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Japan

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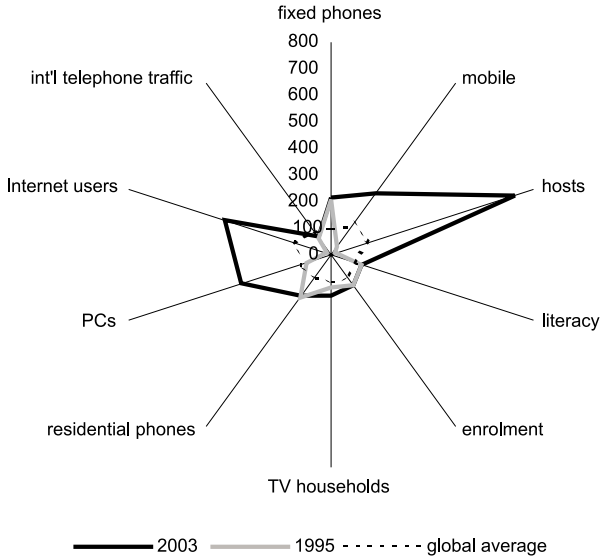

Source: *Monitoring the Digital Divide*. © Orbicom 2004

Overview

Japan may at last be emerging from more than a decade of economic stagnation. Key economic indicators for the last quarter of 2003 showed that the economy grew 1.7 percent in real terms, the highest since the late 1980s. On an annualised basis, the economy grew 7.0 percent. Growth has been driven by strong exports, a modest recovery in private consumption and stronger industrial sector investment following a period of tough corporate reforms. Private consumption increased by 0.8 percent and, according to government sources quoted when the new data were released, this increase was based on sales of flat panel televisions, DVD players and other new IT products. Annualised private sector consumption increased by 2.1 percent. Many economists agree that a full-scale recovery towards long-term growth is not yet certain, but the indicators are better than they have been for many years.[1]

Consumer confidence seemed to have steadily increased throughout 2003. Dentsu Inc., Japan's largest advertising agency, conducts an annual survey of Japan's most popular products. The results of the survey, "2003 Hit Products in Japan", released in December 2003, show that five of the ten top products were IT- or Internet-related. Dentsu's main finding was that during 2003 Japanese consumers were gaining confidence that the economy was recovering and consequently were making bolder purchases, mainly IT, digital as well as entertainment and leisure products. Dentsu considered that this trend might continue more energetically the following year and "herald a full-scale recovery in individual consumption".[2] This consumer trend is very apparent when visiting any large Tokyo electronics store. Flat panel televisions, many times more expensive than traditional cathode ray tube models, are selling well. DVD players and recorders, digital video recorders and digital media servers have pushed VCRs to the back shelves. The great increase in floor space and prominence given over to these products is one of the most noticeable changes in consumer IT retailing of the past year.

Enabling policies and regulatory environment

Japan's national ICT policy is directed by the e-Japan Strategy, which is led by the Prime Minister's Office. The strategy was created as a response to concerns that, after decades of leadership in the global IT sector, Japan was beginning to lag behind. The new strategy established the general framework and goals for a raft of "e-policies", with relevant ministries required to devise specific legislation and policy guidelines. During 2003, legislation and guidelines were introduced on a wide range of issues aimed at creating an enabling environment for e-commerce and a networked society. Legislation included new laws on digital signatures and on privacy and data protection, as well as revision of the commercial transactions law to make it compatible with the requirements of e-commerce.

In 2001, the Local Government Wide Area Network (LGWAN) began operation as one of the first projects of the e-Japan programme. The objective of LGWAN was to connect all the local governments on a secured network by March 2004. According to a survey by IDG Japan, 2,836 local governments were connected to LGWAN as of 8 January 2004. LGWAN provides a common information exchange system for all local, regional and national government departments so that they are able to share databases and a certified document exchange system. The system is making government work at all levels more efficient, but it is best known for having introduced the notorious Juki Net, the Basic Residential Registers Network System. Juki Net is essentially a national identification system that links all municipalities and prefectures so that central and local governments can share basic information on all residents: name, address, sex and date of birth. Juki Net has raised concerns over its impact on the right to privacy and the security of personal information, and the spectre of government as Big Brother scares many. A number of local,

city and prefecture governments have refused to deploy the system.

Revision of the Telecommunications Business Law

The biggest change in the regulatory environment was the revision of the Telecommunications Business Law, which oversees the business of telecommunications carriers, ISPs and other related operators. The amended law, which was enacted in June 2003, took effect in the second quarter of 2004. The previous telecommunications regime was considered to be stifling competition. The new regulations emphasize pro-competitive, market-oriented self-regulation and less reliance on government oversight.

