Work	x17		per Visitor in a D	Home	x10		Home/ Work	y		
	25-34	x34	per Visitor	Home	x7			Home/ Work	x18			Work	x11		Home/ Work	x6		
	25-49	x35		Work	x8		Per Usage Day	Home	x19			Home/ Work	x12		Home	x7		per Visitor in a Day
	35-54	x36		Home/Work	x9			Work	x20		per Visitor in a M	Home	x13		Work	x8		
	55+	x37	per Visitor in a Day	Home	x10			Home/ Work	x21			Work	x14		Home/ Work	x9		
	Children Preser	x38		Work	x11		Per Usage Month	Home	x22			Home/ Work	x15		Home	x10		per Visitor in a Month
	No Children Pre	x39		Home/Work	x12			Work	x23		Per Unique Page	Home	x16		Work	x11		
	1Person	x40	per Visitor in a Month	Home	x13			Kids 2-11	x24			Work	x17		Home/ Work	x12		
	2People	x41		Work	x14			Teens12-17	x25			Home/ Work	x18		Home	x13		Per Unique Page
	3People	x42		Home/Work	x15			18-24	x27		Per Usage Day	Home	x19		Work	x14		
	4People	x43	Per Unique Page	Home	x16			35-54	x30			Work	x20		Home/ Work	x15		
	5+People	x44		Work	x17			55+	x31			Home/ Work	x21		Home	x16		Per Usage Day
	Under$25k	x45		Home/Work	x18			18-24	x33		Per Usage Month	Home	x22		Work	x17		
	$25k-39 9k	x46	Per Usage Day	Home	x19			55+	x37			Work	x23		Home/ Work	x18		
	$40k-59 9k	x47		Work	x20			3 People	x42			Kids 2-11	x24		Home	x19		Per Usage Month
	$60k-74 9k	x48		Home/Work	x21			Under $25k	x45			55+	x37		Work	x20		
	$75k-$99 9k	x49	Per Usage Month	Home	x22		Household Income	$25k- 39 9k	x46			Under $25k	x45		Home/ Work	x21		
	$100k+	x50		Work	x23			New England	x51		Household Incon	$100k+	x50		Home	x22		
	New England	x51		3People	x42		Census Region	Middle Atlantic	x52			New England	x51		Work	x23		
	Middle Atlantic	x52		South Atlantic	x53			South Atlantic	x53		Census Region	Middle Atlantic	x52		Kids 2-11	x24		Census Region
	South Atlantic	x53		East South Central	x54			East South Central	x54			South Atlantic	x53		18-24	x33		
	East South Cen	x54		West South Central	x55			West South Central	x55			East South Central	x54		55+	x37		
	West South Ce	x55		East North Central	x56			East North Central	x56			East North Central	x56		East South Central	x54		
	East North Cen	x56		West North Central	x57			West North Central	x57			Mountain	x57		East North Central	x56		
	West North Cer	x57		Mountain	x58			Mountain	x58						West North Central	x57		
	Mountain	x58																
	Pacific	x59																

Table X.7. Ranking First Eight Variable Using Potential Data Set by Web Page Category (08/98 to 12/00)

	1	2	3	4	5	6	7	8
	[redacted]		[redacted]					

		Family Health				Games & Gaming & Hobby				ISP/Portal				Reference &Education & Learning				Shopping& Ecommerce	
Children Present	x38	0.9959	MEN 18+	Men 18+	x26	0.9846	WOMEN 18+	Women 18+	x32	0.9926		No Children Prese	x39	0.9965	Presence of Childre	Children Present	x38	0.9946	
No Children Preser	x39	[redacted]		$25k- 39 9k	x46			25-49	x35		Presence of Children	Children Present	x38	[redacted]		No Children Prese	x39	[redacted]	
$40k- 59 9k	x47	[redacted]		$60k- 74 9k	x48	[redacted]	MEN 18+	Men 18+	x26	[redacted]		$25k- 39 9k	x46	0.99	MEN 18+	Men 18+	x26	0.9924	
5+ People	x44	0.9922	Reach %	Home/ Work	x1	0.9729		35-54	x36	0.984		5+ People	x44	0.989		$60k- 74 9k	x48	0.9891	
$60k- 74 9k	x48	0.9917		No Children Prese	x39	0.9727		35-54	x30	0.979		2 People	x41	0.9887		$40k- 59 9k	x47	0.9882	Reach %
$25k- 39 9k	x46	[redacted]	Presence of Children	Children Present	x38	[redacted]	Reach %	Home/ Work	x1	[redacted]		$40k- 59 9k	x47	[redacted]		$25k- 39 9k	x46	0.9881	
Men 18+	x26	[redacted]		Pacific	x59	[redacted]		25-34	x34	[redacted]	Reach %	Home/ Work	x1	[redacted]		35-54	x30	[redacted]	MEN 18+
35-54	x30	[redacted]		Home	x2	[redacted]		Home	x2	[redacted]	MEN 18+	Men 18+	x26	0.9841		South Atlantic	x53	0.9862	
$75k-$99 9k	x49	[redacted]		35-54	x30	[redacted]		25-49	x29	[redacted]		35-54	x36	[redacted]		2 People	x41	[redacted]	
Home/ Work	x1	[redacted]		$40k- 59 9k	x47	[redacted]		18-24	x27	[redacted]		4 People	x43	[redacted]		Home	x2	[redacted]	
Pacific	x59	0.9846		25-49	x29	0.9611		No Children Present	x39	0.9634		$60k- 74 9k	x48	0.9816	Reach %	Home/ Work	x1	0.9844	
Home	x2	0.9829		$75k-$99 9k	x49	0.9587		25-34	x28	0.9613		Pacific	x59	0.9808		Pacific	x59	0.983	WOMEN 18+
2 People	x41	0.9828		$100k+	x50	0.9511		Children Present	x38	0.9605		Home	x2	0.9798		5+ People	x44	0.9828	
3 People	x42	0.9821	Household Size	1 Person	x40	0.9491	Presence of Child	2 People	x41	0.9542	Household Size	1 Person	x40	0.9798		25-49	x29	0.9827	
25-49	x29	0.9811	WOMEN 18+	Women 18+	x32	0.9483		$60k- 74 9k	x48	0.9493		$75k-$99 9k	x49	0.9787	WOMEN 18+	Women 18+	x32	0.9826	
$100k+	x50	0.9792		South Atlantic	x53	0.9457		55+	x31	0.9472		35-54	x30	0.9784		Middle Atlantic	x52	0.9826	
4 People	x43	0.978		2 People	x41	0.943		$75k-$99 9k	x49	0.9426		$100k+	x50	0.978		$75k-$99 9k	x49	0.9809	
Under $25k	x45	0.9778	Household Income	Under $25k	x45	0.9414		1 Person	x40	0.9412	WOMEN 18+	Women 18+	x32	0.9757		4 People	x43	0.9797	
Women 18+	x32	0.977		Middle Atlantic	x52	0.9385	Household Size	$100k+	x50	0.9399	Household Income	Under $25k	x45	0.9747		$100k+	x50	0.9759	
1 Person	x40	0.9765		25-49	x35	0.9362		Middle Atlantic	x52	0.9378		25-49	x29	0.9739		35-54	x36	0.9754	
35-54	x36	0.9747		35-54	x36	0.9337		Work	x3	0.9373		Work	x3	0.9723	Household Income	Under $25k	x45	0.9734	
25-49	x35	0.9726		5+ People	x44	0.9334		West South Central	x55	0.9183		25-49	x35	0.9685		25-49	x35	0.973	
25-34	x28	0.9689		4 People	x43	0.9281		Home/ Work	y			3 People	x42	0.9643		Work	x5	0.9729	Household Income
Work	x3	0.9656		25-34	x28	0.9139	Visitors (000)	Home/ Work	x6			25-34	x28	0.9621		West South Centr	x55	0.9705	
West South Central	x55	0.9637		West South Centra	x55	0.9137	per Visitor	Home	x7			West South Centr	x55	0.9611		25-34	x28	0.9698	Census Region
55+	x31	0.9634		Work	x3	0.8918		Work	x8			55+	x31	0.9546	Household Size	1 Person	x40	0.9694	
25-34	x34	0.9494	Visitors (000)	Home/ Work	y			Home/ Work	x9			18-24	x27	0.9527		Mountain	x58	0.9658	
18-24	x27	0.9325	per Visitor	Home/ Work	x6		per Visitor in a Da	Home	x10			Teens12-17	x25	0.9329		18-24	x27	0.9597	
Teens12-17	x25	0.9268		Home	x7			Work	x11		Visitors (000)	Home/ Work	y			3 People	x42	0.9573	Presence of Children
Kids 2-11	x24	0.8882		Work	x8			Home/ Work	x12		per Visitor	Home/ Work	x6			25-34	x34	0.9568	
Home/ Work	y		per Visitor in a Day	Home/ Work	x9		per Visitor in a Mo	Home	x13			Home	x7			West North Centra	x57	0.9501	Household Size
Home/ Work	x6			Home	x10			Work	x14			Work	x8			Work	x3	0.9479	
Home	x7			Work	x11			Home/ Work	x15		per Visitor in a Day	Home/ Work	x9			55+	x31	0.9477	
Work	x8		per Visitor in a Month	Home/ Work	x12		Per Unique Page	Home	x16			Home	x10			East North Centra	x56	0.9432	
Home/ Work	x9			Home	x13			Work	x17			Work	x11			18-24	x33	0.9124	
Home	x10			Work	x14			Home/ Work	x18		per Visitor in a Month	Home/ Work	x12			Kids 2-11	x24	0.8979	
Work	x11		Per Unique Page	Home/ Work	x15		Per Usage Day	Home	x19			Home	x13			Teens12-17	x25	0.8867	Visitors (000)
Home/ Work	x12			Home	x16			Work	x20			Work	x14		Visitors (000)	Home/ Work	y		per Visitor
Home	x13			Work	x17			Home/ Work	x21		Per Unique Page	Home/ Work	x15		per Visitor	Home/ Work	x6		
Work	x14		Per Usage Day	Home/ Work	x18		Per Usage Month	Home	x22			Home	x16			Home	x7		
Home/ Work	x15			Home	x19			Work	x23			Work	x17			Work	x8		per Visitor in a Day
Home	x16			Work	x20			Kids 2-11	x24		Per Usage Day	Home/ Work	x18		per Visitor in a Day	Home/ Work	x9		
Work	x17		Per Usage Month	Home/ Work	x21			Teens12-17	x25			Home	x19			Home	x10		
Home/ Work	x18			Home	x22			18-24	x33			Work	x20			Work	x11		per Visitor in a Month
Home	x19			Work	x23			55+	x37		Per Usage Month	Home/ Work	x21		per Visitor in a Mon	Home/ Work	x12		
Work	x20			Kids 2-11	x24			3 People	x42			Home	x22			Home	x13		
Home/ Work	x21			Teens12-17	x25			4 People	x43			Work	x23			Work	x14		Per Unique Page
Home	x22			18-24	x27			5+ People	x44			Kids 2-11	x24		Per Unique Page	Home/ Work	x15		
Work	x23			55+	x31			Under $25k	x45			18-24	x33			Home	x16		
18-24	x33			18-24	x33		Household Incom	$25k- 39 9k	x46			25-34	x34			Work	x17		Per Usage Day
55+	x37			25-34	x34			$40k- 59 9k	x47			55+	x37		Per Usage Day	Home/ Work	x18		
New England	x51			55+	x37			New England	x51		Census Region	New England	x51			Home	x19		
Middle Atlantic	x52			3 People	x42		Census Region	South Atlantic	x53			Middle Atlantic	x52			Work	x20		Per Usage Month
South Atlantic	x53		Census Region	New England	x51			East South Central	x54			South Atlantic	x53		Per Usage Month	Home/ Work	x21		
East South Central	x54			East South Centra	x54			East North Central	x56			East South Centra	x54			Home	x22		
East North Central	x56			East North Centra	x56			West North Central	x57			East North Centra	x56			Work	x23		
West North Central	x57			West North Centra	x57			Mountain	x58			West North Centra	x57			55+	x37		
Mountain	x58			Mountain	x58			Pacific	x59			Mountain	x58		Census Region	New England	x51		
																East South Centra	x54		

