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The public has long had an ambivalent relationship with technology. Although ingenuity, discovery, and progress are important American values, people also express nostalgia for the "good old days" when life was slower-paced and simpler. And the public's ambivalence toward technology appears to be rising as they are presented with more and more technological advances: Today, twice as many Americans think that over the long term technology has made life better (48%) rather than worse (23%), *but* the number who say life is *worse* has actually risen from just 16% a decade ago.

Why the ambivalence? Uncertainty about the impact of technology undoubtedly has to do with the pace at which consumers feel they can keep up with the changes, complexity, and cost of the latest technological advances. Yet, it may also reflect the fact that technology has already altered American life—for both the better *and* worse. At the same time that technology enriches leisure options—from the VCR to HDTV—it also blurs the lines between leisure and work. "Down time" no longer exists: The lap top beckons us to work at home and on the road; the cellular phone keeps us ever-connected to the home *and* office.

Yet despite such conflicting feelings about technology, there are a number of important trends that suggest that the American people are prepared to embrace the panoply of new technologies for the home and office that are emerging. A pervasive sense of self-reliance among consumers, a growing trend toward home leisure, and an increasingly "info-active" society, among others, are all trends that point to a bright future for the computer and high-tech industries. For the technology industry to capture the public's imagination—and ease their technological ambivalence—it is essential to stay abreast of these and other trends in consumer lifestyles, attitudes, and behaviors—and to understand where they may be headed in the future.

To successfully appeal to consumers in a highly competitive and fast-changing consumer environment, marketers need to understand the underlying issues and trends driving today's technology market. ROPER REPORTS surveys point to several emerging trends in the following categories:

- Consumer Market and Demand
- Leisure Trends and Home Computer Market
- Shopping for a PC—Distribution System, Brands, Service
- Info-Activism And The Self-Reliant Consumer
- Future of Interactivity: How Fast, Who and What?

The following *Industry Insights* provides a detailed look at the current trends in these issue areas, and the potential impact each has on today's technology industry.

I. Consumer Market and Demand

The late 1980s and early 1990s were one of the most fertile periods for technological innovation. Yet, many of the products born during that time were introduced with high price tags while facing a cool consumer climate. As the nation now awakens from a period of economic slumber—and consumers begin to loosen their purse strings—many of these high-tech products have a second chance to arouse consumer interest.

Today's consumer mood is still far from ebullient, but most people are less beleaguered by the "recessionary blues" that they suffered from throughout most of the early 1990s. Likewise, although most consumers are not rushing out to invest in big-ticket items—including high-tech products—Americans' awareness of the latest technologies suggest that pent-up demand for the latest technologies will likely give way to purchases in the latter half of the decade. Moreover, the nation's "technology elite" groups are already leading the way.

Electronics Products: Awareness, Interest, Ownership

	Heard of		Interested in buying		Own	
	1995	1992	1995	1992	1995	1992
	%	%	%	%	%	%
Car telephone	93	82	13	10	9	5
Fax machine	89	79	6	5	6	2
Pager/electronic beeper	85	*	7	*	14	*
Lap-top computer	78	55	10	7	4	3
Pocket cellular telephone	75	43		6	1	
VCR-Plus	70	43	6	4	20	8
Hand-held portable TV/VCR	65	41	4	3	7	3
Video phone	64	41	6	4	*	*
Computer modem	63	*	7	*	11	*
Laser disk player	62	49	5	3	3	1
CD player that records	61	37	9	7	13	3
CD-ROM	60	*	8	*	9	*
Electronic organizer	53	30	3	2	6	3
DAT (Digital Audio Tape)	40	30	2	2	3	1
HDTV (High Definition TV)	40	28	4	4	3	1
Interactive TV player	39	13	4	1	1	*