Under the revised regulations, entry and exit barriers for the telecommunications business are lowered significantly. Carriers can begin business on a notification basis, rather than by permission or registration. The type distinction which categorised carriers according to their ownership of network facilities and service offerings was removed entirely creating a new generic class of "telecommunications carriers". The revision also allows non-dominant operators to negotiate prices directly with their customers. Complex and time-consuming equipment compliance certification processes were abolished and replaced by a manufacturer's self-compliance system.

A contentious late amendment to the law would force the incumbent Nippon Telegraph and Telephone (NTT) to allow other carriers access to its fibre network. It is common in Japan for telecommunications operators to be required to grant their competitors access to their legacy copper networks, but new networks and facilities are almost always exempt from these open access conditions. By forcing access to NTT's fibre network, the government hopes to encourage more competition and more growth in the broadband market.

Change in radio communications regulation

With the growth of the wireless communications market, the need for more efficient use of radio frequencies has become very clear. The Ministry of Public Management, Home Affairs, Posts and Telecommunications (MPHPT) has begun the process of revising the current radio communications regime. Together with its advisory councils, it has nearly completed the policy development process, and a revised radio communications bill is expected to be discussed in the 2004 session of the Japanese Diet. MPHPT has begun allocating additional spectrum for WiFi and other unlicensed technologies. In addition, it is looking to wireless communications to close the digital divide in some underserved areas in Japan.

IT policy for education

By March 2003, over 99 percent of elementary, lower secondary and upper secondary schools in Japan were connected to the Internet, well ahead of the Education Ministry's target to have all schools connected by 2005. However, these high basic connectivity figures hide problems that still must be addressed. A school can be counted as connected when just one Internet PC is present. Email accounts are not provided to children or even teachers; and while the use of the Internet is growing, it is not enough. As of 2003, 54 percent of elementary and lower secondary schools and 85 percent of upper secondary schools had their own school webpage.

Over the past few years, information identifying children, such as photographs of children's faces, has tended not to be put online out of consideration for their privacy and for fear of abduction and child molestation, which have become major social concerns in Japan. This has tended to restrict some of the more creative uses of school websites. To encourage the use of the Internet, in 2003 the Japan Elementary School Webpage Award (J-KIDS Award) was held to recognise the often underestimated efforts of teachers and students who create webpages for their schools. The inaugural award went to the Omori Elementary School in Inzai, Chiba.[3]

IT literacy officially became part of the national curriculum for senior secondary schools in the academic year starting April 2003. IT is a general-purpose technology that can be combined with almost any other school subject, and children are expected to learn IT by looking at how it can be used for a particular purpose rather than to learn IT per se. Teachers of all subjects are therefore required to have a certain level of IT literacy and be able to use those skills in class. There is a very urgent need to train teachers so that they can practically apply IT skills in their teaching.

While the teaching and learning of IT is considered important, the potential benefits of using IT in other aspects of school life seem less well understood. As mentioned, even teachers do not have a personalised email account assigned by their school, and the use of IT is not integrated with other aspects of life at school. Teachers are unable to communicate by email with students, parents or the parent-teacher association. More needs to be done to harness the power of IT for educational purposes.

Industries

Broadband

Almost 15 million subscribers, approximately 32 percent of Japanese households, have opted for broadband Internet. The average growth rate in the first half of 2004 was around 425,000 new subscribers each month and is expected to remain above 400,000 per month. The number of home fibre subscribers exceeded 1 million in February 2004, and fibre subscribers were increasing by approximately 100,000 per month. Further growth in the fibre market is expected as new provisions resulting from the revision of the telecommunications law take effect.

NTT, the incumbent telecommunications operator, is not the gross leading provider of DSL lines, and this is an important feature of the very competitive Japanese broadband market. Tariffs for copper and fibre subscriber lines are very low, and regulations ensuring that competitors can gain easy access to NTT's premises, equipment and network are enforced. It should also be noted that, unlike many other incumbents, NTT has not been obstructionist to these competitor DSL providers. The result is competition at all levels of the DSL market. Two companies, eAccess and ACCA Networks, wholesale DSL lines to other carriers and ISPs. In most other countries, wholesale is almost always only available from the incumbent. Companies like Yahoo!BB are able to build their own network from the customer's home to their equipment in the NTT exchange and over low-tariff NTT fibre to their own backbone network.

