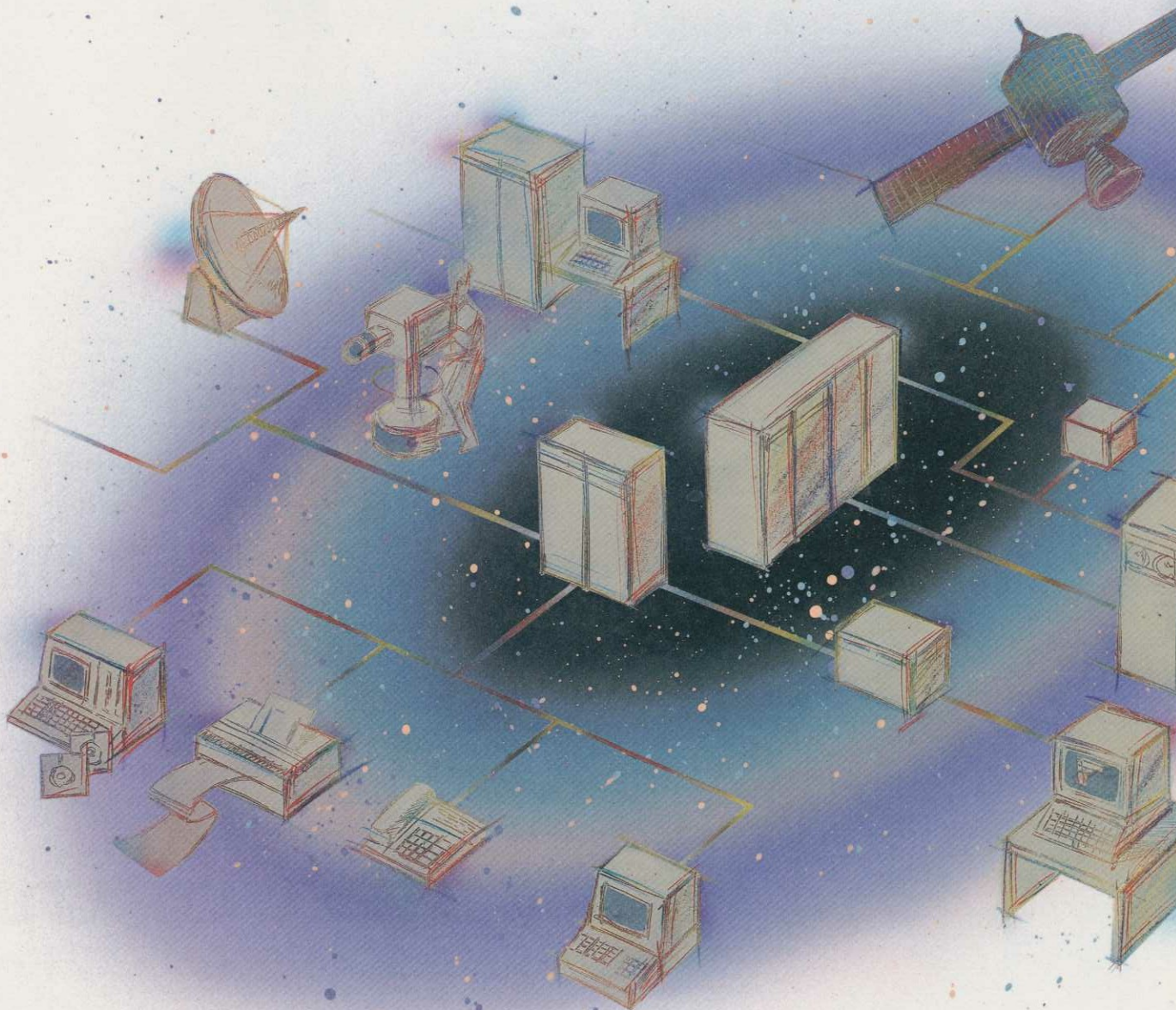# Information Out of Formation

By Masanori Moritani

Masanori Moritani is a technology commentator. He joined the Nomura Research Institute in 1967 and served as a director in charge of industrial technology research up to the end of last March. He has written various books on technology.