Table X.7.Ranking First Eight Variable Using Potential Data Set by Web Page Category (08/98 to 12/00)

	1	2	3	4	5	6	7	8
	Teens & Young Adult		Search Engines			News & Information &Media		Travel & Dining & Leisure			Women
$25k- 39 9k	x46	0.9892	Presence of Children	Children Present	x38	0.9785	Children Present	x38	0.9785	MEN 18+	Men 18+	0.9863		$25k- 39 9k	x46	0.9788
$40k- 59 9k	x47	[illegible]		No Children Present	x39		No Children Present	x39			No Children Present	[illegible]		$40k- 59 9k	x47	[illegible]
Pacific	x59	[illegible]	MEN 18+	Men 18+	x26	[illegible]	Men 18+	x26	0.9782	Presence of Children	Children Present	0.9805		Pacific	x59	0.9694
$60k- 74 9k	x48	0.9621	WOMEN 18+	Women 18+	x32	0.9712	Home/ Work	x1	0.9659		25-49	0.9738		$60k- 74 9k	x48	0.9693
Home/ Work	x1	0.9612		$75k-$99 9k	x49	0.9662	$40k- 59 9k	x47	0.9596		$60k- 74 9k	0.9733		Home	x2	0.9632
3 People	x42	0.9606	Reach %	Home/ Work	x1	0.9615	2 People	x41	0.9574	WOMEN 18+	Women 18+	0.9709		$75k-$99 9k	x49	0.9578
Men 18+	x26	0.9603		25-49	x35	0.9599	Women 18+	x32	0.9528	Reach %	Home/ Work	0.9690		5+ People	x44	0.9555
South Atlantic	x53	0.9778		$60k- 74 9k	x48	0.9588	$25k- 39 9k	x46	0.9525		35-54	0.9641	Household Income	Under $25k	x45	0.953
Middle Atlantic	x52	0.9764		25-49	x29	0.9581	35-54	x30	0.9519		25-34	0.9592	WOMEN 18+	Women 18+	x32	0.9486
Home	x2	0.9751		35-54	x30	0.9572	Pacific	x59	0.9516		35-54	0.9569		2 People	x41	0.9465
$75k-$99 9k	x49	0.9738		2 People	x41	0.957	Home	x2	0.9502		25-49	0.9557		3 People	x42	0.9462
Women 18+	x32	0.9729		5+ People	x44	0.9482	$60k- 74 9k	x48	0.9492		Home	0.9530	Household Size	1 Person	x40	0.9432
25-49	x29	0.9718		35-54	x36	0.9477	5+ People	x44	0.9488		2 People	0.9525		35-54	x36	0.9379
35-54	x30	0.9705		25-34	x34	0.9453	$75k-$99 9k	x49	0.9455		$40k- 59 9k	0.9387		$100k+	x50	0.9378
4 People	x43	0.9676		Home	x2	0.9443	25-49	x35	0.9448		4 People	0.9331		25-49	x35	0.9372
West South Central	x55	0.965		$25k- 39 9k	x46	0.9411	35-54	x36	0.9445		Middle Atlantic	0.9316		Middle Atlantic	x52	0.9343
$100k+	x50	0.9646		Pacific	x59	0.939	25-49	x29	0.9408		South Atlantic	0.9291		4 People	x43	0.9296
25-49	x35	0.9638		$100k+	x50	0.9383	Middle Atlantic	x52	0.9343	Household Size	1 Person	0.9232		25-34	x34	0.9148
35-54	x36	0.9601	Household Size	1 Person	x40	0.9358	4 People	x43	0.9262		$25k- 39 9k	0.9224	MEN 18+	Men 18+	x26	0.9078
5+ People	x44	0.9601		4 People	x43	0.9358	25-34	x28	0.9226		5+ People	0.9217		West South Central	x55	0.9029
East North Central	x56	0.9586		25-34	x28	0.9305	1 Person	x40	0.9159		$75k-$99 9k	0.9201		Work	x3	0.8996
2 People	x41	0.9549		Work	x5	0.8858	25-34	x34	0.8988		25-34	0.9116		35-54	x30	0.8897
Under $25k	x45	0.9533		Mountain	x58	0.8567	3 People	x42	0.8961		55+	0.8844		25-49	x29	0.879
25-34	x28	0.9526		18-24	x27	0.8523	$100k+	x50	0.8917	Visitors (000)	Work	0.8645		55+	x31	0.8762
New England	x51	0.9495		Work	x3	0.8367	55+	x31	0.8885		Work	0.8284		South Atlantic	x53	0.8578
Work	x5	0.9485	Visitors (000)	Home/ Work	y		Work	x5	0.8863		18-24	0.8139		25-34	x28	0.8329
No Children Present	x39	0.9438	per Visitor	Home/ Work	x6		Work	x3	0.8346	Visitors (000)	Home/ Work		Visitors (000)	Home/ Work	y	
West North Central	x57	0.9406		Home	x7		18-24	x27	0.8321	per Visitor	Home/ Work		per Visitor	Home/ Work	x6	
Children Present	x38	0.9398		Work	x8		Mountain	x58	0.8309		Home			Home	x7	
25-34	x34	0.9354	per Visitor in a Day	Home/ Work	x9		18-24	x33	0.7217		Work			Work	x8	
1 Person	x40	0.9341		Home	x10		Home/ Work	y		per Visitor in a Day	Home/ Work		per Visitor in a Day	Home/ Work	x9	
55+	x31	0.923		Work	x11		Home/ Work	x6			Home			Home	x10	
Work	x3	0.922	per Visitor in a Month	Home/ Work	x12		Home	x7			Work			Work	x11	
18-24	x27	0.9037		Home	x13		Work	x8		per Visitor in a Month	Home/ Work		per Visitor in a Month	Home/ Work	x12	
18-24	x33	0.8042		Work	x14		Home/ Work	x9			Home			Home	x13	
Teens12-17	x25	0.7264	Per Unique Page	Home/ Work	x15		Home	x10			Work			Work	x14	
Home/ Work	y			Home	x16		Work	x11		Per Unique Page	Home/ Work		Per Unique Page	Home/ Work	x15	
Home/ Work	x6			Work	x17		Home/ Work	x12			Home			Home	x16	
Home	x7		Per Usage Day	Home/ Work	x18		Home	x13			Work			Work	x17	
Work	x8			Home	x19		Work	x14		Per Usage Day	Home/ Work		Per Usage Day	Home/ Work	x18	
Home/ Work	x9			Work	x20		Home/ Work	x15			Home			Home	x19	
Home	x10		Per Usage Month	Home/ Work	x21		Home	x16			Work			Work	x20	
Work	x11			Home	x22		Work	x17		Per Usage Month	Home/ Work		Per Usage Month	Home/ Work	x21	
Home/ Work	x12			Work	x23		Home/ Work	x18			Home			Home	x22	
Home	x13			Kids 2-11	x24		Home	x19			Work			Work	x23	
Work	x14			Teens12-17	x25		Work	x20						Kids 2-11	x24	
Home/ Work	x15			55+	x31		Home/ Work	x21						Teens12-17	x25	
Home	x16			18-24	x33		Home	x22						18-24	x27	
Work	x17			55+	x37		Work	x23						18-24	x33	
Home/ Work	x18			3 People	x42		Kids 2-11	x24			Kids 2-11			55+	x37	
Home	x19		Household Income	Under $25k	x45		Teens12-17	x25			Teens12-17		Presence of Children	Children Present	x38	
Work	x20			$40k- 59 9k	x47		55+	x37			18-24			No Children Present	x39	
Home/ Work	x21		Census Region	New England	x51		Under $25k	x45			55+		Census Region	New England	x51	
Home	x22			Middle Atlantic	x52		New England	x51			3 People			East South Central	x54	
Work	x23			South Atlantic	x53		South Atlantic	x53		Household Income	Under $25k			East North Central	x56	
Kids 2-11	x24			East South Central	x54		East South Central	x54			$100k+			West North Central	x57	
55+	x37			West South Central	x55		West South Central	x55		Census Region	New England			Mountain	x58	
East South Central	x54			East North Central	x56		East North Central	x56			East South Central					
Mountain	x58			West North Central	x57		West North Central	x57			West South Central					