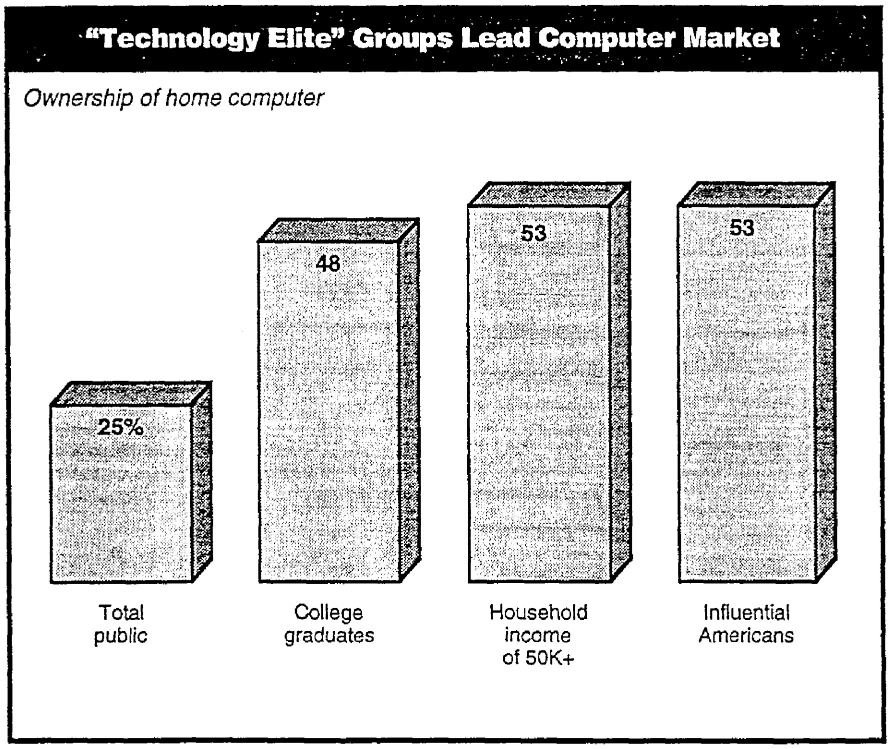
*Not asked that year

Awareness of many of the latest home technologies has already seen marked growth since just 1992. Across fifteen high-tech product categories, public awareness rose by an average of 11 percentage points. The largest increases in awareness came for pocket cellular phones (75%, up from 43% in 1992), video phones (64%, up from 41%), VCR Plus (70%, up from 43%), interactive TV players (39%, up from 13%), and lap-top computers (78%, up from 55%).

Levels of ownership and buying interest have increased, but at a far slower pace. Among the general public, ownership and interest remains in the single-digits for eleven of the fifteen products. However, among "technology elite" groups—that is, demographic groups with a strong propensity to invest in technology—double-digit ownership holds for ten of the products, suggesting ample growth potential. These groups include the affluent, college-educated Americans, and Roper's trendsetting Influential Americans.

The Home Computer Market: A Case Study For Emerging Technologies

Long-term trends in ownership of the *home computer,* in particular, provide a compelling example of the potential growth of new products on the technological horizon. In 1981, just 1% of the public owned a home computer. Ownership grew to the mid-teens by the end of the 1980s. Today, aproximately one-quarter of the public now live in households which own at least one personal computer[1]. And 20% of computer households have a lap-top and 16% have more than one computer.



Demand is still spear-headed by the "technology elite," however. Not surprisingly, interest in and ownership of computer technology is highly skewed by income, education, and profession. Among executives and professionals (49%), college graduates (48%), and households making over $50,000 a year (53%) current ownership levels are almost double the national rate. Likewise, while one in ten Americans expect someone in their household to purchase a PC within the next year, planned purchases are higher among executives and professionals (16%) and those making more than $50,000 a year (15%). Indeed, it may ultimately be technology which separates the nation's "haves" from the "have nots."

[1]Roper tracks PC ownership in American households even five weeks through in-person interviews with a representative sample of 2000 Americans. PC ownership has remained remarkably stable at about one-quarter of the public throughout the past year.

"Technology elite" groups have also created a growing computer after market. Modems, on-line services, printers and computer peripherals have begun to make a serious dent in the market-place. Indeed, as computer technology grows more advanced, PC owners are taking steps to upgrade their present systems. Only 2 in 10 PC households bought their *first* computer in the past year. Meanwhile, more experienced computer owners have upgraded their current computers in the past year by adding memory (23%), a modem or fax modem (15%), a CD ROM drive (13%), and a larger hard drive (11%), while 12% bought an entirely new additional or replacement computer. First printers were purchased by 13%, while 11% bought an additional or replacement printer. In terms of *planned* purchases, a printer is the only item that at least 1 in 5 PC households plan to purchase in the next year or two, while 1 in 8 plan to purchase a modem or a CD ROM drive.

While the technology "elite" are heavily involved in both the computer market and after market, there is a great deal of untapped potential among the general public. The computer industry—and technology industry more broadly—need to better understand the obstacles to purchase among the general market in order to break into it. The costs associated with a computer are what most frightens potential buyers away. Forty-four percent of Americans consider computers too expensive to buy, making it the strongest of eleven reasons not to own a computer. Other major reasons for not owning a computer are not seeing a need for one (27%), and concerns that computers purchased today will be quickly outdated (26%) or incur additional costs (23%). All of these reasons are far more important to people who don't currently own PCs.

