

Integrating IT into Daily Life: Findings from NRI's *Cyber Life Observations* Surveys

Juro TODA

Nomura Research Institute

Integrating IT into Daily Life: Findings from NRI's *Cyber Life Observations* Surveys

Juro TODA

- I IT Is Becoming Pervasive
 - 1 The Rapid Spread of IT
 - 2 People Are Creating New Uses for IT
- II Will Cellular Phones Replace Fixed-Line Telephones?
 - 1 More Middle-Aged and Elderly Users
 - 2 Use of Cellular and PHS Phones at Home
 - 3 The Emergence of the Mobile Internet
- III Has the Internet Become a Daily Necessity?
 - 1 The Internet as a Source of Information on Prospective Purchases
 - 2 An Increasing Variety in the Means of Access, Delivery and Payment
 - 3 Reliability to Increase as Companies Commit Themselves to E-Commerce
- IV Is That Enough?
 - 1 The Doubts That Shadow Cyber Life
 - 2 Fears of a Digital Divide
 - 3 Information Technology Has Only Begun to Play a Role in the Community
- V The Information Society of the Majority
 - 1 Coproduction by Producers and Consumers
 - 2 The Second Stage in the Integration of IT into Daily Life in Japan

An environment is gradually developing in Japan that enables people to use a variety of IT tools (media) ranging from cellular phones to the Internet whenever they want. This situation is at the point of transition from a stage in which people used IT equipment and services largely for their novelty and recreational value to one where these will form an integral part of people's daily lives. For this to happen, however, people's doubts will have to be dispelled, and the new equipment and services will have to demonstrate that they are reliable and cost-effective. As deregulation and other structural reforms are carried out and the necessary infrastructure is built, IT will become fully integrated into people's lives.

This paper is based on the results of a series of surveys (*Cyber Life Observations*) of men and women aged from 15 to 59 that have been carried out by NRI every six months since March 1997.

I IT Is Becoming Pervasive

1 The Rapid Spread of IT

Even though economic growth has remained weak and consumers have generally been cutting back on spending, there has been a surge in demand for IT equipment and services.

As can be seen in Table 1, more than 60 percent of respondents owned a cellular or PHS phone as of March 2000 and nearly 20 percent accessed the Internet at home. This amounts to an increase of 130 percent and 260 percent, respectively, in three years. On the infrastructure side, more than 10 percent of respondents used ISDN, while the proportion subscribing to CATV and digital CS broadcasting services had risen to 12.1 percent and 3.8 percent, respectively. Furthermore, the proportion using car navigation systems and fax machines had also increased, while nearly 30 percent used their TVs to play games—roughly the same as before.

This is leading to the gradual development of a “ubiquitous networking” environment in which—largely as a result of the falling cost of equipment and services—people can use a variety of IT tools (media) ranging from cellular phones to the Internet whenever they want.

2 People Are Creating New Uses for IT

Although most IT users in the past tended to be males in their twenties and thirties, usage has now been broadened to cover a wider age range from both sexes. And while a rapid increase in the number of users is generally

accompanied by falling per-user usage times and charges, this pattern has not been seen so far with respect to IT equipment and services such as cellular phones and the Internet. The reason would appear to be that users have created new uses for IT equipment and services, and continue to use them extensively even after purchasing them.

Whereas people used to use the Internet mainly for work or study, it is now used mainly for personal purposes such as emailing friends and viewing Websites related to users’ hobbies. Also, instead of merely surfing the Internet, people now also use it to collect product information and for e-commerce, for example.

Cellular and PHS phones, which were originally used to make calls when out of the office or when on the move, are now increasingly being used to make calls from home and are becoming more and more a personal possession. The range of uses has also broadened to include using phones to send and receive email and access the Internet independently of other devices.

Nor are these new uses confined to the younger generation. The fact that people from a wide age range use IT in these new ways is a departure from the earlier wave of interest in pagers. IT has already become a part of people’s daily lives.

II Will Cellular Phones Replace Fixed-Line Telephones?