Through having end-to-end control over their networks, Yahoo!BB, eAccess and ACCA Networks are able to decide what technology to use, and this has led to competition in service offerings as well as in price. After eAccess launched a 40-Mbps service in October 2003, Yahoo!BB followed with a 45-Mbps service at the end of January 2004. Bandwidth in Japan is the cheapest in the world: in January 2004, the 40-Mbps service from eAccess cost ¥2,880 a month, the equivalent of ¥72 per megabit (US$1 = ¥103).

VoIP

During 2003, Yahoo!BB began a VoIP telephony service as a means to attract new DSL customers. In some promotions, it gave away an Internet phone unit or sold it at greatly discounted prices. Calls are free to other Yahoo!BB users, and rates for domestic and international calls are significantly cheaper than those of all traditional telephone carriers. More than 90 percent of Yahoo!BB customers signed up for its Internet phone service. Other broadband service providers are offering similar services. A survey by *Kyodo News* at the end of 2003 found that 30 (27 percent) of Japan's top 110 companies were using Internet phone services. Hitachi revealed that it had cut its annual calling expenses from ¥1.7 billion to ¥0.5 billion by using VoIP.

Mobile phones

In March 2004, there were more than 81 million mobile phone subscribers, but annual growth had slowed to just 6 million new users in 2003. However, the market is still vibrant and profitable: The number of 3G phone users reached 14.5 million, an increase of almost 9 million during 2003. More and new features were added to 2G phones, and a total of 50 million new telephone handsets were sold in 2003.

Profits are high: the NTT DoCoMo group earned a net profit of ¥494 billion on revenue of ¥3.282 trillion in the April–December period of 2003. DoCoMo's average monthly revenue per user was ¥10,210 for its 3G service and ¥8,000 for its 2G service during that period, while that of the number 2 operator, KDDI, was ¥7,490 for its 3G and 2G services in the third quarter of 2003. KDDI has by far the largest 3G subscriber base – 13.5 million customers in March 2004 – and the most sophisticated services.

Cameras are now a standard feature on mobile phones. The top telephone models have a 2-megapixel camera with digital zoom. As lens quality increases, we can expect camera phones to displace not only disposable film cameras but also low-end pocket digital cameras. These high-quality cameras are also ideal for scanning text, reading bar codes, and storing URLs as well as email addresses, giving rise to new ways to find and purchase products. GPS-enabled phones are also

Chaku Uta and the success of mobile content

Estimated to be worth US$2–$3.5 billion annually, the global ring-tone market is one of the unexpected successes of the mobile phone business. No one anticipated that these relatively low-quality music clips would become a global phenomenon. In Japan, the higher data rates of KDDI's 3G system have helped to create a new variation of the ring-tone market called Chaku Uta.

Chaku Uta ring-tones are clips of real songs by real artists that can be downloaded and saved in MP3 format on the telephone handset. The song clips are typically 45 seconds long. People use them to see if they like a new release, perhaps later purchasing the full version of the song on CD or, more often, saving the clip as a ring-tone to be played when a call is received. Different songs can be set to play when different people call or email. Songs are played as 32-Kbps streams, a very significant increase in quality over even the best polyphonic ring-tones.

Downloads cost on average ¥105–¥210 for each clip. There are currently 30,000 clips to choose from, and new songs are added as they are released. In 2003, KDDI launched a video version of the service. It operates in the same way; but instead of just the song being played when someone calls, the music video also starts to play. KDDI users downloaded 3 million 45-second songs in June 2003. Vodafone Japan launched a similar service in December 2003, and NTT DoCoMo began its service in the first half of 2004.

The total mobile phone music market in Japan in 2003, for all types of ring-tones, is estimated at ¥108.5 billion.

available, allowing real-time navigation and location search. Screens are becoming larger – the largest now is 2.4 inches – with higher pixel density; they are also thinner, brighter and lighter, besides requiring less power to run. The image quality is good enough to watch television. In fact, a mobile phone television service was launched during 2003.