Buying A Computer: Drivers And Deterrants

	Total Public	"Technology Elite" PC Owners	HH Income 50K+	College Educated	Influentials
	%	%	%	%	%
Top ten "major" reasons for owning a computer					
Teach/educate children	41	53	45	42	56
Computers becoming a necessity	35	57	48	46	53
Simplify routine tasks	34	59	46	48	56
Keep up with what kids are learning	30	37	30	24	38
Do office work at home	30	50	42	43	56
Be on forefront of new technologies	26	36	32	30	31
Do things you never could before	25	42	35	34	45
Computers are fun to use	20	31	26	24	30
Instant access to news/information	18	24	22	21	25
Communicate with others electronically	16	24	23	20	21
Top ten "major" reasons for not owning a computer					
Too expensive to buy	44	36	29	35	39
Don't see a need	27	13	19	21	17
Technology changes too quickly	26	23	23	25	27
Too many costs after purchase	23	16	13	16	16
Too difficult to use	22	13	13	17	15
Too complicated to set up	19	13	13	14	14
Not for my generation	11	5	5	6	5
Computers break/"crash" too easily	10	7	4	8	5
Computers are anti-social	10	7	8	9	7
Computer use is bad for health	8	6	5	7	3

What *is* driving current demand for computers? For people who don't currently own a computer, using it to help their children and keeping up with what kids are learning in school are viewed as the top two reasons to own a computer. Meanwhile, over one-half of PC owners cite simplifying routine tasks, the fact that computers are becoming a necessity, educating children, and doing work at home as major reasons for owning a computer.

Different purchase motivations among computer "haves" and "have nots" suggest that marketing to these two sides of the potential technology market may require very different messages. This lesson likely not only applies to the computer market, specifically, but to the high tech market overall.

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II. Home Computer Market

The majority of computer-literate Americans most likely had their first introduction to computer technology in the workplace. But a strengthening American leisure ethic suggests that the greatest potential for computers—as well as a host of new high-tech products—rests in the home. Today, more people than ever before place leisure as a priority over work. The shift toward leisure in part reflects the appeal of family time and leisure pursuits as the baby boom has moved fully into its child-rearing years. It also reflects a growing disillusionment with the workplace. The public's focus on leisure has led to a growing preference for *at-home* leisure activities, meaning opportunities for new forms of home entertainment.

Today, a plurality of Americans express a stronger preference for *at-home* leisure activities (44%) versus those done *out-of-home* (16%). Of course, staying in and going out are not mutually exclusive options: One-third of the public prefer both types of activities or say that it simply depends. The growing appeal of the home is borne out across a number of leisure activities that can be done either at or away from home. From watching movies to entertaining friends, increasing numbers of Americans prefer to do most activities from the comfort of their own home.

These trends have major implications for the home computer market. The leisure ethic—and growing appeal of the home—also propels Americans' desire to do more of their *work* at home rather than in the office. Consider recent trends in the public's use of computers at work and at home. Currently, one-third of Americans have used a computer somewhere during the past week. The "technology elite" are almost twice as likely than average to use a computer in a given week. The public's computer usage at work (23%) is still slightly more common than usage at home (17%). But people who use a computer at home spend about one fifth of their home computer usage on work related activities—and this proportion rises to about one-third among technology-elite groups. These trends suggest potential growth for the home office, and high-tech products required to set up and run the home office.

Use Of Computers: At And Away From Home

	Total Public	"Technology Elite" PC Owners	HH Income 50K+	College Educated	Influentials
PC Use in Past Week:					
At work or home	34%	81%	60%	60%	66%
At work	23	49	45	48	49
At home	17	70	39	38	41
Average Number of Hours Used PC in Past Week*:					
All places	15.4 hours	15.8 hours	17.3 hours	16.5 hours	15.6 hours
At work	16.4	16.4	15.9	15.5	14.7
At home	6.8	6.8	7.6	6.7	7.3
Average Percentage of Home PC Use Dedicated To Work**	22%	22%	31%	27%	37%

*Based on those who used a computer in the past week
**Based on those who used a computer at home in the past week

The computer not only serves as an office away from work, but it is a family-friendly product. Recall that the number one purchase motivation among non PC owners is the education of one's children. And while not yet true technology "elites," family households show above average ownership of the PC: 31% of households with children aged under 18 own a PC. In PC households, even the youngest children appear to be logging on. In computer households where there is a child aged 7 or younger, 40% say that a child between the ages of 4 and 7 uses the computer. For older children, the percentage is even greater: Three quarters of parents of 8-to-12 year-olds and of teenagers say their children use the household computer.