1 More Middle-Aged and Elderly Users

The proportion of respondents using cellular and PHS phones for personal purposes (the “personal usage rate”)

Table 1. IT Equipment and Services: Changing Patterns of Personal Usage (March 1997-March 2000)

		First survey March 1997 N = 3,067 (Users/subscribers, %)	Seventh survey March 2000 N = 1,410 (Users/subscribers, %)	Change (%)
Major changes	ISDN lines	0.8%	10.2%	1,180
	Digital CS broadcasting services	0.7%	3.8%	440
	Internet	4.6%	16.7%	260
	Car navigation systems	3.2%	8.7%	170
	Portable minidisc players	4.3%	11.5%	170
	Cellular/PHS phones	27.1%	62.1%	130
	Personal computers	14.2%	29.2%	110
Minor changes	Fax machines	20.0%	32.8%	60
	Widescreen TVs	17.2%	24.5%	40
	CATV	9.0%	12.1%	30
Few changes	High level of keyboard skills	24.8%	30.3%	20
	Portable CD players	27.0%	28.7%	10
	TV games	26.3%	27.0%	0

Note: The figures for users are the percentage of respondents who use the item in question at home, while the figures for subscribers are the percentage of respondents whose households subscribe to the service concerned.

Source: *Cyber Life Observations* (Surveys 1-7), NRI, March 1997-March 2000.

has steadily increased, reaching 62.1 percent by March 2000. (See Table 1.) This is an increase of 35 percentage points in three years.

Although this development has been led by users in their twenties, the biggest change has been in the spread of use to women in their fifties, 33.0 percent of whom now use cellular or PHS phones. (See Figure 1.) This embrace of the new technology by women of this generation, generally regarded as technophobes, is a strong indication that cellular and PHS phones are now part of the social infrastructure.

2 Use of Cellular and PHS Phones at Home

There are clear indications that cellular phones are replacing fixed-line telephones. One sign is the fact that as of March 2000 (unless indicated otherwise, this date applies to all the findings in this report) 20.4 percent of users preferred to use a cellular or PHS phone rather than a fixed-line telephone when calling from home. One of the main reasons is that they can store the names and numbers of the people they want to call on their cellular phones.

Also, 37.3 percent of cellular and PHS phone users calling people at home call their cellular or PHS phone number rather than their fixed-line number. The main reason is apparently to make sure that the call reaches the other person even if the called party happens not to be at home.

Users appear to treat their cellular or PHS phones as extensions of themselves. This attitude is no longer con-

finied to younger users and has even spread to users in their thirties, forties and fifties.

Just as cellular phones in Japan have largely assumed the role that used to be performed by public telephones, they are likely eventually to assume the role still performed by fixed-line telephones. One day, the relative importance of the two as means of communication is almost certain to be reversed.