DoCoMo and Sony Ericsson released a telephone with a contactless cash card using the Felica system in early 2004. Contactless cash cards are widely used for commuter rail travel, for purchases in convenience stores and by companies as employee identity cards. A standard Felica chip can store up to 40 different applications, which might be different payment systems – for train and subway travel, convenience store purchases, orders at a favourite bar, etc. – or different identity management systems. The basic standards are universal, and technically it is possible to download new applications on demand. For example, a person in Japan might download and store the Octopus "touch and go" application on his or her telephone for commuting in Hong Kong during a business trip. Radio frequency identification (RFID) capability was added, and new telephones with encrypted infrared capability were made available from early 2004, enabling secure connections and payments between the telephone and a store checkout till or an automatic kiosk, for example. Mobile phones may soon be used for identity and payment management, which may have a profound impact on the nature of the mobile phone business. Mobile phones are exhibiting the potential to be extremely disruptive to many other products and services.[4]

Open source movement

Open source software (OSS) is commonly used as the operating system for Internet servers. In 2003, it became increasingly common to find the large-scale information systems of banks and securities companies and similar institutions based on OSS. However, proprietary software still persists for desktop use. A user survey of 446 Japanese companies conducted by atmarkIT Corporation in October–November 2003 found that 11 percent of the respondents used information systems built solely on OSS and nearly 60 percent of the respondents used OSS in one way or the other.[5]

The e-Japan Strategy encourages the adoption of OSS, and the Ministry of Economy, Trade and Industry (METI) articulates three reasons for this.[6] First, OSS reduces dependency on a particular set of software, and the greater diversity brings increased security. Second, the availability of alternatives enhances effective procurement through optimal selection. And, third, OSS is expected to contribute to industry development, particularly in consumer electronics, by ensuring interoperability and innovation.

METI provides designated research grants for OSS development. In fiscal year 2003, it allocated a total of ¥1 billion in grants for R&D on operating systems, middleware, development tools and desktop infrastructure based on OSS.

METI also considers that international collaboration and cooperation is highly important in OSS development and promotion. It has been widely reported that METI, the Chinese Ministry of Information Industry and the Korean Ministry of Information and Communication will cooperate to promote OSS development and deployment. Their ultimate goal is to create alternatives for "basic software" – which in many cases means operating systems – while at the same time ensuring interoperability and innovation in a rapidly changing technological arena and developing human resources. As part of these efforts, METI provided funds to the Center of the International Cooperation for Computerization to host the Asia Open Source Software Symposium, which has been held in Thailand, Singapore and Vietnam in 2003 and 2004.

Industry initiatives are also being undertaken. In February 2004, the Japan Open Source Software Promotion Forum was founded with a membership of users, vendors and academics. The forum aims to broaden the choice of software products in the market.

Looking to the future, the open source movement in Japan has already gone through an initial boom phase, and users are now learning how to make the best use of the applications and systems developed. OSS entered the market as information systems and is commonly used in webpages, user interfaces and similar environments. It has still to penetrate deeply into the mission-critical systems that control core functions such as customer billing, inventory management and personal records. However, the distinction between these two types of systems is becoming obscured as mission-critical business systems increasingly come to rely on customisation and personalisation made available through the information system. In this sense, OSS will move into mission-critical systems sooner rather than later.

Local online content

The Digital Content Association of Japan (DCAj) forecast in June 2003 that the volume of the entire digital content market in 2003 would grow to over ¥2 trillion, with approximately 20 percent coming from Internet and mobile content. Commercial online distribution of music and video content is becoming popular, but the volume is still relatively small, particularly for non-mobile content.

Online content has grown faster in the mobile market, where content providers have stronger control over the distribution channel and content protection mechanism for video- and music-enabled mobile handsets. The billing and payment system for content can be incorporated into the mobile operator's billing process and the monthly telephone bill. The concern over "piracy" partly explains why content providers have been reluctant to make their products available in the Internet and PC market. But this concern is gradually subsiding as copyright protection mechanisms are being incorporated into online content for PCs.

With regard to piracy, peer-to-peer (P2P) file-sharing software experienced a tough time in 2003, particularly the two most popular systems, File Rogue and Winny (see sidebar on Winny). In 2002, as the result of the petition filed by major record labels, the Tokyo District Court issued an injunction against MMO Japan Ltd, the company behind the File Rogue service, for contributory violation of copyright.[7] And in December 2003, the court judged that File Rogue violated the public transmission right of the copyright holders and ordered MMO Japan to pay ¥71 million in compensation.

File Rogue is similar to the original Napster P2P service: it acts as a centralised directory of the files made available online by the File Rogue client software. File Rogue users would look up the directory listing and download what they want. Theoretically, File Rogue itself is just an intermediary between the two parties, one who makes files available online and another who downloads those files. Not surprisingly, however, a considerable number of files are taken from copyrighted works without any permission, and this led to the court case.

Trends

If the government's attempt to force open access to NTT's fibre network is successful, the resulting increase in competition will lead to further broadband growth. Open access to the higher-speed, more stable fibre network will also encourage content and service providers to offer integrated television and video, voice telephony and high-speed Internet services, rather than focusing on high-speed Internet as they do today. The near future of broadband can be as the common "pipe" carrying all forms of communication to the home.