Table X.8.Ranking First Eight Variable Using Actual Data Set by Web-Page Category (08/98 to 12/00)

			1	2	3	4	5	6	7	8	
14 Web-Site Category Result Using Actual Data						Arts& Entertainment&Music&Sports				Automotive	
UNIQUE VISITOR	Home/Work	y	REACH FREQUE	Home/Work	x1	0.983	REACH FREQUENC	Home/Work	x1	0.9755	REACH FREQUENC
REACH FREQUENCY	Home/Work	x1		No Children Present	x21			18-24	x15		REACH FREQUENC
REACH FREQUENCY	Home	x2		Children Present	x20		REACH FREQUENC	Home	x2	**0.9513**	
REACH FREQUENCY	Work	x3	REACH FREQUE	Home	x2	**0.977**		25-49	x11	**0.9129**	
UNIQUE VISITOR	Home	x4		5+People	x26	**0.9751**		Women 18+	x14	**0.9121**	
UNIQUE VISITOR	Work	x5		25-49	x17	**0.9723**		25-49	x17	**0.9083**	
	Kids 2-11	x6		$25k-39.9k	x28	**0.9714**		Men 18+	x8	**0.893**	
	Teens12-17	x7		Women 18+	x14	**0.9688**		35-54	x18	**0.8821**	
	Men 18+	x8		Men 18+	x8	**0.9659**	REACH FREQUENC	Work	x3	**0.8717**	
	18-24	x9		Pacific	x41	**0.9634**		1Person	x22	**0.8717**	
	25-34	x10		$40k-59.9k	x29	**0.9605**		West South Central	x37	**0.84024**	
	25-49	x11		$60k-74.9k	x30	**0.9576**		5+People	x26	**0.8266**	
	35-54	x12		2People	x23	**0.9571**		Children Present	x20	**0.8259**	
	55+	x13		35-54	x12	**0.954**		No Children Present	x21	**0.8194**	
	Women 18+	x14		3 People	x24	**0.9538**		25-34	x10	**0.8139**	REACH FREQUENC
	18-24	x15		35-54	x18	**0.9524**		$75k-$99.9k	x31	**0.8049**	
	25-34	x16		Under $25k	x27	**0.9516**		35-54	x12	**0.7974**	
	25-49	x17	UNIQUE VISITOR	Work	x5	**0.9509**		$100k+	x32	**0.784**	
	35-54	x18		25-49	x11	**0.9492**		Pacific	x41	**0.782**	
	55+	x19		$75k-$99.9k	x31	**0.9487**		$40k- 59.9k	x29	**0.7809**	
	Children Present	x20		$100k+	x32	**0.9475**		South Atlantic	x35	**0.7783**	
	No Children Present	x21		4 People	x25	**0.9354**		3 People	x24	**0.7558**	
	1Person	x22		25-34	x16	**0.9286**		$25k- 39.9k	x28	**0.7522**	
	2People	x23	REACH FREQUE	Work	x3	**0.9137**		Under $25k	x27	**0.7352**	
	3People	x24		1 Person	x22	**0.9124**		25-34	x16	**0.7261**	
	4People	x25		55+	x13	**0.9049**		$60k- 74.9k	x30	**0.709**	
	5+People	x26		18-24	x9	**0.8928**		4 People	x25	**0.7044**	
	Under$25k	x27		25-34	x10	**0.8928**		55+	x19	**0.6635**	
	$25k-39.9k	x28		Middle Atlantic	x34	**0.8906**		2 People	x23	**0.6543**	
	$40k-59.9k	x29		South Atlantic	x35	**0.8859**		18-24	x9	**0.5703**	
	$60k-74.9k	x30		Teens12-17	x7	**0.8598**		55+	x13	**0.5608**	
	$75k-$99.9k	x31		Kids 2-11	x6	**0.8412**		Mountain	x40	**0.5458**	
	$100k+	x32		55+	x19	**0.8412**		Teens12-17	x7	**0.5392**	
	New England	x33		Mountain	x40	**0.8399**		Middle Atlantic	x34	**0.5189**	
	Middle Atlantic	x34		18-24	x15	**0.7329**		Kids 2-11	x6	**0.4955**	
	South Atlantic	x35		East North Central	x38	**0.7081**		East North Central	x38	**0.3818**	
	East South Central	x36		West South Central	x37	**0.6753**		East South Central	x36	**0.2574**	
	West South Central	x37		New England	x33	**0.6192**		New England	x33	**0.2257**	
	East North Central	x38		West North Central	x39	**0.6071**		West North Central	x39	**0.2213**	
	West North Central	x39		East South Central	x36	**0.4317**	UNIQUE VISITOR	Home/Work	y		UNIQUE VISITOR
	Mountain	x40									
	Pacific	x41									

cont.... Table X.8. Ranking First Eight Variable Using Actual Data Set by Web-Page Category (08/98 to 12/00)