3 The Emergence of the Mobile Internet

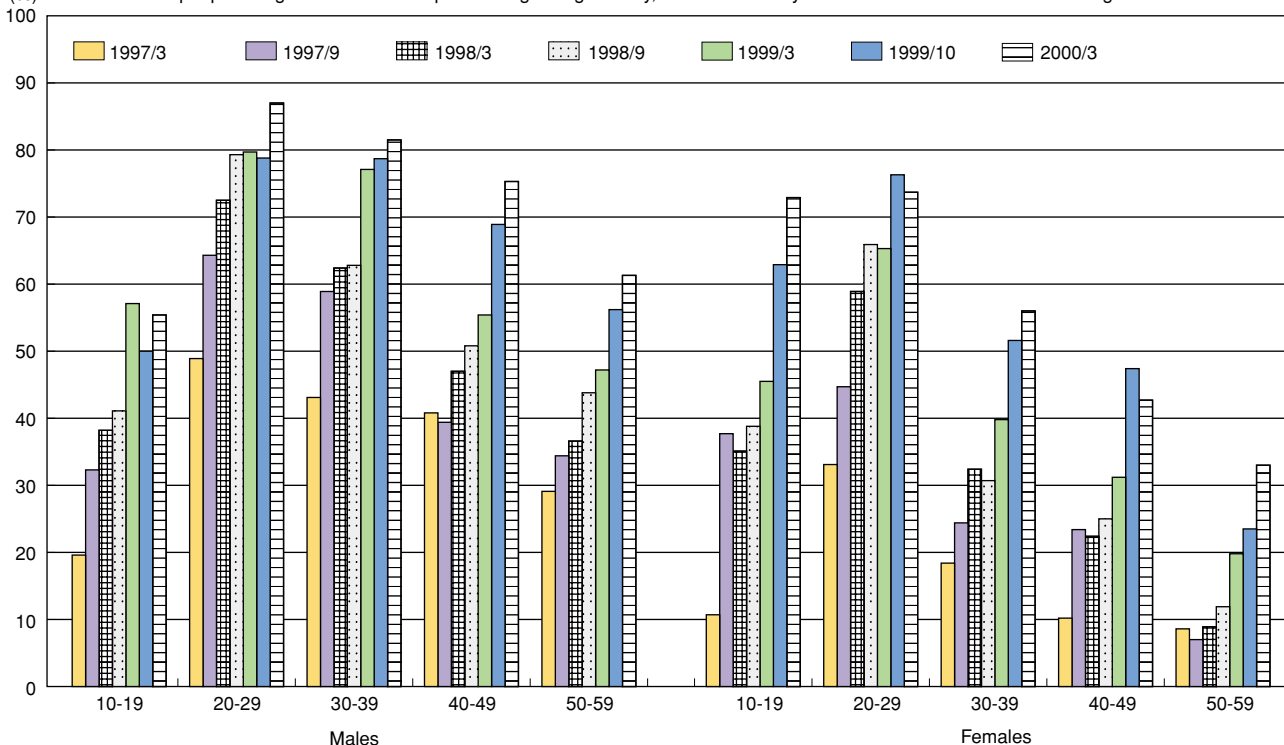
Cellular and PHS phones are no longer simply devices for making telephone calls. As they have become increasingly multifunctional, their importance as all-round information terminals capable of sending and receiving not only voice but also data, text and images has become considerable.

Among cellular and PHS phone users, 12.5 percent use these devices to send and receive email. The personal usage rate among 10- to 19-year-olds is particularly high, having shot up by 5 percentage points to 17.7 percent in just under six months. In view of the fact that more than 70 percent of this age group (a much higher proportion than in any other) already uses cellular and PHS phones to send and receive short messages, it can be expected to continue to set the trend in the use of these devices to send and receive text.

People are accessing the Internet using an increasing variety of devices. (See Figure 2.) For example, 9.9 percent of respondents now use cellular or PHS phones to access the Internet either independently of or in combi-

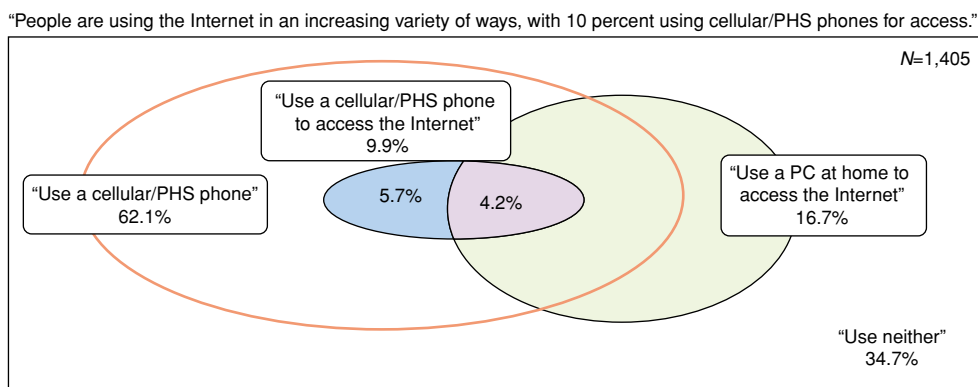
Figure 1. Personal Cellular/PHS Phone Usage Rates

(%) "The number of people using cellular and PHS phones is growing steadily, with one in every three women in their fifties now using them."



Source: *Cyber Life Observations* (Surveys 1-7), NRI, March 1997-March 2000.

Figure 2. Overlapping Use of Cellular Phones, the Internet and Mobile Access to the Internet



Note: "Mobile access to the Internet" denotes use of a cellular/PHS phone (whether independently of or in combination with another device) to send and receive email or use information services. The use of text messaging is excluded.

