

MARKET STUDY ON THE INFORMATION TECHNOLOGY SECTOR IN JAPAN

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Introduction

The Japanese Information and Communication Technology market is just 'immense' in many aspects: very large in volume, advanced in up-to-date technical applications, excited due to great realizations of what is still wishful thinking in other countries, and yet full of opportunities.

In this market study, we have compared the goals and the present situation among the main IT countries in the world: the EU, the US and Japan. Global e-commerce and e-governance, both private and public, via broadband, mobile, wireless and ubiquitous Internet access are main themes. Japan seems to lead in various fields, in particular the infrastructure for ubiquitous networking.

Japan is a Mecca for all kind of hardware, computer tools, software and services. Everything is available almost everywhere and for everyone, and most Japanese, both young and old, can afford to purchase them. Japan is also ahead when it comes to applying new techniques, resulting in products available in good quality at affordable prices for everyone. No wonder, notebook computers, cell phones, broadband, DVD-HDD recorders, etc. are very common.

Since a few years, Japan tends to import more hardware and software. One of the reasons is the production shift of major Japanese manufacturers and software houses to Asian countries, where labour is cheap. However, when quality, delivery terms and prices are met, Japan is always prepared for negotiations and thanks to recent deregulations and changes in modern management, foreign companies can compete at almost the same level as Japanese companies.

The advanced IT world covers the EU, Japan and the US. Each of them has its specialties, however, in Japan IT is more global and universally advanced, e.g. the number of Internet subscribers via cell phones has surpassed 81 million in 2006! Broadband telephone services are available for the big public. 14 million Tokyo inhabitants are using Smart cards for their daily commuter train ticket. You got lost or do not know how to get to a certain place? Do not worry, cell phones equipped with built-in camera and GPS (Global Position System) can receive and send maps with the location, and on top of it, simultaneously, a picture of the building or a landmark taken with the same cell phone.

1. Definition of the Market

1.1. Definition of Information and Communication Technology

This is the technology, where various type of data such as text, sound, graphics and moving pictures, are processed interactively by means of a mechanical processor (computer) into relevant and significant information for a specific application.

The information obtained from the processed data can be stored and communicated, mostly digitally (text, sound, graphics), via various media (telecommunications, Internet and broadcasting systems), to interactive devices (telephones in the case of telecommunications, PCs by using the Internet, TV and radio in the case of broadcasting), where we can get access to this information and interact with it.

1.2. Definition of Sector

In general, the market for information and communication technologies embraces and comprises the necessary hardware, software and service systems to build, manage and run the information communication on.

More specifically, it comprises the following:

1. Software: operating systems, application software, etc.
2. Hardware: PCs, servers, PDAs, mobile phones, etc.
3. Services

Since not all segments can be covered in the frame of this study, the recent, most relevant and significant items will be introduced, presented and commented, where possible.

2. The IT situation in Japan and the EU

2.1. The status in the EU

2.1.1. Where is Europe Now?

Convergence is relatively new, so this is a young industrial sector. Europe is not badly placed, with one of the world's most vibrant communications industries and world-class content producers.

Europe's IT sector, however, has fewer 'big hitters' than the US or Asia. Most European content producers, moreover, are divided by culture and language into national industries, with fewer companies on the scale of the US conglomerates which have emerged from America's huge single market.

On the other hand, the above could have been said about Europe's mobile communications sector in the 1980s. Yet today, Europe leads the world in this sector, with many of the world's largest equipment suppliers, mobile phone companies and mobile content producers. This success stems from a concerted, coordinated EU-wide push by the European Commission, national governments and industry in the interrelated fields of research and development, standardisation and regulation: GSM was born.

Today, the goal is to translate Europe's strengths into a strong position in the global Information Society industry. It is a far more complex challenge, but the stakes are nothing less than European competitiveness and prosperity in the 21st century.