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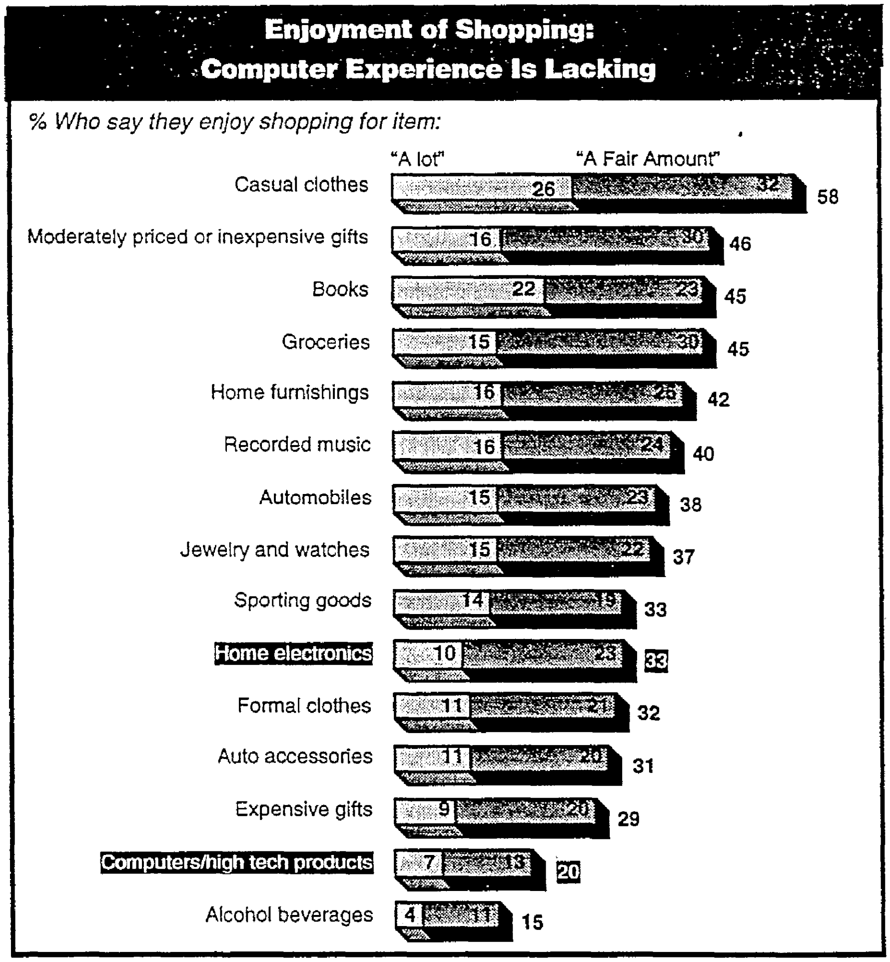
Software usage, furthermore, suggests that home computer use is both leisure-oriented and work-oriented. Word processing programs and games are the two most popular software applications used by people on their home computers. Over two-thirds of people with a computer in their home use word processing software—likely for work—but almost as many (56%) say they play games—a form of home entertainment. Spreadsheet and money management programs are popular with over a third of computer owners. At the same time, approximately one-quarter of computer owners each use children's educational and reference programs.

The trends toward at-home leisure options and the desire to work from home not only point to short-term growth in the home computer market, but have longer term implications for the technology industry. Clearly, dual benefit electronics products—those which provide information and entertainment like the computer—are sure have increasing appeal. Such trends also bode will for the "high-tech" home which promises to automate the entire household. Nevertheless, cost considerations, complexity, and the public's ambivalence toward technology overall will likely continue to be deterrents to these lofty electronic dreams for some time to come.

III. Shopping for a PC—Distribution System, Brands, Service

The computer market is still young; this is especially true when considering the distribution system. Although home computers are increasingly found at department and discount stores—the public's favorite shopping outlets—the "computer store" is still the main distribution channel for the product. Direct marketing also appears to be a fairly common channel for computer peripherals among true computer junkies, but may become a less desirable channel as the market for these products becomes more mainstream.

In general, shopping for a computer is still an "unnatural" and perhaps a daunting experience for many people. Consider that when the public is asked how much they enjoy shopping for fifteen diverse products, shopping for a computer comes up fourteenth. The picture does not improve much for home electronics overall; in terms of shopping enjoyment, a home electronics spree is rated tenth. And shopping for home electronics products promises to become still more daunting as these entertainment products become more complex.