Source: *Cyber Life Observations* (Survey 7), NRI, March 2000.

nation with an information terminal. The widespread use of devices other than personal computers for this purpose sets Japan apart from many other countries.

III Has the Internet Become a Daily Necessity?

1 The Internet as a Source of Information on Prospective Purchases

Nearly half of those who use the Internet at home use it to find out prices and other product information before they make a purchase. (See Figure 3.) The most popular Websites for this purpose are those on PC-related products, hotels, holidays, books and magazines, and automobiles.

Some 60 percent of those who do this then purchase the item either on the Internet or at a physical outlet. Although the percentage of those who make the purchase at a physical rather than a virtual outlet is high even among this group, a high percentage do use the Internet to book a hotel room (Internet: 17.5%; physical outlet: 7.0%), buy clothes and accessories (Internet: 8.8%; physical

outlet: 3.5%) or *oseibo* (year-end) and *ochugen* (mid-year) presents.

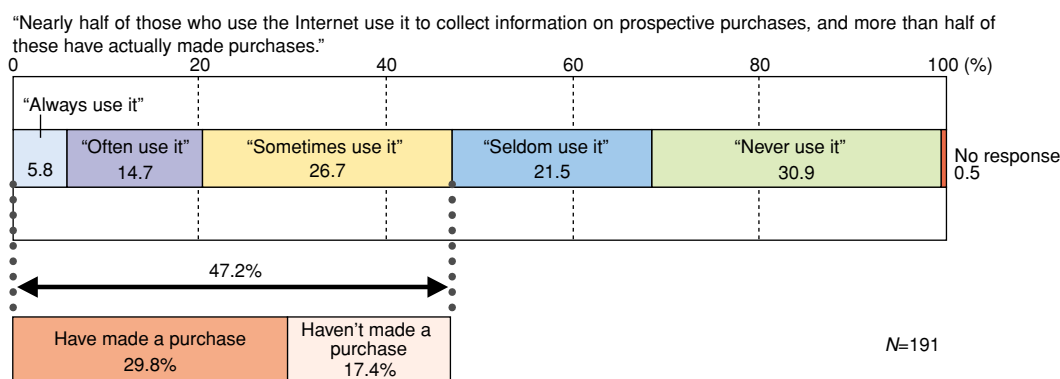
2 An Increasing Variety in the Means of Access, Delivery and Payment

By now, many people have come across the term "e-commerce" (or electronic commerce). The percentage of respondents who had engaged in e-commerce roughly doubled to 4.7 percent in the 12 months to March 2000. At nearly 10 percent, usage is particularly high among males in the 20-29, 30-39 and 40-49 age groups. This higher usage among men is one of the characteristic features revealed by the surveys. Similarly, 23.1 percent of respondents indicated that they would like to engage in e-commerce, with younger respondents showing the greatest degree of interest.

In spite of the fact that e-commerce is basically shopping (involving the use of a personal computer at home to do things such as ordering goods and booking tickets), the activity currently appears to be dominated by males (who are used to using computers) and younger people.

However, e-commerce is likely to become more popular in Japan as people use information terminals (often

Figure 3. Use of the Internet to Collect Information for a Prospective Purchase, and Rate of Actual Purchases



Note: Total number of people who use the Internet at home = 100 percent.

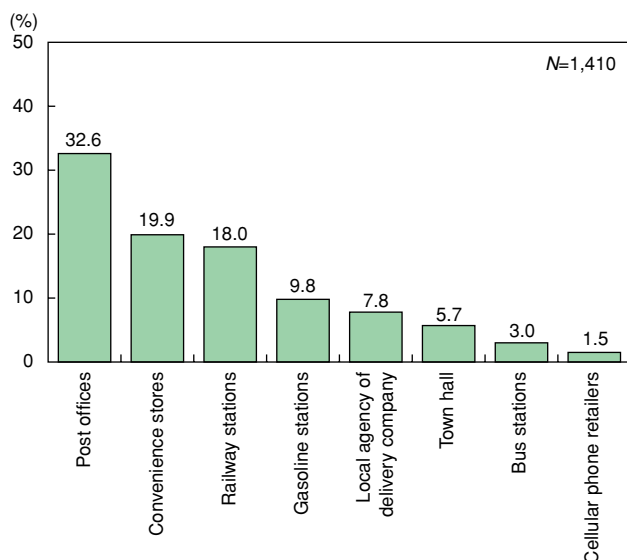
Source: *Cyber Life Observations* (Survey 6), NRI, October 1999.

called “Internet kiosks”) located in railway stations and convenience stores. If that happens, a broader range of people will use e-commerce, opening up new horizons. Mobile terminals such as cellular and PHS phones will also serve to open up the e-commerce market.