The term *joho-ka shakai* (information society) has been in currency in Japan for about 20 years, dating back to the late 1960s. This term was originally devised to describe one possible pattern of futuristic society, and since there were not yet any examples of the society existent, it was some time before people could even agree on how to translate the term into English.

There was a boom in predicting the

future at the time, and a number of commentators devised quite elaborate forecasts of what life would be like in the information society. Because this was also a period of rapid growth for the Japanese economy, most of the visionaries were quite optimistic in predicting that Japan would move from an industrial society to an information society.

However, unlike industrial output, the products of the information society defy easy quantification, and it is difficult to specify exactly how the information society will operate and how it will be structured. Thus most of the models that were proposed tended to be vague abstracts.

At about the same time as the academics were theorizing, there was a burst of interest in management information systems (MIS) in Japan. With people predicting that computers would be introduced to facilitate corporate management, an industrial MIS fact-finding mission traveled to the United States in the late 1960s and came back quite impressed at the potential for the future that they had seen there. Yet MIS turned out to be a MIStake, and the the computers that were installed were turned primarily to routine and repetitive tasks.

This is just one of the many great expectations that has been betrayed on the way to the information society. In fact, about the only thing that has proceeded as expected has been the fact that companies have put in more and more computers every year, yet even this has departed somewhat from the script as this computing capacity has been used mainly in-house and has not had the expected impact on society.

When the oil crisis of 1973 blew Japan's rapid-growth expectations out of the water, a cloud of gloom seemed to settle over both the economy and the society at large. However, this has been dissipated somewhat with the high-technology growth in the 1980s. Electronics has been the main driving force behind this high-tech growth, sparking renewed hopes that the rapid advances and widespread commercialization of semiconductor technologies will lead at last to the emergence of an information society. One of the prime prerequisites for an information society is that high-capability information processing equipment be cheaply available throughout society, and semiconductor technology has made this possible.

The next fad to sweep Japan was a fascination with the "new media" for transmitting information electronically. The new media provided material for numerous newspaper, magazine and television special reports, as well as innumerable books to fill the "new media corner" shelves.

Among the new media were such diverse media as cable television (CATV), which was then just developing in the United States and was expected to crop up in Japan as well, videotex, teletext and communications satellites and broadcast relay satellites. Nippon Hoso Kyokai (NHK; the Japan Broadcasting Corporation) developed its high-definition television (HDTV) about this time, and Japan moved quickly to popularize multiplexed TV sound and PCM (pulse code modulation) audio broadcasting.

In industry, there was considerable interest shown in value-added networks (VANs)—especially after the state-run Nippon Telegraph and Telephone Public Corporation was privatized in April 1985 to become NTT Corporation and the telecommunications field was deregulated to a degree. It was, in fact, NTT that helped fuel the "new media" boom by unveiling its interactive information network system (INS). This INS is an integrated-service digital network (ISDN) that will be able to provide all manner of information communications services nationwide once today's copper cables are replaced by optical fiber in the 1990s. In the fall of 1984, NTT installed its INS system for trial operation in the western Tokyo suburb of Mitaka, prompting another round of commentary on the dawning information society.

At the same time, however, there was also a waning of abstract speculation about what life would be like in the information society as, with the physical hardware in place and clearly feasible, people turned more to the kinds of information that these systems would carry. Thus it is that Japan has seen a new generation of theorizing under the catch-all category of the *kodo joho shakai* (advanced information society).

The boom that never was

What has happened to the new media boom in the last half decade? To be blunt, the boom has bust. The major electronics companies are scaling back their new media development divisions, and popular interest has ebbed.