As mainstream consumers—not just the "technology elite"—become a more sought-after target for high tech products, especially personal computers, the industry may need to focus greater attention on the shopping experience. Consumers' brand influences lend some useful insight into what shoppers will search for in the shopping experience.

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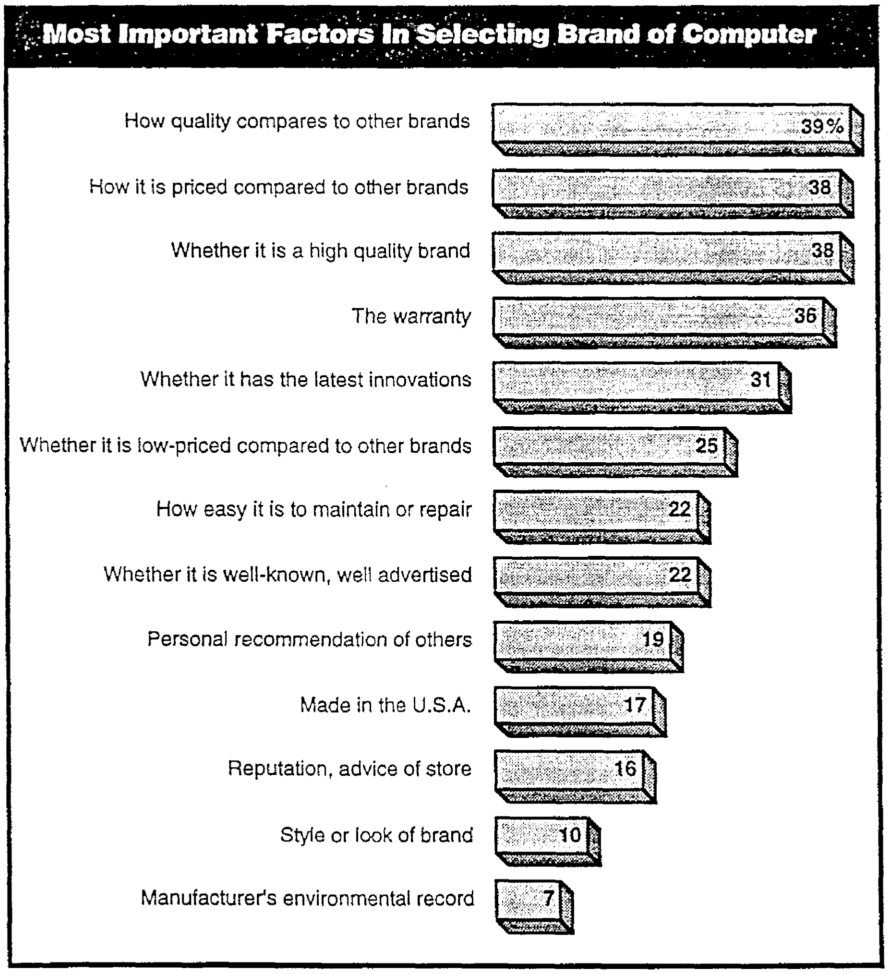
When selecting among brands of most consumer durables, price and quality are usually *by far* the two most important purchase drivers. However, while Americans say that quality and price are the top brand influences in their choice of a home computer, two other factors are almost as compelling: the warranty and whether or not it has the latest innovations. The fact is Americans may be simply be overwhelmed by the speed at which technology is changing today: They want a warranty that will provide them with service for their computer over the long-term and they want to know that the machine they purchase will not be obsolete next season. Emphasis on these factors underscore the need for personal service and technical knowledge in the computer shopping experience. Moreover, consumers discomfort with the PC shopping experience also suggests that high pressure sales tactics will hinder rather than help sales.