The survey shows that many people would like these e-commerce information terminals to be located in places such as post offices (19.1%), railway stations (18.5%), convenience stores (8.1%) and gasoline stations (7.9%). They also expressed preferences for where they would like to pay for and pick up their e-commerce purchases. The most popular choice was post offices (32.6%), followed by convenience stores (19.9%), railway stations (18.0%) and gasoline stations (9.8%). (See Figure 4.)

Women of all ages expressed a preference for post offices, while younger respondents preferred railway stations and convenience stores. (See Figure 5.)

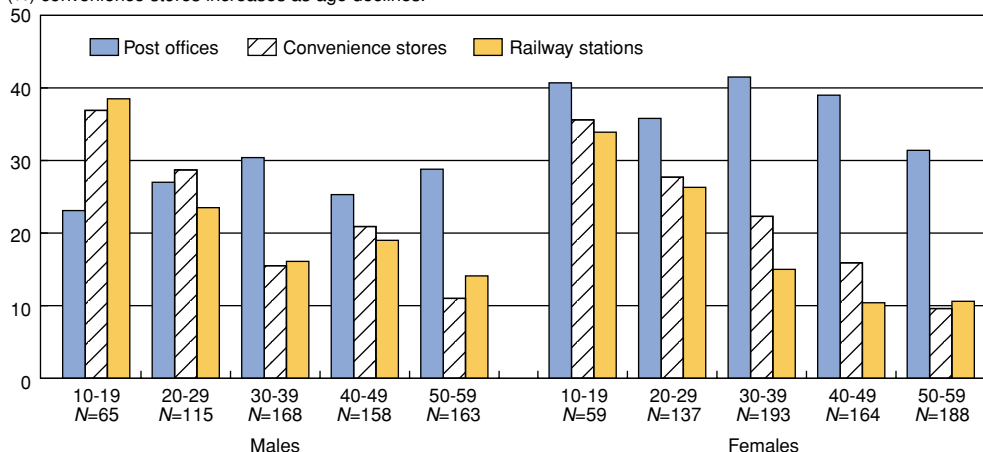
Figure 4. E-Commerce Users’ Preferences for Delivery and Payment Location



Source: *Cyber Life Observations* (Survey 7), NRI, March 2000.

Figure 5. E-Commerce Users’ Preferences for Delivery and Payment Location (by age and sex)

“A high percentage of women prefer post offices, while the percentage of users preferring railway stations or convenience stores increases as age declines.”



Source: *Cyber Life Observations* (Survey 7), NRI, March 2000.

Convenience store chains are busily devising and implementing strategies to set up e-commerce networks all over Japan. However, the survey’s findings would suggest that post offices, railway operators and oil companies all have similar business opportunities

3 Reliability to Increase as Companies Commit Themselves to E-Commerce

E-commerce in Japan has made a start. However, prospective users are deterred by a host of concerns: “The goods that arrive may not be what you thought you had ordered,” “Someone might gain access to your personal data,” “There’s no guarantee that the goods will arrive,” and so on.

If companies are to eliminate such worries, they will have to ensure that their e-commerce systems are reliable. While there have been many obvious improvements to the customer interface, much more probably needs to be done to improve the infrastructure (e.g., the ways in which goods are delivered and paid for).

E-commerce cannot function without payment and delivery systems. Provided companies have a large number of retail outlets and an efficient distribution system (like the convenience store chains) and systems for ordering and paying for goods over the Internet, e-commerce will become part of daily life.

Other companies with brand recognition and payment systems (such as delivery companies, chain store operators and financial institutions) will decide to join convenience stores in trying to capture a share of the e-commerce market. When that happens (and the back-office systems that remain invisible to the consumer are upgraded and become more reliable), people’s doubts about e-commerce will gradually evaporate and it will become an integral part of daily life.