Although there have been amazing advances achieved in very large-scale integrated circuits (VLSIs) and other electronics technology, the technology has gotten out ahead of such software questions as what kinds of information are to be processed and communicated for what purposes. Only in the office automation field, where companies had the clear-cut objective of rationalizing and streamlining operations, has the electronics revolution been won.

Typical of the new media bust are the difficulties encountered by CATV and the market failure of the CAPTAIN (character and pattern telephone access information network) system. Although there was a rash of plans hatched nationwide for CATV, not as television reruns but as new media for new types of information, all of these plans are now far behind schedule and most of them have gone back to the drawing board. The main reason for this collapse of expectations has been that the planners have no solid ideas on what kinds of programming will attract and hold enough local subscribers to make their systems viable.

Although most observers have felt that
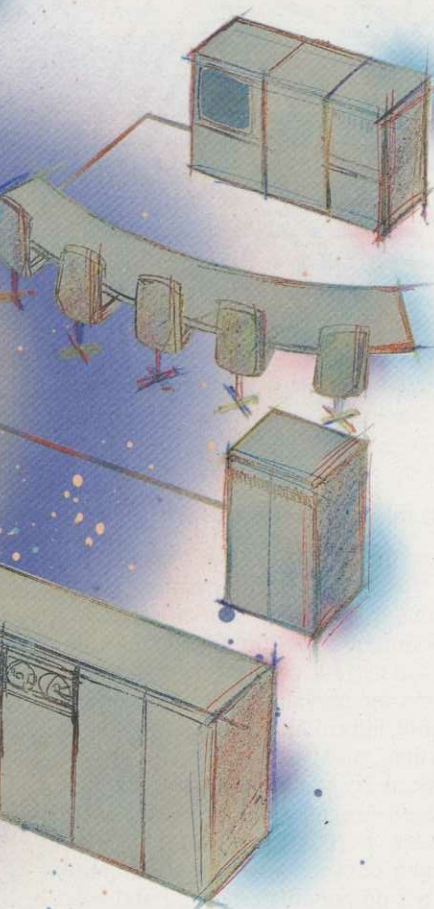
a trend that succeeds in the United States will eventually find its way to Japan, this blind assumption sandbagged the CATV people who failed to take account of the national differences in drawing up their plans: Americans prefer movies to original television programming and Japanese prefer the little screen to the big.

The CAPTAIN system is a Japanese videotex system developed by NTT utilizing the thousands of intricate *kanji* that characterize Japanese writing rather than the simpler Roman alphabet used in the West. Although the CAPTAIN system has been commercially available for two and a half years now, it has fewer than 30,000 subscribers, very few of which are households.

There are a number of reasons for the CAPTAIN system's unpopularity. First is the fact that the early terminals cost over ¥200,000 (approximately $1,350 at the rate of ¥150/$), which was very steep by Japanese standards. Although Japanese companies have a demonstrated ability to mass produce high-quality equipment at low cost, this prowess was nowhere in evidence in the CAPTAIN story. The second factor was that, although the system's sponsors had taken pains to provide a wealth of information, this turned to their disadvantage as users found it troublesome to access the information they wanted. Third, there was very little of this plethora of information that was truly useful and available only on the CAPTAIN system. Instead, most of the information was repackaging of things already available in the print media. Indeed, some people have said that Japan is already an information society by virtue of the vast amounts of information available in traditional channels.

Nor did teletext take off. Although Japanese companies are usually quick to incorporate new developments, only one company offered television sets with a built-in teletext capability. There was a very active cottage industry in talking about the new media, but Japanese companies were more hard-nosed when it came to evaluating the market for this equipment.