The most significant impact of the e-Japan Strategy has been to increase the awareness and pervasiveness of ICT in society. And the concept of pervasive ICT is at the heart of a new long-term e-Japan Strategy and a new ICT paradigm known as the Ubiquitous Network. The Ubiquitous Network is an ICT environment in which users can be connected anytime and anywhere, not just from in front of the PC. Mobile phones, Bluetooth and WiFi, for example, can provide different types of mobile access to the network.

Winny, a failed dream

Winny, which is named after the popular P2P file-sharing software WinMX (the letters *N* and *Y* come after *M* and *X* in the alphabet), was developed by a researcher at the University of Tokyo to enable users to securely and anonymously share files stored on their local disks with other Winny users. Winny, with an estimated 1.85 million users, is Japan's popular equivalent of the infamous Gnutella P2P application.

The software is designed to transfer files via a "benevolent" third party that acts as a proxy in the transfer process. Because the proxy does not inform the receiving party about the origin of the file, and in many cases files are transferred via multiple proxies, the receiver of the file does not know where the file came from. Winny also encrypts the file being transferred and divides the file into smaller fragments that can be sent by multiple proxies. The Winny client software on the recipient's computer then reconstructs the complete file from the fragments. This makes it extremely difficult for anyone monitoring the network to know what types of files are being transferred and by whom. Anonymity-conscious Internet users, particularly those gathering at the massive 2channel bulletin board system, welcomed the software.

Not surprisingly, Winny was often used for sharing copyrighted works, such as commercial video game CD-ROMs and movies. At one time, it seemed that no one could stop Winny from distributing whatever information was electronically available.

However, on 10 May 2004, police arrested the developer of the Winny system on suspicion of contributory copyright infringement. Initial indications are that police had made the arrest based on evidence that the developer attempted to directly assist copyright infringement, rather than on the illegality of the software itself. All the same, this was a surprising development. Winny is neutral to the content it shares. Just as a knife manufacturer is not responsible if someone uses one of its knives to stab another person, so Winny has been regarded as just a tool for exchanging information over the Internet and not responsible for the actions of those who use it.

Some say that this is the beginning of a cat-and-mouse game between law and technology, and more advanced software of a similar kind will be released shortly. However, the arrest has clearly threatened Japan's community of P2P developers and users. Soon after news of the arrest was made public, a number of websites providing how-to's and frequently asked questions on Winny were taken down, probably for fear that they would constitute another case of copyright infringement.

The Internet was once believed to be a new frontier where existing rules and regulations did not apply, but now it is being tamed by the real-world values and systems.

Intelligent transport systems and car navigation systems with GPS links will increase the range of access further. RFID chips, smart tags and intelligent sensors will enable interaction beyond person-to-person communication, allowing person-to-object and object-to-object connections (such as between a carton of milk and the refrigerator to indicate that the sell-by date has passed, or between a passenger car and a truck in a collision avoidance system). The Ubiquitous Network Society has become the long-term vision of Japan's ICT policy and is expected to mature over the next few years.[8]

Notes

1. Economic statistics can be found at *http://www.esri.cao.go.jp/en/sna/menu.html*.
2. Dentsu Inc. Center for Consumer Studies, 9 December 2003, *http://www.dentsu.com/media/flash/hitProducts_2003.pdf*.
3. Omori Elementary School, *http://academic2.plala.or.jp/omori* (in Japanese).
4. The most comprehensive and current description of the Japanese mobile phone market and its future disruptive trends is *Mobile Disruption: The Technologies and Applications That Are Driving the Mobile Internet* by J.L. Funk (Hoboken, NJ: Wiley, 2003).
5. See *http://www.atmarkit.co.jp/flinux/index/indexfiles/index-linux.html* (in Japanese).
6. Open Source Software Policy in Japan, *http://www.meti.go.jp/english/information/data/IT-policy/oss1.htm*.
7. File Rouge Inc. and MMO Japan Ltd, *http://www.filerogue.net* (in Japanese).
8. The Ubiquitous Network Society is discussed in the paper "Establishing the Ubiquitous Network Environment in Japan: From e-Japan to U-Japan" by T. Murakami, 1 July 2003, *http://www.nri.co.jp/english/opinion/papers/index.html*. Information about e-Japan Strategy II is available from the Prime Minister's Office, *http://www.kantei.go.jp/foreign/policy_e.html*.