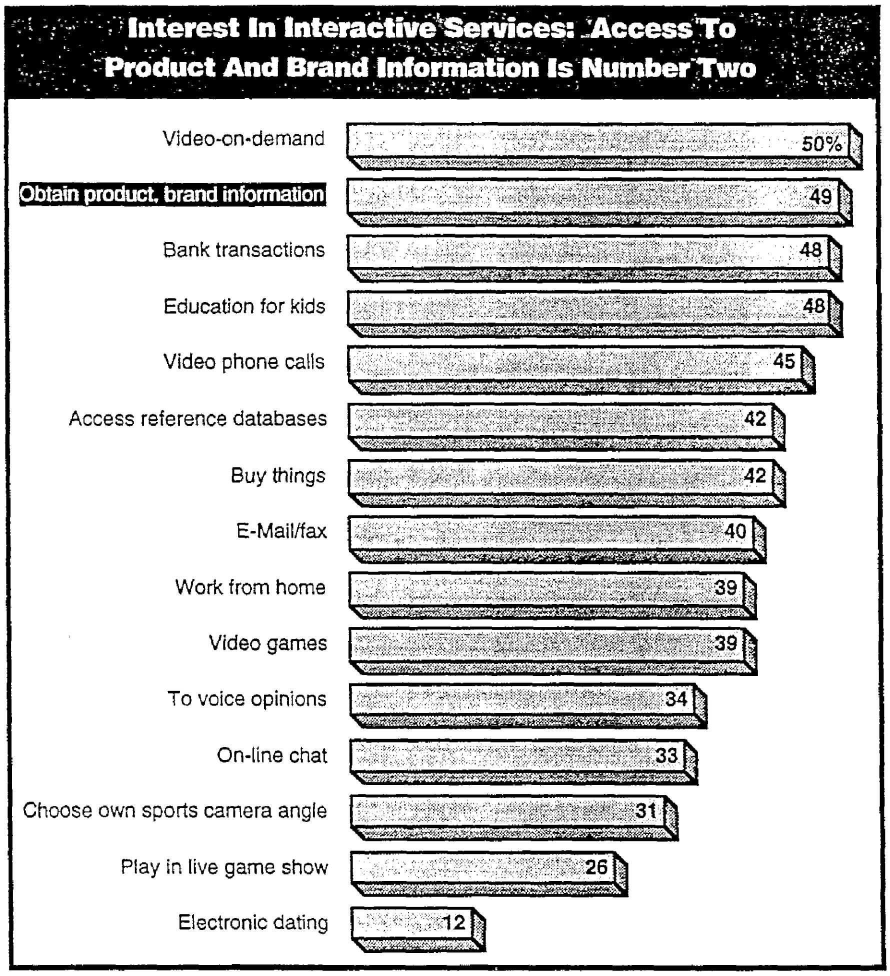
Consumer indecision over which brand of a home computer to purchase further suggests the importance of providing distinguished service to the potential computer customers. Currently, Americans see few differences between PC brands: Just 25%, down from 32% in 1993, think a "great deal of difference" exists between personal computer brands. This lack of brand differenciation also appears to hold among potential PC buyers, specificcally. Among the 10% of Americans who plan to purchase a computer this year, 28% say they plan to purchase an IBM compatible, and another 15% say they want an IBM, while one in five say they would like to purchase an Apple. Yet, a plurality of potential computer purchasers (31%) *say they haven't decided what type to buy yet.* It stands to reason that the shopping experience could be the tie-breaker between brands among first time computer shoppers.

IV. Info-Activism

A trend toward "info-activism" is also propelling the computer market. Today, Americans are seeking more active ways to obtain information—especially product and service information. They are learning that information equals power in the marketplace. As a result, they desire "self-serve" advertising which they seek out and control themselves. Exercising a healthy skepticism toward most traditional forms of advertising, they are looking to third-party information providers as consumer allies.

Technology is an empowering information tool for self-reliant, information-seeking consumers. Marketers have long used info-technology to study and market to consumers; now the tables are turned, as technology is being used against the marketers by consumers—through product reviews, clearing house information on prices, brands, etc.

Consider that when the public is asked which of fifteen interactive services they would be interested in using on a home computer, requesting product information is their number-two response, preceded only by video on-demand. Half of all Americans say they would like to be able to request information about specific products and brands using a home computer. (Another 42% say they would actually like to purchase things such as airline tickets, clothing, or things for their home via computer.) Among the "technology elite," interest in requesting product and brand information is exceptionally high: 69% of the affluent, 65% of the college educated, and 63% of executives and professionals envision themselves using the home computer to satisfy their info-activist needs.