IV Is That Enough?

1 The Doubts That Shadow Cyber Life

The survey showed that 90 percent of respondents believe that the gap is widening between those who know how to access information and those who do not. (See Figure 6.) This means that most people are concerned about the digital divide. At the same time, although more than 80 percent of respondents think that the spread of information technology will make life more convenient, only 40 percent believe that it will encourage people to socialize and communicate more. Moreover, a high proportion (80%-90%) of respondents are concerned that the spread of information technology may lead to the infringement of their privacy and a rise in crime.

It would therefore appear that, in general, people are anticipating the negative aspects of cyber life and that any positive expectations are confined, at least for the time being, to consumer activities such as e-commerce. If cyber life is to develop, information technology will have to ensure that families and communities communicate more and that social systems function (and are seen to function) better.

2 Fears of a Digital Divide

As information terminals and network services have become more common, the problem has emerged of a digital divide (i.e., a widening gap between those who know how to use IT equipment and those who do not). In the case of many products (and not just personal computers), it is obvious that high-income consumers are more likely to buy them than low-income consumers. How-

ever, to describe this as a digital divide is perhaps to read too much into it.

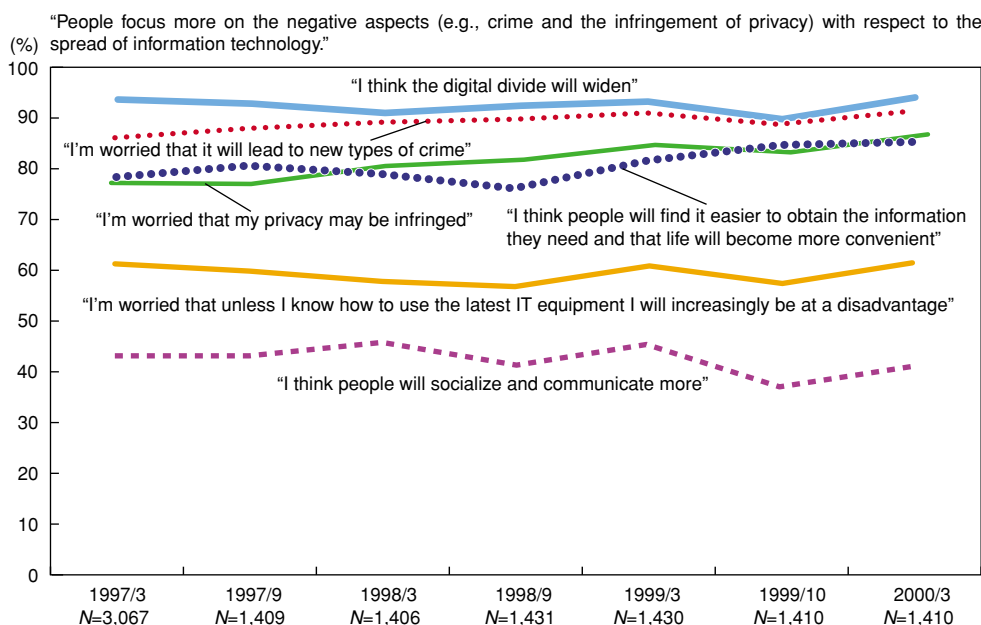
In the case of any product, the proportion of high-income owners declines as the price falls and more people come to own the product. As a result, the average annual income of the product's owners declines, and the gap between them and those who do not own the product narrows. However, this has not happened so far in the case of personal computers.

Although the March 2000 survey showed little overall change in household incomes, the annual income of households with a personal computer has started to rise while that of households without one is falling more noticeably. The gap between the two has therefore begun to widen. If we assume that the average annual household income in the September 1997 survey was 100, the March 2000 figure for households with a computer is 93 and for households without a computer 83. (See Figure 7.) If owning or using a personal computer is going to become a prerequisite for earning a high income, there is a risk that the gap is going to continue to widen.

So long as the digital divide remains simply a matter of computer literacy, it need not become a major issue. But there is no guarantee that whether or not someone owns a personal computer will have no major impact on that person's income and standard of living.