	1	2	3	4	5	6	7	8				
		Business & Finance				Computer& Tech.& Internet				Family Health				Games&Gaming& Hobby	
Home/Work	x1	0.989	REACH FREQU	Home/ Work	x1	0.9772	REACH FREQU	Home/Work	x1	0.9761		Men 18+	x8	0.9748	
Home	x2		REACH FREQU	Home	x2			No Children Presen	x21		REACH FREQUEN	Home/Work	x1		
Women 18+	x14			5+ People	x26			Men 18+	x8		REACH FREQUEN	Home	x2	0.964	
Men 18+	x8	0.9736		Women 18+	x14	0.97		Children Present	x20	0.9646		25-49	x11	0.9629	
35-54	x18	0.9716		25-49	x17	0.9688	REACH FREQU	Home	x2	0.9641		35-54	x12	0.96	REACH FREQUE
No Children Present	x21			Men 18+	x8			Women 18+	x14	0.953		$60k- 74.9k	x30	0.9521	REACH FREQUE
25-49	x17	0.969		35-54	x18	0.9615		5+People	x26	0.9619		Women 18+	x14	0.9429	
Children Present	x20	0.9681		$25k- 39.9k	x28	0.9609	UNIQUE VISITO	Work	x5	0.9496		$25k- 39.9k	x28	0.942	
25-49	x11	0.9667		Children Present	x20	0.9586		25-49	x11	0.9461		$75k-$99.9k	x31	0.9393	
5+ People	x26	0.9609		No Children Prese	x21	0.9539		$25k- 39.9k	x28	0.9422		Pacific	x41	0.9374	
Pacific	x41	0.9593		$75k-$99.9k	x31	0.953		$40k- 59.9k	x29	0.9419		5+ People	x26	0.9373	
35-54	x12	0.9536		$60k- 74.9k	x30	0.9526		Pacific	x41	0.9407		Under $25k	x27	0.9363	
$40k- 59.9k	x29	0.95243		$100k+	x32	0.9506		35-54	x12	0.9401		3 People	x24	0.9304	
$25k- 39.9k	x28	0.9518		3 People	x24	0.9478		$60k- 74.9k	x30	0.9299		West South Centr	x37	0.9249	
Work	x3	0.9501		25-49	x11	0.9468		2 People	x23	0.9285		35-54	x18	0.9232	
2 People	x23	0.9483	UNIQUE VISITO	Work	x5	0.9452		Under $25k	x27	0.9254	UNIQUE VISITOR	Work	x5	0.9226	
Under $25k	x27	0.9382		$40k- 59.9k	x29	0.944		$75k-$99.9k	x31	0.9251		25-49	x17	0.9218	
25-34	x10	0.9337		Under $25k	x27	0.9439		25-49	x17	0.9215		$40k- 59.9k	x29	0.9107	UNIQUE VISITO
$75k-$99.9k	x31	0.9324		Pacific	x41	0.937		South Atlantic	x35	0.9198		No Children Prese	x21	0.9006	
3 People	x24	0.9274		2 People	x23	0.9345		4 People	x25	0.9075		$100k+	x32	0.8973	REACH FREQUE
$60k- 74.9k	x30	0.9236		35-54	x12	0.9334		$100k+	x32	0.8962		Children Present	x20	0.893	
West South Central	x37	0.9164		South Atlantic	x35	0.9208		West South Central	x37	0.8929		2 People	x23	0.8911	
4 People	x25	0.9043		25-34	x10	0.9133	REACH FREQU	Work	x3	0.8928	REACH FREQUEN	Work	x3	0.8846	
$100k+	x32	0.9034	REACH FREQU	Work	x3	0.9027		35-54	x18	0.8881		25-34	x10	0.8764	
55+	x19	0.9015		25-34	x16	0.9014		3 People	x24	0.8807		4 People	x25	0.8537	
25-34	x16	0.889		Middle Atlantic	x34	0.8983		25-34	x10	0.8746		25-34	x16	0.8264	
18-24	x9	0.8762		1 Person	x22	0.8936		25-34	x16	0.8501		55+	x13	0.8158	
Middle Atlantic	x34	0.8753		4 People	x25	0.8857		1 Person	x22	0.8492		1 Person	x22	0.8137	
South Atlantic	x35	0.8733		55+	x13	0.8842		Middle Atlantic	x34	0.8283		Middle Atlantic	x34	0.7962	
1 Person	x22	0.8616		Mountain	x40	0.8272		East North Central	x38	0.8211		55+	x19	0.7321	
Mountain	x40	0.826		55+	x19	0.8234		Mountain	x40	0.8104		18-24	x15	0.72593	
55+	x13	0.7867		Teens12-17	x7	0.8211		Teens12-17	x7	0.8101		18-24	x9	0.7056	
Kids 2-11	x6	0.7601		18-24	x9	0.8012		18-24	x9	0.8067		Teens12-17	x7	0.7015	
18-24	x15	0.7494		West South Centr	x37	0.7786		Kids 2-11	x6	0.7931		Mountain	x40	0.6704	
Teens12-17	x7	0.7273		East North Centra	x38	0.7671		55+	x13	0.7626		Kids 2-11	x6	0.6225	
New England	x33	0.6689		18-24	x15	0.7267		West North Central	x39	0.6642		South Atlantic	x35	0.6097	
West North Central	x39	0.6388		New England	x33	0.6975		55+	x19	0.6467		East North Centra	x38	0.3219	
East North Central	x38	0.6009		Kids 2-11	x6	0.6912		New England	x33	0.6172		New England	x33	0.2636	
East South Central	x36	0.3199		West North Centra	x39	0.6401		18-24	x15	0.5945		West North Centra	x39	0.2033	
Home/ Work	y			East South Centra	x36	0.4481		East South Central	x36	0.5882		East South Centra	x36	0.1205	

cont...Table X.8.Ranking First Eight Variable Using Actual Data Set by Web-Page Category (08/98 to 12/00)