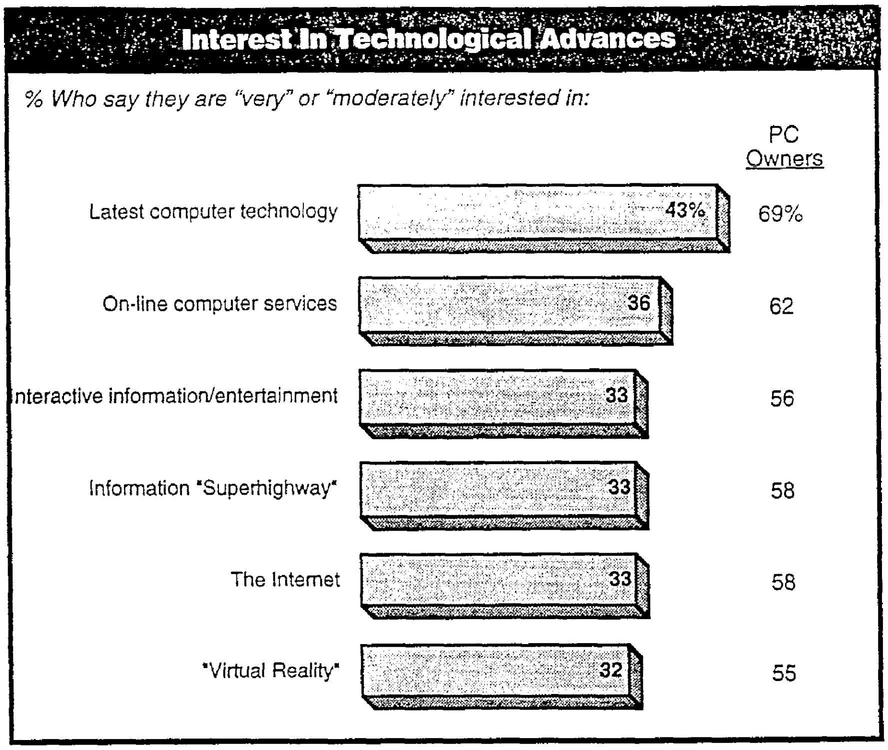
While this new form of advertising provides advertisers with an excellent opportunity, it will have to be very different from traditional print and broadcast advertising. Remember that the appeal of info-activism arose from consumer skepticism regarding most traditional advertising approaches. For info-activists, the personal computer represents an electronic version of *Consumer Reports*; they will likely respond well to advertisers that make useful, objective, and accurate information freely available through the electronic media.

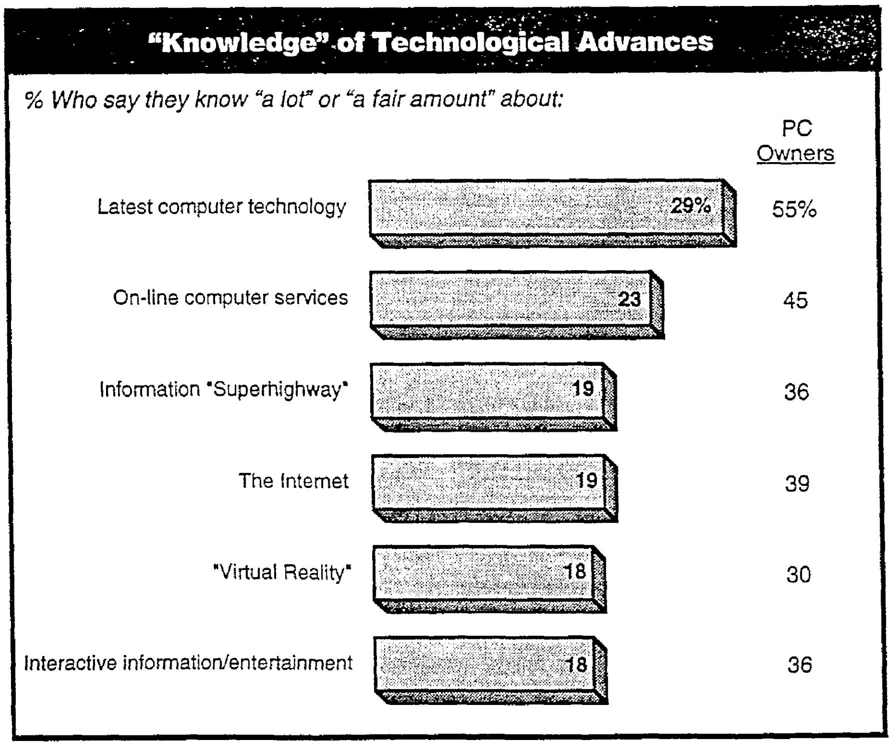
V. Future of Interactivity: How Fast, Who and What?

One of the most pressing questions for providers of technological products and services, from the computer industry to the telecommunications industry, is "when will the public forge full-speed ahead on to the information superhighway?" Those who had a vision of all Americans speeding onto the information superhighway immediately were probably paying more attention to the press hype than the public mood: The average American is no more interested or knowledgeable about new technologies than they were a year ago. Like most consumer trends, the adoption of new technologies is far more of an evolution than a revolution, and much of the early growth is concentrated among certain elite groups.