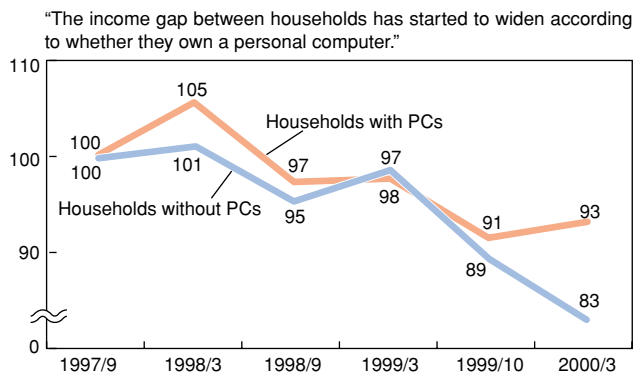
A good example of this is the trading of financial products. The survey showed that 7.4 percent of those who trade such products have at some time traded foreign-currency deposits, investment trusts, shares, bonds or other such investment-type products on the Internet. Indeed, 20.1 percent of respondents cited the Internet as their preferred channel for buying such products in the future. Among those who already use the Internet, that figure was even higher (47.9%). If the Internet comes to

Figure 6. Attitudes to the Spread of Information Technology



Source: *Cyber Life Observations* (Surveys 1-7), NRI, March 1997-March 2000.

Figure 7. Relationship Between Ownership of a Personal Computer and Annual Household Income (1997/9 = 100)



Source: *Cyber Life Observations* (Surveys 2-7), NRI, September 1997-March 2000.

dominate such trading, Internet skills may lead to disparities in wealth.

But is there really a problem here? If the Internet is a tool for discovering digital opportunities, it should actually help to bridge the digital divide.

What distinguishes the spread of information technology in Japan from that in many other countries is the fact that a wide range of media exists within easy reach. (These include not only personal computers and fixed-line telephones, but also cellular phones and Internet kiosks.) If anyone in Japan wants to use information technology, it's readily available at any time and at relatively modest cost. In the not too distant future, moreover, cable Internet and digital BS broadcasting services will also become widely available.

If the (relatively low) ownership rate of personal computers and the (relatively high) communications costs in Japan are the only criteria that can be used to judge whether or not a digital divide exists, Japan's future must be considered precarious. However, if the existence of a wide range of media for accessing the Internet is also taken into account, the digital divide should not present Japan with any major problems.

It is up to individuals whether they use information technology or not. It is surely wrong to label someone as "digitally illiterate" simply because one chooses not to use information technology.

3 Information Technology Has Only Begun to Play a Role in the Community

Nearly 40 percent of people in Japan engage in some kind of community activity, whether it be their neighborhood association, a parent-teacher association or voluntary work (e.g., environmental conservation or social welfare). Most of this communication is still done using the "three great media," as they are called: the telephone, face-to-face communication, or the neighborhood circular. According to the October 1999 survey, only 10 percent or so use cellular phones or fax machines, and only

2 percent or so use email or electronic bulletin boards. Although some neighborhood associations do use the Internet (rather than the slower circular) to keep members up to date on current news, information technology has only begun to play a role in the community.

Although it might be unrealistic to expect groups of volunteers (like the electronic communities in the United States that help the digitally less literate in their local community) to spring up overnight in Japan, taking one step at a time in this direction might well prove an effective way to promote the use of information technology in the community. Whereas market forces will ensure that people embrace information technology in their capacity as consumers, these same people will have to make a conscious effort to promote the use of information technology in their local community. There will therefore inevitably be a time lag between the two.

Simply making it easier for people to spend and manage their money would make cyber life a very one-sided affair. Using information technology to improve communication at home and in the community will help to dispel people's doubts about cyber life. Only then will people begin to enjoy the full benefits that information technology can bring to their lives.

V The Information Society of the Majority

1 Coproduction by Producers and Consumers

Not so long ago, personal computers were used mainly for work or study. There was a sense of crisis and a fear of being left behind if one did not know how to use a personal computer. The situation today, however, is that most people are happy to admit—whether it is true or not is a different matter—that they use the Internet for fun at home. Moreover, the same sense of fun that made pagers so popular is helping to popularize cellular phones, the Internet and mobile access to the Internet.