	1			2		3			4			5			6			7			8		
		ISP/Portal				News & Information &Media												Reference & Education & Learning					
Women 18+	x14	0.9888	REACH FREQU	Home/Work	x1	0.9841	REACH FRE	Home/Work	x1	0.9637	REACH FREC	Home/Work	x1	0.9715	REACH FREC	Home/Work	x1						
25-49	x17		REACH FREQU	Home	x2		REACH FRE	Home	x2			Men 18+	x8		REACH FREC	Home	x2						
35-54	x18			Men 18+	x8			No Children	x21			Women 18+	x14	0.9488		Men 18+	x8						
Men 18+	x8	0.979		Women 18+	x14	0.9042		Children Pre	x20	0.916		25-49	x11	0.9475		Pacific	x41						
Home	x2	0.97		25-49	x17	0.9034		Women 18+	x14	0.9158	REACH FREC	Home	x2	0.9463		$25k- 39 9k	x28						
Home/Work	x1	0.967		Pacific	x41	0.9001		Men 18+	x8	0.9022		25-49	x17	0.9415		Women 18+	x14						
25-34	x16	0.9579		No Children	x21	0.8956		35-54	x12	0.8784		35-54	x12	0.9195		25-49	x11						
5+People	x26	0.9434	REACH FREQU	Work	x3	0.8936		$60k- 74.9k	x30	0.8655		5+ People	x26	0.9141		$60k- 74 9k	x30						
35-54	x12	0.9419		Children Pre	x20	0.8895		25-49	x11	0.8624		$100k+	x32	0.9139		Under $25k	x27						
$60k-74.9k	x30	0.93		$75k-$99.9k	x31	0.8854		5+ People	x26	0.8622		Kids 2-11	x6	0.9055	REACH FREC	Work	x3						
18-24	x9	0.9283		35-54	x12	0.8851	REACH FRE	Work	x3	0.8605		35-54	x18	0.9021		35-54	x12						
25-49	x11	0.9246		25-49	x11	0.8813		25-49	x17	0.8507		3 People	x24	0.8935		25-34	x10						
3 People	x24	0.9244		5+ People	x26	0.8805		$75k-$99.9k	x31	0.8492		$60k- 74.9k	x30	0.8917		$100k+	x32						
$75k-$99.9k	x31	0.9242		35-54	x18	0.8792		4 People	x25	0.8448		25-34	x16	0.8662		5+ People	x26						
55+	x13	0.9234		$25k- 39.9k	x28	0.87		1 Person	x22	0.8429	REACH FREC	Work	x3	0.8564		$40k- 59 9k	x29						
$100k+	x32	0.9133		2 People	x23	0.8483		Under $25k	x27	0.8384		$75k-$99.9k	x31	0.8507		$75k-$99 9k	x31						
Under $25k	x27	0.9102		$60k- 74.9k	x30	0.8361		Teens12-17	x7	0.8305		Pacific	x41	0.843		No Children Pres	x21						
Work	x5	0.8787		$100k+	x32	0.8357		2 People	x23	0.8236		$25k- 39 9k	x28	0.8368		Children Present	x20						
Teens12-17	x7	0.8769		Under $25k	x27	0.8329		$100k+	x32	0.8234		25-34	x10	0.8315		25-49	x17						
Work	x3	0.8657		$40k- 59.9k	x29	0.8137		South Atlanti	x35	0.811		55+	x13	0.8253		2 People	x23						
$25k- 39.9k	x28	0.8623		25-34	x16	0.8092		35-54	x18	0.8082		Under $25k	x27	0.8232		35-54	x18						
25-34	x10	0.86		25-34	x10	0.7977		Pacific	x41	0.8074		Children Prese	x20	0.8134		Middle Atlantic	x34						
Middle Atlantic	x34	0.857		3 People	x24	0.792		East North C	x38	0.7965		No Children Pr	x21	0.8067		1 Person	x22						
55+	x19	0.8569		4 People	x25	0.7839		$25k- 39.9k	x28	0.786		Middle Atlantic	x34	0.772		4 People	x25						
Mountain	x40	0.8104		1 Person	x22	0.7444		3 People	x24	0.7751		South Atlantic	x35	0.7695		25-34	x16						
Children Present	x20	0.8066		55+	x19	0.7311		Middle Atlan	x34	0.7731		4 People	x25	0.7583		3 People	x24						
$40k- 59.9k	x29	0.8053		Middle Atlan	x34	0.7105		25-34	x10	0.7606		$40k- 59.9k	x29	0.7424		South Atlantic	x35						
No Children Prese	x21	0.8013		South Atlanti	x35	0.6987		West South	x37	0.7198		2 People	x23	0.7341		55+	x13						
18-24	x15	0.8007		55+	x13	0.6892		55+	x13	0.7178		55+	x19	0.727		Mountain	x40						
South Atlantic	x35	0.7598		18-24	x9	0.6841		25-34	x16	0.6832		Mountain	x40	0.7043		18-24	x9						
Kids 2-11	x6	0.7423		Teens12-17	x7	0.6483		Mountain	x40	0.6655		18-24	x9	0.6484		West South Cen	x37						
West South Centra	x37	0.7282		West South	x37	0.5836		18-24	x9	0.615		Teens12-17	x7	0.6195		55+	x19						
1 Person	x22	0.7257		Mountain	x40	0.4912		55+	x19	0.5011		1 Person	x22	0.5734		Teens12-17	x7						
2 People	x23	0.7049		Kids 2-11	x6	0.4498		18-24	x15	0.4926		East North Cen	x38	0.5385		East North Cent	x38						
Pacific	x41	0.6787		East North C	x38	0.3803		Kids 2-11	x6	0.4827		18-24	x15	0.5064		18-24	x15						
4 People	x25	0.6513		18-24	x15	0.3324		New England	x33	0.4652		New England	x33	0.5014		West North Cen	x39						
New England	x33	0.4156		West North C	x39	0.2894		West North C	x39	0.3902		West North Ce	x39	0.452		New England	x33						
East North Central	x38	0.4033		New England	x33	0.279		East South C	x36	0.3815	UNIQUE VISI	Work	x5	0.434		Kids 2-11	x6						
West North Centra	x39	0.3981		East South C	x36	0.2656		$40k- 59.9k	x29	0.242		East South Cer	x36	0.2696		East South Cent	x36						
East South Centra	x36	0.3232	UNIQUE VISITC	Home/ Wor	y		UNIQUE VIS	Home/ Wor	y		UNIQUE VISI	Home/ Work	y		UNIQUE VISI	Home/ Work	y						

Shopping & Ecommerce				Teens & Young Adult				Travel & Dining & Leisure				Women
0 9873	REACH FREQU	Home/Work	x1	0 9797	REACH FREQ	Home/Work	x1	0 9713	REACH FRE	Home/Work	x1	0 973
[redacted]	REACH FREQU	Home	x2	[redacted]		Men 18+	x8	[redacted]	REACH FRE	Home	x2	[redacted]
[redacted]		Men 18+	x8	[redacted]		Women 18+	x14	[redacted]		25-49	x17	[redacted]
0.9628		Women 18+	x14	0.9568	REACH FREQ	Home	x2	0.9418		25-49	x11	0.9416
0.9626		25-49	x11	0.9566		25-49	x11	0.9339		Women 18+	x14	0.9408
0.9606		$40k-□59.9k	x29	0.9497		25-49	x17	0.9053		Pacific	x41	0.9363
0.9605		2□People	x23	0.948		35-54	x12	0.8951		$25k- 39.9k	x28	0.9358
0.9555		$60k-□74.9k	x30	0.9412		25-34	x10	0.8861		35-54	x18	0.9297
0.9533		4□People	x25	0.9397		35-54	x18	0.8694		Men 18+	x8	0.9256
0.9523		35-54	x12	0.9387		$60k-□74.9k	x30	0.869		35-54	x12	0.9215
0.9472		Under□$25k	x27	0.9327	REACH FREQ	Work	x3	0.8437		2□People	x23	0.9215
0.947		5+□People	x26	0.9302		$100k+	x32	0.8152		$40k- 59.9k	x29	0.909
0.9469		$25k-□39.9k	x28	0.9292		$75k-$99.9k	x31	0.8086		5+□People	x26	0.9037
0.9433		25-49	x17	0.9279		5+□People	x26	0.8031		3 People	x24	0.8969
0.9409		Pacific	x41	0.916		25-34	x16	0.7986		$75k-$99.9k	x31	0.8969
0.9389		35-54	x18	0.9121		$25k- 39.9k	x28	0.7811		Under □$25k	x27	0.8866
0.9376		$75k-$99.9k	x31	0.9027		Middle Atlantic	x34	0.7802		$60k- 74.9k	x30	0.8773
0.9368		$100k+	x32	0.9023		3□People	x24	0.7745		25-34	x16	0.8712
0.9362		3□People	x24	0.9012		Pacific	x41	0.7662		25-34	x10	0.8659
0.93		West South Centra	x37	0.8967		West South Centra	x37	0.7553	REACH FRE	Work	x3	0.8623
0.9295		25-34	x10	0.8891		South Atlantic	x35	0.745		$100k+	x32	0.8538
0.9202		1□Person	x22	0.8838		Under□$25k	x27	0.7393		Kids 2-11	x6	0.8428
0.9088	REACH FREQU	Work	x3	0.8808		55+	x13	0.733		4 □People	x25	0.8105
0.9024		Middle Atlantic	x34	0.8414		$40k-□59.9k	x29	0.6973		55+	x13	0.7987
0.8875		No Children Preser	x21	0.8397		No Children Preser	x21	0.6919		1 □Person	x22	0.774
0.8859		18-24	x9	0.8274		Children Present	x20	0.6907		Middle Atlantic	x34	0.7646
0.8787		25-34	x16	0.8197		4□People	x25	0.6838		55+	x19	0.7222
0.8751		Children Present	x20	0.81		2□People	x23	0.6614		18-24	x9	0.6451
0.8664		South Atlantic	x35	0.8018		18-24	x9	0.6569		South Atlantic	x35	0.6196
0.8622		Mountain	x40	0.7868		Mountain	x40	0.6407		Mountain	x40	0.5852
0.8161		55+	x13	0.7711		55+	x19	0.6284		18-24	x15	0.4582
0.7863		55+	x19	0.6957		1□Person	x22	0.5784		No Children Prese	x21	0.3698
0.7307		18-24	x15	0.6122		East North Central	x38	0.4962		Children Present	x20	0.3619
0.7266		West North Centra	x39	0.6054		18-24	x15	0.4906		East North Centra	x38	0.2667
0.7062		Teens12-17	x7	0.6049		New England	x33	0.4775		West North Centr	x39	0.2612
0.6899		New England	x33	0.5582		Teens12-17	x7	0.4342		Teens12-17	x7	0.2413
0.6553		East North Central	x38	0.5149		West North Central	x39	0.3606		New England	x33	0.1354
0.6205		East South Central	x36	0.4164		Kids 2-11	x6	0.3106		East South Centra	x36	0.1068
0.4367		Kids 2-11	x6	0.3005		East South Central	x36	0.2708	UNIQUE VIS	Home/□Work	y	
	UNIQUE VISITO	Home/□Work	y		UNIQUE VISI	Home/□Work	y			West South Centr	x37	

Table X.9. For Leading Group First Highest Eight Variable From Each Data Category