Somewhat surprisingly given the issues high profile over the past year, most Americans are no more interested in—or knowledgeable about—specific technologies than they were a year ago. Pointing to an increased polarization of the marketplace, however, interest and knowledge among the technology "elite" groups such as the affluent, college educated, and computer households—all of whom were much more interested and knowledgeable to begin with—has increased while others remained standing still.

Only about one-third of Americans have any interest in on-line computer services, interactive information and entertainment, virtual reality, and the information superhighway all basically unchanged since last year. Knowledge about these services has also remained low, with two-thirds of the public professing to know little about each. Only the Internet has seen an 8-point increase in both knowledge and interest among the general public.





Yet the seeds of an interactive public are beginning to sprout. Among computer owners, interest in the five trended services has increased an average of 8 points, while knowledge has grown by 6 points. The current interest levels for computer owners range from 55% for virtual reality to 63% for on-line services. Moreover, 15% of people in PC households (4% of the total public) acutally subscribe to on-line services, while 14% expect to get a new subscription to an on-line service within the next twelve months.

Other evidence of potential success in the interactive arena, Americans who are interested in five different interactive services are willing to pay between $9.60 and $14.30 to access the services, well within the range of what most on line services currently charge for a subscription. The public is willing to pay the most to access educational programs for children ($14.30) and the least ($9.40) to request product information. Nonetheless, no more than 1 in 4 Americans, and 4 in 10 PC householders, are interested enough in each of the services to be willing to pay anything. These percentages are much higher, however than the 4% of the total public and 15% of computer householders who currently subscribe to on-line services.

Debate over who will best deliver interactive services is still open. Whether interactive services will be delivered via home computer or television is not relevant to most consumers—the technology elite included. For consumers the general rule of thumb: Only the *content* of such services matters.

Which services will take off the fastest? As noted earlier, when asked which of fifteen interactive services they are interested in, video on-demand leads the pack (50%), followed by the ability to request product and brand information (49%), the ability to make bank transactions (48%), and access to educational programs for children (also 48%). These uses are also the leaders among the technologically elite—all of whom express far more interest than average in nearly all of the fifteen services except electronic dating and the ability to participate in interactive game shows or talk shows.

Conclusions

- Many of the products introduced during the late 1980s and early 1990s may have a second chance to arouse consumer interest, as Americans recover from "recessionary blues." Pent-up demand for the latest technologies will likely give way to purchases in the latter half of the decade.

- Demand for the home computer is still spear-headed by the nation's "technology elite" —executives and professionals, college graduates, and households making over $50,000 a year. In the next millennium, it may be technology which ultimately separates the nation's "haves" from the "have nots."

- Among non-PC owners, the greatest obstacles to purchase are cost, lack of a perceived need, and concerns that computers purchased today will become obsolete in the near term. These issues must be addressed if the industry is to tap the full potential of the mainstream market.

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- Computer "haves" and "have nots" offer different reasons for buying a computer. Hence, marketing to these two sides of the potential technology market will likely require very different messages. Messages to the "haves" might best focus on the practical and innovative, while those to the "have nots" should emphasize leisure and family enrichment.
- Be it the home office or the "electronic hearth," current at-home leisure trends suggest enormous potential for high-tech products that allow consumers to both work and play from the comfort of their own homes. Indeed, computer hardware, software, and other consumer electronics products that provide both information and entertainment such a the computer will become increasingly appealing as the desire to satisfy consumer, work, and leisure needs at home persists.
- Shopping for a computer and other home electronics is still less enjoyable than most other types of shopping. The complexity of these products—and the public's need for clear, understandable information—is the main reason why. At the point of purchase, there is a need for better personal service and technical knowledge than is presently available to consumers in the retail arena. Indeed, among first-time computer buyers, the shopping experience be a tie-breaker between competing brands.
- Today's skeptical consumers are looking for more active ways to obtain product and service information: They want to control the flow of the marketing information they receive. Technology is a key tool for information-seeking consumers: They will appreciate advertisers that make useful, objective, and accurate information available through the electronic media.
- The average consumer is not yet speeding onto the information superhighway. The adoption of the latest technologies is more of an evolution than a revolution, and much of the early growth is concentrated among "technology elite" groups.
- When it comes to the delivery of interactive services, consumers do not express a preference for a given delivery system (e.g. computer versus television). As end users, the public's main concern is *content*.