The same embrace of information technology that began with the 10-19 and 20-29 age groups has started to spread to other groups in society—regardless of gender or age. New lifestyles will emerge from this process, which is going on all the time now in Japan.

The reason people are using a greater variety of means of communication than ever before is that a cycle has started whereby (1) people devise uses for existing media, (2) new media and services are then launched to cater to these uses, and (3) new uses are then devised for these new media. Another major factor helping to spread the use of information technology is the way in which digital technology not only improves performance but also reduces prices, thereby making it possible for people to benefit from technological innovation at a relatively low cost.

It is fortunate for information technology in Japan that people are now beginning to follow the lead taken by business. Consumers and producers are taking part in digital coproduction.

2 The Second Stage in the Integration of IT into Daily Life in Japan

Information technology in Japan seems to have begun the second stage of its integration into daily life. In this second stage, information technology is used to perform everyday tasks rather than for fun or relaxation. It remains to be seen whether business and government will be able to make the most of this opportunity.

The current situation in Japan is that e-commerce carried out via convenience stores and financial trading conducted on the Internet are gradually becoming part of daily life and will soon have to demonstrate whether they are capable of becoming daily necessities. If information technology is to be used not in its now familiar role as a form of entertainment but as a tool of daily life, people's concerns will have to be overcome and their confidence gained. People's attitudes concerning the cost effectiveness of information technology will also probably change, and system failures and leaks of personal information will no longer be tolerated.

There are a whole host of issues related to e-commerce, including those of the dissemination of illegal and harmful information, Internet taxes, copyrights and human rights. Government has a major role to play in regulating use of the Internet without choking its development and in creating social systems.

The fact that many people have doubts about information technology—while accepting it as a form of entertainment—is largely a result of their frustration that

Japan's social systems show no sign of changing and of their lack of confidence in its social infrastructure.

Promoting information technology is an important aspect of government policy (as indicated by the fact that this was one of the items on the agenda of the Okinawa Summit), and is one that needs to be addressed sooner rather than later. This is because the issue is synonymous with economic deregulation. Although the efficiency and rationalization benefits of information technology are obvious by their very nature, such benefits will not be felt to the full if information technology is simply applied to existing structures. At the same time, service providers—protected by regulations on the one hand and shackled by them on the other—are themselves often slow to embrace new technologies.

Therefore, unless radical reforms are made to the way in which service providers operate, no one—whether it be the average citizen (who stands to benefit in daily life), companies (which should seize new business opportunities), or government (which should implement efficient policies)—will enjoy the full benefits of the spread of information technology as it enters the second stage of its development.

This paper has dealt with only some of the findings of the *Cyber Life Observations* surveys. As I mentioned at the beginning, the surveys have approached the ways in which ordinary people use information technology from a variety of angles. We will continue to carry out these surveys and would be pleased to hear from interested readers so that we can incorporate their views in our research.

Juro TODA is a senior consultant in NRI's Information & Communication Industry Consulting Department. He is a specialist in business strategy and marketing.

As a leading think-tank and systems integrator in Japan, Nomura Research Institute is opening new perspectives for the 21st Century through creating intellectual property for the benefit of all industries. NRI serves domestic as well as overseas clients both in the public and private sectors through knowledge creation and integration in the three creative spheres of “Research and Consulting,” “Knowledge Solutions” and “Systems Solutions.”

With the opening of the new millennium, the world economy is facing rapid structural changes led by the dramatic growth of IT industries and the rapid expansion of worldwide Internet users—the challenges of which require new concepts and liberation from outdated systems. As one of Japan’s top solutions providers, NRI is dedicated to equipping its clients with strategies for success in this difficult environment through providing the best in knowledge resources and solutions.

NRI Papers presents selected works of NRI’s 3,000 professionals in its worldwide research network. The mission of *NRI Papers* is to contribute new ideas and insights to business management and future policy planning that are needed to overcome many of the obstacles before us.

All copyrights to *NRI Papers* are reserved by NRI. No part of this publication may be reproduced in any form without the prior written consent of NRI.

Inquiries to: Editorial Section I
Corporate Communications Department
Nomura Research Institute, Ltd.
E-mail: nri-papers@nri.co.jp
FAX: +81-3-5255-9373