All DomainName Leading Group Selection	Web-Pages Category Leading Group Selection	Ranking Final Leading Group selection
Home Females18+, Household Size, 5+persons, NoChildren Household Income($25K-$39,999K) Pacific Region YesChildren Household Income(,<$25K)	Males18+ Home-Work Home Females18+, Household Income($60K-$75K) NoChildren YesChildren Household Income($25K-$39,999K)	Home, Females18+, Males18+ NoChildren Household Size, 5+persons, YesChildren Household Income($25K-$39,999) Pacific Region

Table X.10. First Three Highest Leading Characteristic Base on Variable Category

Variable Category	First Highest Leading Characteristics	Second Highest Leading Characteristics	Third Highest Leading Characteristics
Males	Age (18+)	Age (25-49)	Age (35-54)
Females	Age (18+)	Age (25-49)	Age (Age (35-54)
Household Size	5+People	2 people	-
Household Income	$25K-$40K	$25K	$40K-$60K
Region	Pasific	Sought Atlantic	Mid-Atlantic

Table X.11.SUMMARY OUTPUT FOR LEADING INDEX REGRESSION (Equation # 3)

Y= -21829+1.38*(Men18+) + 1.86*(5+People) +0.53*(F25-49)+0.33(YesChildrenPresent)
(6.62) (6.32) (2.49) (1.23)

Regression	
Multiple R	0.99536827
R Square	**0.99075799**
Adjusted R Square	0.98921765
Standard Error	796.401466
Observations	29

ANOVA

Regression	4	1631835525	407958881	643.20926	5.00519E-24
Residual	24	15222127.1	634255.3		
Total	28	1647057652			

Intercept	-21829.163	3020.858025	**-7.226147**	1.819E-07	-28063.9063	-15594.42
Men 18+	1.38245526	0.208587718	**6.6276925**	7.436E-07	0.95195146	1.8129591
5+People	1.86843556	0.295343304	**6.3263177**	1.536E-06	1.258877062	2.4779941
25-49	0.53261071	0.213759762	**2.4916322**	0.0200235	0.091432336	0.9737891
Children Present	0.33073202	0.267451044	**1.2366077**	0.2281979	-0.221259692	0.8827237

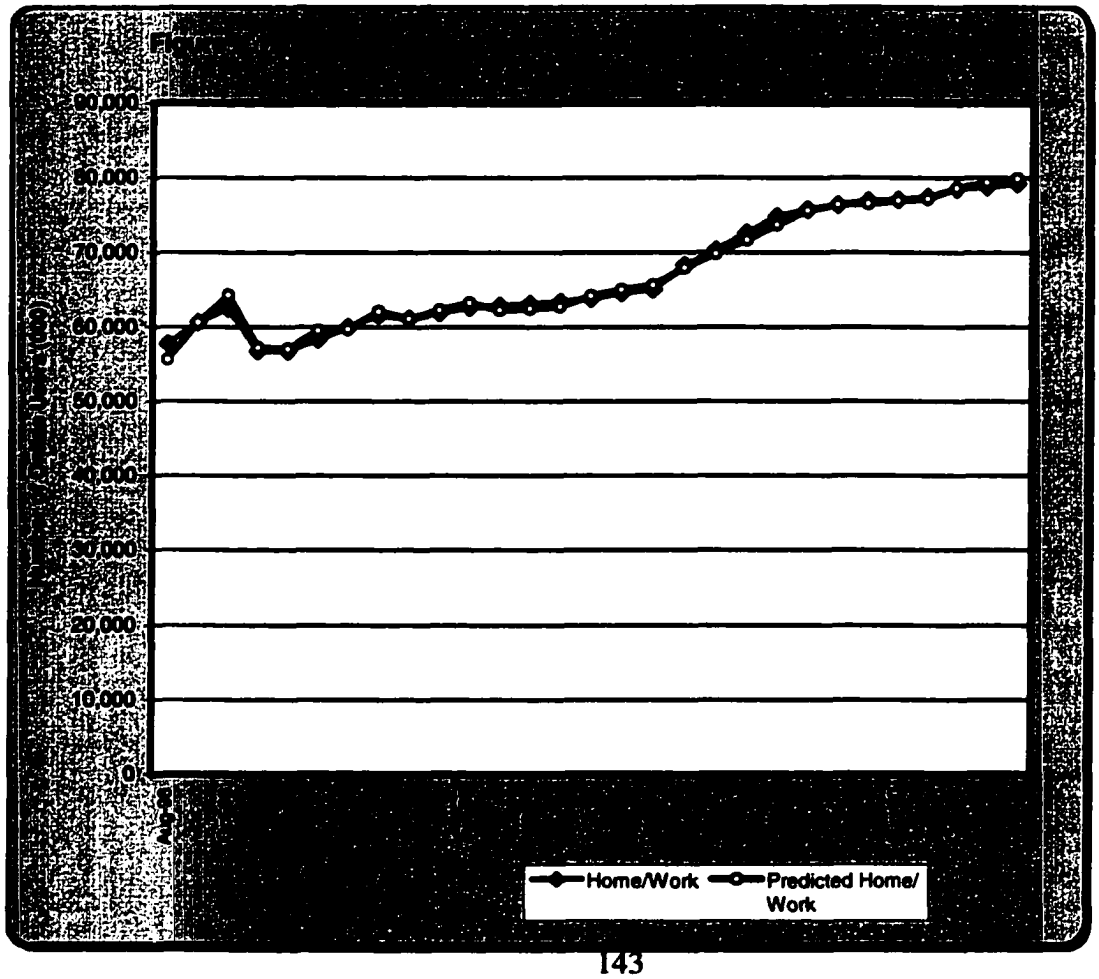


Table X.12.SUMMARY OUTPUT FOR LEADING INDEX REGRESSION (Equation #4)

$$Y = 9328 + 0.68*(\text{Women18+}) + 0.03*(\text{Pacific}) + 1.31*(\text{NoChildren}) + e \quad (4)$$
$$(4.45) \qquad (0.37) \qquad (11.46)$$

Multiple R	0.99
R Square	**0.99**
Adjusted R Square	0.99
Standard Error	878.43
Observations	29.00

ANOVA

Regression	3	1627766790.065	542588930.02	703.17	0.00
Residual	25	19290862.099	771634.48		
Total	28	1647057652.165			

Intercept	9328.31	1730.09	5.39	0.00	5765.12	12891.49	5765.12	12891.49
Women 18+	0.68	0.15	4.45	0.00	0.37	1.00	0.37	1.00
Pacific	0.04	0.10	0.38	0.71	-0.17	0.25	-0.17	0.25
No Children Present	1.32	0.11	11.46	0.00	1.08	1.55	1.08	1.55

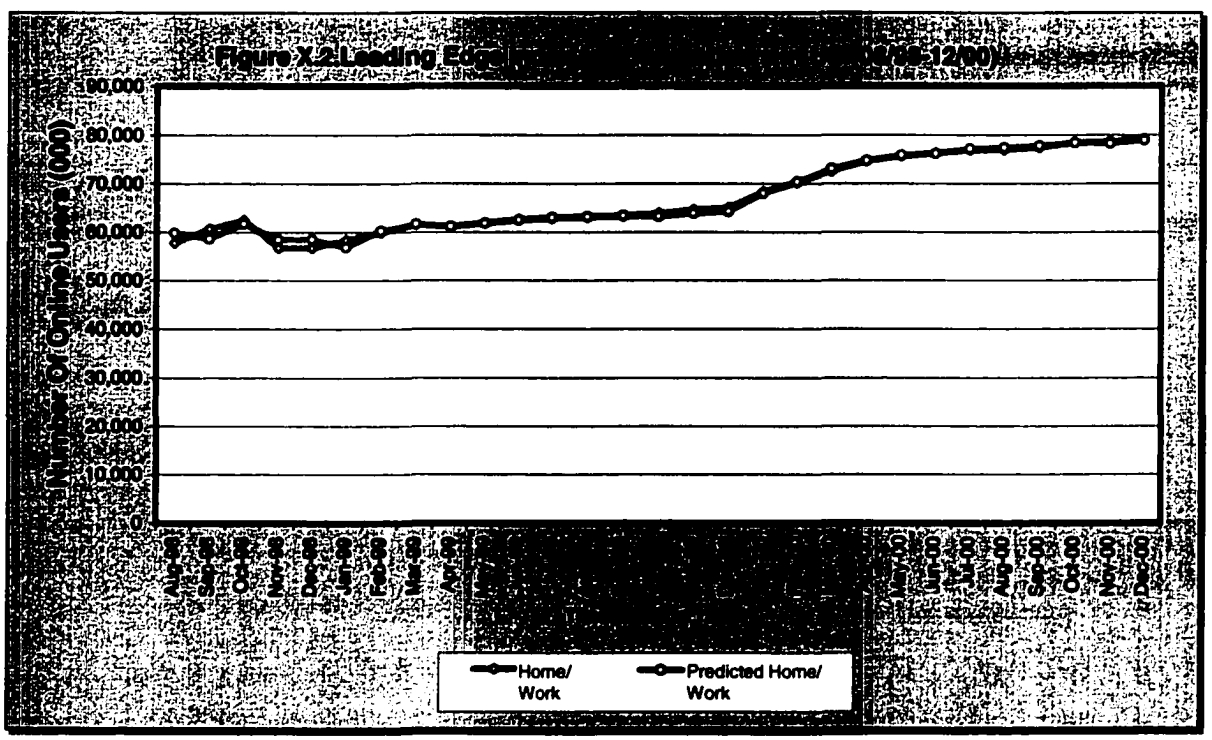


Table X.13. Online Web Ad Spending

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

Table X.14.Global Online Ad Spending, 1999-2005 US Dollars (in millions)