Over the past few years, however, a number of information devices, although not strictly new media hardware, have found their way into Japanese homes. Primary among them is the "fami-con" computer for video games. The personal computer boom of five years ago quickly collapsed under its own technical weight, but the game-oriented fami-con has already sold over 10 million sets in the last three years. With the abundance of game software and the fact that these sets

(basically drives equipped with joy sticks) sell for under $100 each, they have swept the market. While these family computers are not now considered part of the new media phenomenon, it is expected that modem interfaces will soon be developed to create a massive electronic network nationwide.

Video cassette recorders (VCRs) are also in very widespread use, with one out of every two Japanese households having a set. There has also been conspicuous growth in the market for compact discs (CDs). While video discs have lagged somewhat behind compact audio discs, they are expected to show steady growth. Most commentators have tended to ignore these packaging innovations, primarily because they were not seen as exciting technological breakthroughs, but this is just one more indication of the fact that the boom has been technology driven. It is an ironic fact that the largely ignored packaging innovations have been among the best sellers.

At the same time, Japanese-language word processors have gotten much cheaper over the last few years, with

prices falling from ¥200,000 to ¥100,000 and now to less than ¥100,000, and they have come into quite widespread use.

The miscalculations

From this discussion of the ups and downs of demand for information-related systems, it should be clear what kind of development is in store for the information society. All of the "ideal" network systems for providing a broad range of in-depth information have failed to live up to their initial promise, and the growth has been in stand-alone systems with packaged programs for primarily entertainment purposes. A major gap has emerged between what the information society's proponents predicted and what the real society's consumers bought.

The first cause of this disparity may be that the proselytizing about the information society has traditionally ignored the specifics of why such a society should come into being. There has been a lazy reluctance to ask who will need what kinds of information to do what, and

commentators have preferred to concentrate on pie-in-the-sky abstracts. And as the technology advanced and the hardware became available, the practical availability of diverse systems has undammed a flood of speculation about the many things that are possible and the many kinds of information that can be provided—regardless of whether anybody wants this information or not.

Among the most heralded possibilities were teleshopping and electronic banking from the comfort of your home. Yet this was typical of the propensity for the hardware to outrun the market. Engineers (social and electrical) may have thought that homemakers would be delighted at not having to leave home for any of these errands, but the homemakers themselves were not interested. Getting out is a relief from boredom for many of the homemakers who could afford the systems, and they quickly chose the pleasure of such mundane outings over the convenience of being able to do all of this by remote control.
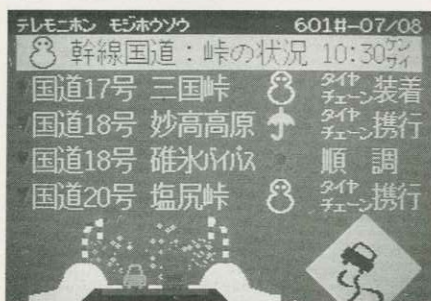
Complicated *kanji* tend to blur on CRT displays.

Another problem has been that there are still a number of unanswered questions, economically and technically, about the equipment and systems. It is often said that the new media offer expensive information to the user. The CAPTAIN system, for example, gives a movie listing of what is showing where. Yet as technical commentator Yoshiro Hoshino has calculated, it costs the CAPTAIN subscriber ¥1.6 to check a theater. By contrast, the same user could buy a copy of *Pia* magazine and get the same listing for only ¥0.05 per theater. For many people, *Pia* is the better buy.

On the technical side there are the problems of inputting and accessing data. Japanese are not used to keyboarding and there is still considerable resistance to it. A more friendly means of access is needed, but none has been developed yet. At the same time, most of the systems use CRT displays that, while fine for watching television and other pictures, are not as good for text and not nearly as good for Japanese-language text. It will not be as easy as some people have hoped to roll out the information society's new media.

Where to from here?

Given this gap between expectations and reality, what does the future hold? And this time let us rein in our fantasies and take a hard look at the likelihoods—starting with a hard look at what kinds of information the information society is supposed to provide for whom to use how and why.

The first assumption is that the wealth of information will make life more comfortable and convenient and make industry more efficient and effective. This has long been why new technology has been invented and adopted, and it is only natural that people should expect the same things of the information society.