	1999	2000	2001	2002	2003	2004	2005
North America	3,509	5,390	7,444	9,768	12,237	14,623	16,913
Western Europe	434	906	1,535	2,258	3,118	4,111	5,263
Asia	225	502	880	1,375	1,922	2,556	3,324
Latin America	52	127	240	402	628	888	1,168
Australia/ New Zealand	24	74	135	208	288	373	462
Other	9	28	61	118	211	351	578
Total	**4,253**	**7,027**	**10,296**	**14,129**	**18,402**	**22,903**	**27,708**
Source: Jupiter Communications							

Table X.15.Top Sites by Online Ad Revenue

Site	2001 Revenue
Yahoo	$344,023,858
AOL.com	$319,966,842
Excite	$126,839,443
Lycos	$111,071,976
Netscape	$108,045,556
AltaVista	$77,584,031
WebCrawler	$57,455,361
ESPN.com	$44,115,749
MSN	$33,638,416
Weather.com	$31,813,112
Source: CMRi	

11.3.Bibliography

Christen son, M.C. (1997), "The Innovator's Dilemma: When New Technologies Cause Great Firms to Fail," *Harvard Business School Press.*

Christine, M., and Miner, S. A. (1997), "The Impact of Organizational Memory on New Product Performance and Creativity," *Journal of Marketing Research.*

Christian, L (2000), "Characteristics of innovating users in a consumer goods field: An empirical study of sport-related product consumers," *MIT Sloan School of Management working paper.*

Council of Economic Advisors (2000*), " Economic Report of the President".* www.access.gpo.gov/usbudget/fy2001/erp.html

Cohen, W. M., and Levinthal, D. (1989), "Innovation and Learning: The Two Faces of R&D," *Economic Journal,* Vol. 99, pp. 569-596.

Cunningham, I.C.M., and Cunningham, W.H. (1973), "The Urban In-Home Shopper: Socioeconomic and Attitudinal Characteristics", *Journal Retailing,* Vol.49.Fall.

Department of Commerce, Bureau of Economic Analysis (1999), " Fixed Reproducible Tangible Wealth in the United States, 1925-94." *Washington, D.C: Government Printing Office.*

Dietmar, H., Henkel, J., and von Hippel, E. (2000), "Profiting from voluntary information spillovers: How users benefit by freely revealing their innovations," *MIT Sloan School of Management WP* # 4125.

Doe, John B. (1996),"Conceptual Planning: A Guide to a Better Planet," 3d ed. Reading, MA: *SmithJones.*

Economic Report of the President (1994), Washington, D.C*: Government Printing Office*

Gans, J. S., and Stern, S. (1999), "The Economics of User-Based Innovation," *MIT SSM Working Paper.*

Hand, John R.M. (2000), "The Role of Economic Fundamentals, Web Traffic, and Supply and Demand in the Pricing of U.S. Internet Stocks", *EFA* 0320

Herstatt, C., and von Hippel, E. (1992), "From Experience: Developing New Product Concepts Via the Lead User Method: A Case Study in a "Low Tech" Field", *Journal of Product Innovation Management, 1992;9: 213-221.*

Horney, K. (1958)," Neurosis and Human Growth", New York: Norton.

Kondratiev, N. D. (1935), "The Long Waves in Economic Life" *Review of Economic Statistics,* vol.17.no.6.

Kenney, M., and Curry, J. (1999), "E-Commerce: Implications for Firm Strategy and Industry Configuration." *Industry and Innovation* 6 (2): 131-151.

Lakhani, K., and von Hippel, E. (2000), "Emerging economics of virtual communities:" Free" user-to-user assistance in open source software," *MIT Sloan School of Management, Working paper* # 4117 (May).

Lilien, G., Morrison, P., and von Hippel, E. (2000), "Performance of lead user concept generation methods relative to traditional ones: An empirical study," *MIT Sloan School of Management Working Paper.*

Lüthje, C. (2000), "Characteristics of innovating users," *Technical University of Hamburg-Harburg Working Paper.*

Morrison, P. D., and. Roberts, J. H and von Hippel, E. (2000), "Determinants of User Innovation And Innovation Sharing in a Local Market," *Management Science*, Vol. 46, No 12 (December). 1513-1527.

Nortel Networks, (1999), "1999 Annual Report", Online Document.

Oversights: A Marketing Research Perspective" Technological Innovation: Oversights and Foresights, Garud, Raghu; Nayyar, Praveen Rattan; and Shapira, Zur Baruch, eds., Cambridge University Press, New York.

Gitlin,D.R. (2000), "Next Generation Networks, The New Public Network", Columbia University.

Rotter, J.B. (1966), " Generalized Expectancies for Internal versus External Control of reinforcement", Psychological Monographs: General And Applied, Vol. 80, No.1.

Sonnack, M. (2000), "Creating Your Next Breakthrough, Lead-User Research at 3M, a new approach to anticipate customer needs", *Division Scientist, Corporate Marketing 3M Company.*

Sterberg and Lubart (1991) "An Investment Theory of Creativity and its development". *Human Development*, 34, 1-31.

Smith, C. (1997),"Theory and the Art of Communications Design", *State of the University Press.*

Solow, R.M., (1957). Technological Change and the Aggregate Production Function. *Review of Economics and Statistics*, 39: 312-320.

Von Hippel, E. (1986), "Lead Users: A Source of Novel Product Concepts," *Management Science* 32, 7 (July), 791-805.

--------, E. (1988), "The Sources of Innovation," *New York: Oxford University Press.*

--------, E., Churchill, J. and Sonnack, M. (2000), "Breakthrough Products with Lead User Research, Lead User Concepts" *Press, leaduser.com* (also forthcoming, New York: Oxford University Press).

--------, E., Thomke, S. and Sonnack, M. (1999), "Creating Breakthroughs at 3M", *Harvard Business Review* (September-October), 47-57.

--------, E., and Glen L.,U. (1988) "Lead User Analyses for the Development of New Industrial Products," *Management Science* 34, 5 (May) 569-82.

--------, E., (1976), "The Dominant Role of Users in the Scientific Instrument Innovation Process," *Research Policy*, 5, 212-39.)

--------, E., (1986), "Lead users: A Source of Novel Product Concepts," *Management Science* 32,no.7.

--------, Eric (1987) "Cooperation Between Rivals: Informal Know-How Trading," *Research Policy* 16: 291-302.

Willard,G.C, and Kaufman,N. (1999), "Itanium Enters the High-Performance Computing Universe" *An IDC White Paper.*

Wenger, Etiene (1998)," Communities of Practice: Learning, Meaning and Identity," New York.

11.4.Bibliography (Essay 1and Essay 2)

Baily, M.N. and Lawrence, R.Z., (2001), "Do We Have a New E-conomy?" *American Economic Review Papers and Proceedings*, 91: 308-312. May.

Barro, R., and, Xavier,S.M. (1995), "Economic Growth," *McGrraw-Hill*, New York.

Basu,S., J.Fernald,and M.Shapiro (2001),"Productivity Growth in The 1990s' Technology, Utilization, or adjustment?" *NBER.*

Bureau of Labor Statistics (1999), Online Service.

Christen son, M.C. (1997), "The Innovator's Dilemma: When New Technologies Cause Great Firms to Fail," *Harvard Business School Press.*

Christine, M., and Miner, S. A. (1997), "The Impact of Organizational Memory on New Product Performance and Creativity," Journal of Marketing Research.