Second, it is assumed that the easy availability of plentiful information will broaden user choice and enhance the possibilities for social participation by more people in more different forms. This is a developing trend as society matures, and it is an increasingly important need that has to be met.

Third is the enhancement of the quality of life. More than a simple matter of convenience and comfort, this entails higher levels of participation in the culture to enable people to live more rewarding lives.

Fourth is the practical impact as easier information access means more accessible and understandable personal health information, education and vocational training, asset management advice and the many other nuts-and-bolts aspects of modern living.

And fifth is the greater ease of interpersonal communication as it becomes easier to share common concerns and interests with friends, relatives and other associates near and far.

In trying to predict the future, it is important not only to identify the various purposes that information or the information society can serve but also to ask ourselves what the individual, industry and society want, how the new media can meet these needs, and whether there are not other media that could do the same jobs better.

Meeting real information needs

Looking first at industry, the information needs here are relatively simple, centering on heightened productivity and management effectiveness. Industry has been quite active in computerization and other information processing, and there is no reason to expect these needs to change now.

The first feature of industry's drive to use information better will be evident as computerization spreads from the big corporate leaders to their smaller rivals. There is already rapid growth in business INSs, primarily with telephone, facsimile and data communications and eventually with teleconferencing over high-speed digital circuits supplied by NTT. In fact, there is a booming business in packaging such circuits today as companies lease trunk lines from NTT for subdivision and sublease to smaller companies, thereby enabling the smaller firms to get the same access to digital networking technology despite their weaker financial positions.

Remote computing services are also on the increase and companies subcontract their computing work to other companies with mainframe computers. The recent increase in "smart buildings" fully wired for digital communications is another facet of this same trend as small business tenants gain access to central computing facilities. Therefore, it is expected that computer networking will no longer be the exclusive domain of the big companies but will be open to more and more firms of all shapes and sizes.

Because this offers clear and tangible benefits for companies wanting to cut their communications and information-processing costs, there is little hesitation about going to computers. Yet things are not as clear-cut when it comes to the second feature—using databases for more effective management.

Japan still lags far behind the United States in the creation and use of databases as sources of economic and other information. One reason is that Japanese are not accustomed to thinking of information as something that has to be bought and paid for, and another is that there is still a strong tendency to prefer one's own information sources to information packages put together by someone else.

However, Japanese databases have been gaining in popularity. Electronic publishing has been very much in the news over the last year or so, and most of the advances have been made with systems using CD-ROMs. Although the United States is still the leader in CD-
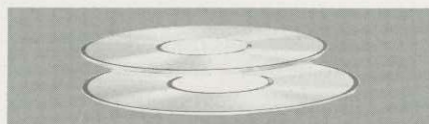
Enormous amounts of information are packed onto CD-ROMs.

ROM databases, the spread of CD equipment means that Japan is gaining fast.

The third feature is the use of artificial intelligence (AI)—specifically the use of expert systems. There has been a tremendous growth in interest in expert systems over the last two years as more and more companies move to find out how the experts do things and to program these techniques for computer-aided decision making.

Nevertheless, just because many people are trying to do it does not mean that it is easy to develop expert systems. The interest is there, but the question remains as to how practical the resultant systems will be. Still, I do not think that expert systems will be a flash-in-the-pan fascination the way so many of the new media have been. Even if only a few systems are commercialized every year, I expect this field to grow steadily stronger as new capabilities are developed and new applications found.

The combination of computers and AI has great potential significance for the information society. Not only will it enable us to indulge in more sophisticated information processing, it will also make information access friendlier and open natural-language processing possibilities. This will probably find its first applications in industry, but it should not be long before it extends to the home as well.

Bringing the information society home

Turning next to information in the home, this field has so far been dominated by VCRs, compact discs, video discs, television broadcasts and other one-way media. The question is therefore one of how much this will change and how interactive networks will become.