Christian, L (2000), "Characteristics of innovating users in a consumer goods field: An empirical study of sport-related product consumers," *MIT Sloan School of Management working paper.*

Council of Economic Advisors (2000*), Economic Report of the President.* www.access.gpo.gov/usbudget/fy2001/erp.html

Cohen, W. M., and Levinthal, D. (1989), "Innovation and Learning: The Two Faces of R&D," *Economic Journal,* Vol. 99, pp. 569-596.

Cunningham, I.C.M., and Cunningham, W.H. (1973), "The Urban In-Home Shopper: Socioeconomic and Attitudinal Characteristics", *Journal Retailing,* Vol.49.Fall.

David Cracknell, Sumit Majumdar and Nimeshh Patel (2000), "What Drives Internet Demand in The UK)," Online Document.

Department of Commerce, Bureau of Economic Analysis (1999),"Fixed Reproducible Tangible Wealth in the United States, 1925-94." *Washington, D.C: Government Printing Office.*

Dietmar, H., Henkel, J., and von Hippel, E. (2000), "Profiting from voluntary information spillovers: How users benefit by freely revealing their innovations" *MIT Sloan School of Management WP* # 4125.

Doe, John B. (1996),"Conceptual Planning: A Guide to a Better Planet," 3d ed. Reading, MA: *SmithJones.*

Everett Rogers (1962,pp. 1-20), The Diffusion of Innovation: New York.

Economic Report of the President, (1994), Washington, and D.C: *Government Printing Office.*

Gans, J. S., and Stern, S. (1999), "The Economics of User-Based Innovation," *MIT SSM Working Paper.*

Gitlin, D.G. (2000), "Next Generation Networks, The New Public Network", *Columbia University, Working Papers.*

Gordon, J.R. (2000), " Does the 'New Economy' Measure up to the Great Inventions of the Past? "Northwestern University; National Bureau of Economic Research (NBER), Center for Economic Policy Research (CEPR), *NBER Working Paper* No. W7833.

Gordon. J. R. (1999), "Organizational Behavior: A diagnostic approach", *Prentice Hall International Inc.*

Gordon, J.R. (2002), "*Technology and Economic Performance in the American Economy*" National Bureau of Economic Research (NBER); Center for Economic Policy Research (CEPR).

Greenwood, J., and, Boyan Jovanovic,B. (1999), "The Information-Technology Revolution and the Stock Market" *at Rochester University.*

Hand, John R.M. (2000), "The Role of Economic Fundamentals, Web Traffic, and Supply and Demand in the Pricing of U.S. Internet Stocks", *EFA 0320.*

Hall, R.E., (1990), "Invariance Properties of Solow's Productivity Residual. Growth/Productivity/Unemployment: Essays to Celebrate Bob Solow's Birthday," *Ed.P.A. Diamond, Cambridge, MA: MIT Press.*

Herstatt, C., and von Hippel, E. (1992), "From Experience: Developing New Product Concepts Via the Lead User Method: A Case Study in a "Low Tech" Field", *Journal of Product Innovation Management*, 1992; 9: 213-221.

Horney, K. (1958)," Neurosis and Human Growth", New York: Norton.

Howe, Walt. 2000,"A Brief History of the Internet," (April 18). http://www0.delphi.com/navnet/faq/history.html

IMF (1999a), *World Economic* Outlook, May 1999, Washington.

Internet Capital Group. 2001. www.icg.com.

Kenney, M., and Curry, J. (1999), "E-Commerce: Implications for Firm Strategy and Industry Configuration." *Industry and Innovation* 6 (2): 131-151.

Kenney, M., and Curry, J. (2000), "Beyond Transaction Costs: E-commerce and the Power of the Internet Data space." *Worlds of E-Commerce: Economic, Geographical and Social Dimensions* (New York: John Wiley & Sons): 45-66.

Kondratiev, N. D. (1935), "The Long Waves in Economic Life" *Review of Economic Statistics,* vol.17.no.6.

Lakhani, K., and von Hippel, E. (2000), "Emerging economics of virtual communities:" Free" user-to-user assistance in open source software," *MIT Sloan School of Management, Working paper* # 4117 (May).

Lilien, G., Morrison, P., and von Hippel, E. (2000), "Performance of lead user concept generation methods relative to traditional ones: An empirical study," *MIT Sloan School of Management Working Paper*.

Lucas, Robert E. Jr. (1988),"On the Mechanics of Economic Development" *Journal Of Economic Development.*

Lüthje, C. (2000), "Characteristics of innovating users," *Technical University of Hamburg-Harburg Working Paper.*

Madden and Savage (1998), Pricing and Internet traffic. Paper presented to 1998 *International Telecommunication Society conference, Stockholm.*

Morrison, P. D., and. Roberts, J. H and von Hippel, E. (2000), "Determinants of User Innovation And Innovation Sharing in a Local Market," *Management Science*, Vol. 46, No 12 (December). 1513-1527.

Nordhaus, W.D., (2000), "Productivity and the New Economy." *Cowles Foundation Discussion Paper* No. 1284. New Haven, CT: Yale University.

Nortel Networks (1999),"1999 Annual Report", Online Document.

Oversights: A Marketing Research Perspective" Technological Innovation: Oversights and Foresights, Garud, Raghu; Nayyar, Praveen Rattan; and Shapira, Zur Baruch, eds., Cambridge University Press, New York.

Oliner, S.D., and Sichel, D.E., (2000), "The Resurgence of Growth in the Late 1990s: Is Information Technology the Story?" *Journal of Economic Perspectives*, 14: 3-22.

Postel,J., Roberts,G.L., and Wolff,S. (2000),"A Brief History of the Internet." http://www.isoc.org/internet-history/brief.html#Initial_Concepts

Richard D. Gitlin, (2000), "Next Generation Networks, The New Public Network", *Columbia University.*

Rotter, J.B. (1966), " Generalized Expectancies for Internal versus External Control of reinforcement", *Psychological Monographs: General And Applied,* Vol. 80, No.1.

Robertson, T.S. (1971) Innovative Behavior and Communication, New York.

Rappoport,K., and Taylor (1998), "An Econometric Study of the Demand for Access to the Internet. At 1998," *International Telecommunications Society conference, Stockholm.*

Romer, P. (1996), "Why, Indeed in America? Theory, History, and the Origins of Modern Economic Growth", *NBER Working Paper* 5443.

Smith, Chris. (1997),"Theory and the Art of Communications Design", *State of the University Press.*

Sonnack, M. (2000),"Creating Your Next Breakthrough, Lead-User Research at 3M, a new approach to anticipate customer needs", *Division Scientist, Corporate Marketing 3M Company.*

Solow, R.M., (1957). Technological Change and the Aggregate Production Function. *Review of Economics and Statistics*, 39: 312-320.

Sterberg and Lubart (1991) "An Investment Theory of Creativity and its development". *Human Development*, 34, 1-31.

US Department of Commerce (1999a), Emerging Digital Economy.

US Department of Commerce (2002),"A Nation Online", *National Telecommunication and Information Administration.*

US Government Working Group on Electronic Commerce (1998)," First Annual Report. The Center for Communication Policy at University California at Los Angeles." The latest survey results were published in November 2001.

US Government Census 2000, Online data service.

VerticalNet. 2001. www.verticalnet.com.

Von Hippel, E. (1986), "Lead Users: A Source of Novel Product Concepts," *Management Science* 32, 7 (July), 791-805.

--------, E. (1988), "The Sources of Innovation," *New York: Oxford University Press.*

--------, E., Churchill, J. and Sonnack, M. (2000), "Breakthrough Products with Lead User Research, Lead User Concepts" *Press, leaduser.com* (also forthcoming, New York: Oxford University Press).

--------, E., Thomke, S. and Sonnack, M. (1999), "Creating Breakthroughs at 3M", *Harvard Business Review* (September-October), 47-57.

--------, E., and Glen L.,U. (1988) "Lead User Analyses for the Development of New Industrial Products," *Management Science* 34, 5 (May) 569-82.

--------, E., (1976), "The Dominant Role of Users in the Scientific Instrument Innovation Process," *Research Policy*, 5, 212-39.)

--------, E., (1986), "Lead users: A Source of Novel Product Concepts," *Management Science* 32,no.7.

Willard,G.C, and Kaufman,N. (1999),"Itanium Enters the High-Performance Computing Universe" *An IDC White Paper.*

Wenger, Etiene (1998)," Communities of Practice: Learning, Meaning and Identity" (New York:)

Zysman,J., and Steven Weber, (2001),"Governance and Politics of the Internet Economy: Historical Transformation or Ordinary Politics with a New Vocabulary? "BRIE Working Paper 141" *Berkeley Roundtable on the International Economy (BRIE)*, University of California, Berkeley.