Some indications are already available. One is the prospect mentioned earlier that the millions of fami-con now in place will be network linked. If magnetic disc drives and facsimile capabilities are attached to what are basically video-game units, it would be easy to transform them into network terminals. In fact, disc drives have already been sold to over two million owners in the past year so that they could play more advanced games. Even if only a small percentage of these people join, it would still make a formidable network.

Once in place, this network would be expected to deal first in financial, educational and other practical information. The people doing this are not wild-eyed visionaries, and they will move cautiously

to ensure that they are providing the kinds of information their users want. And once this system is in operation, it will provide stiff competition for videotex and other new media.

While the fact that the fami-con uses a few simple function keys rather than a complete keyboard may be a limitation for ordinary computing, its promoters are trying to turn this to their advantage by playing up its ease of use in accessing data. The system's future hangs on whether or not they succeed.

Personal computer networking is another obvious candidate for bringing the information society home. At present, it is estimated that there are about 100,000 networking PC owners in Japan, but most of these are computer enthusiasts and sharp increases in this number are considered unlikely. PC use is unlikely to spread much beyond the hard core.

More than PCs, the spotlight is on word processors. Because Japanese-language word processors have developed into practical machines offering considerable capability at low cost, they are certain to come into wider use. Recently, some manufacturers have developed a very popular attachment giving word processors a communications capability. Once people are used to keyboarding from their word processors, it is a logical next step to link them up in communications networks.

Facsimile communications is another promising field. A number of manufacturers are coming out with home-market machines priced under ¥100,000, and these are gaining increasing acceptance. The question remains, of course, what the ordinary home would want a facsimile for, but some of the possibilities being suggested are to keep business executives in touch with developments at the office and to facilitate home-based educational programs—and there is always the possibility that people will come up with totally unexpected uses. If PC, word-processor and facsimile communications networks are to get off the ground, the main market impetus will have to come from new applications developed by younger users, and it will probably happen as these people enter the mainstream of adult society.

For the immediate future, the main growth is expected in an old medium—television. Large-screen (30-inch and bigger) televisions have been selling well recently, and the developmenht of HDTV will accelerate this trend in the 1990s, with all of the implications that this entails for television programming as well.

Home information networking is un-

likely to make major strides over the next few years. Then new media have yet to answer the basic questions of what kinds of information people want. I personally believe people are seeking amusement, health, education and financial success, but this is only the beginning of an answer.

Information processing in the service industries

Society is lagging behind industry in the use of information. Yet as the industrial center of gravity shifts to the service sectors, it is increasingly important that the socially involved service sector be more productive. This can only mean greater use of information processing in services and society at large.

The manifestations will be myriad, and there is already a wide range of point-of-sales (POS) systems being introduced for more efficient retail and restaurant operations. So far, services have not been as computerized and automated as factory or even office work, but they are catching up fast.

Likewise, once these things get put on line, it is reasonable to expect a greater availability of consumer information on restaurants, theaters, shopping and other services. Some videotex "town papers" are already in experimental use, and they may be expected to succeed if the information quality is there—if they offer abundant and accurate information attractively packaged. Assuming that the software can be developed, this should be possible by using video discs with videotex systems. The short-term future would seem to be in such combinations of packaged programs plus telephone communications.

Smart cards with built-in integrated circuits (called IC cards in Japan) are another potentially lucrative possibility. Like the packaged programs, these smart cards can easily take advantage of the rapid advances being made in memory technology. Financial records, health records, databases and many other applications could be put on cards for conveniently portable media. In fact, this is frequently cited as one of the most promising means of spreading the information revolution to all segments of society.

Given the great potential, it is easy to be optimistic about the future of the information society. Yet the need today is not to draw fantasy-like portraits of a utopian never-never land but to push forth in developing the necessary hardware and software for practical, specific uses. ●