(Source: Europe's Information Society, Thematic Portal)

2.1.2. What are the priorities in the EU today?

- Creating a stable regulatory framework that provides certainty to investors, which stimulates innovation and increases competition and consumer choice
- Promotion of content, including new services and applications. This will be the key to persuade Internet users to take up broadband and move to the next generation of mobile communications devices. A major role can be played by e-Government here.
- Meet the needs of consumers and businesses for security and confidence in cyberspace
- Supporting research and development to ensure European mastery of key ICT technologies
- Supporting the widespread take-up of ICT, both stimulating growth and bringing the benefits to all citizens and businesses

2.1.3. The e-Government in the EU: e-Europe 2002/2005 and i2010

“To make e-Government a success, inclusiveness is an important factor: Governments cannot choose their customers: they have to serve every citizen equally. They will have to pay special attention to avoiding the creation of a digital gap while implementing e-Government. e-Government can create discrepancies among citizens, but at the same time, it is a powerful way of implementing good governance, namely public services that respect openness, participation, accountability, effectiveness and coherence.”

(Source: (1) based upon the articles: "Electronic Europe Is Doing Fine But Needs New Impetus" by Erkki Liikanen and "EU Aims to Match U.S. in Information Technology", by Piaa-Noora Kauppi, Trends in Information Technology, European Affairs)

An overview of the initiatives taken in the past years:

- 1) e-Europe 2002: EU member states seek to promote inexpensive high-speed and safe Internet access services by the year 2002.
- 2) e-Europe 2005: EU member states seek to attain the spread of broadband infrastructure and the development of broadband services, applications and contents by 2005.
- 3) "i2010: A European Information Society for growth and employment" to foster growth and jobs in the information society and media industries (<http://europa.eu.int/i2010/>).
- 4) eTEN: a European Community Programme designed to help deployment of telecommunication network based services (e-services) with a trans-European dimension. It focuses strongly on public services, particularly in areas where Europe has a competitive advantage.

2.1.4. Latest IT innovation policies of major European countries

e-Projects were launched in many countries in the past years. The European Commission's eGovernment Observatory (<http://ec.europa.eu/idabc/en/chapter/140>) keeps track of all the latest developments in this area. Below is a short overview of the latest innovation policies.

Belgium: Single virtual public administration

- Main objectives are to improve public service delivery for citizens and businesses by making it faster, more convenient, less constraining and more open.

Czech Republic: e-Czech 2006

- The "State Information and Communications Policy (e-Czech 2006)" was published in 2004. It identifies three priority areas for action: e-government services, e-procurement and e-health.



Denmark: e-Government Strategy 2004-2006

- Digitalisation must contribute to the creation of an efficient and coherent public sector with a high quality of service, with citizens and businesses in the centre. By the end of 2006, at least 60% of citizens and 95% of businesses should use e-government services, and the level of user satisfaction with such services should increase.

Estonia: "the Citizen's IT Center"

- The Estonian Government unveiled in March 2003 an ambitious e-government portal, providing a single, one-stop umbrella for the many government services already online and for all new services being developed. The site enables citizens and businesses to digitally sign government forms, such as e.g. passport applications.
- "Principles of the Estonian Information Policy 2004–2006" was approved in spring 2004. The new policy aims to strengthen the central co-ordination and increase consistency and collaboration in developing the information society. It follows the objectives set out in the eEurope 2005 action plan and other strategic documents in Europe.

France: ADELE and RE/SO 2007

- RE/SO 2007: The French Government, has with their plan "Reso 2007", announced the objective of 10 million ADSL users by 2007.
- ADELE 2004-2007: "To make your life easier": providing the French public with a single electronic entry-point to all government services, as well as providing a framework for unifying government and other public services.

Germany: BundOnline 2005

- Germany's Chancellor launched the largest federal e-government initiative: BundOnline 2005, which allows federal employees, citizens and the business community to access services across the country.

Hungary: eKormanyzat Strategia 2005

- This strategy establishes that the Hungarian system of public administration, public services and the administration of justice should operate on the basis of modern principles, focusing upon the needs and requirements of citizens. This should result in better quality services and a more sensible use of available resources.

Latvia: e-Government Action Programme 2005-2009

Basic action lines:

- to improve state and municipal information technology infrastructure
- to create new channels for government services based on the one-stop agency principle
- to develop new e-services – primarily the most required by citizens and business
- to improve the quality of public services using ICT solutions
- to create new state information systems and to develop municipalities' information systems

Luxembourg: eLuxembourg Action Plan 2001 and e-Government Master Plan 2005

e-Government Master Plan: aimed at accelerating e-government progress in the country.

Strategic objectives of “e-governance”:

- government transparency
- citizen inclusion and participation
- public sector efficiency
- increased competitiveness of both the public and private sectors
- increase of the general level of knowledge and know-how in Luxembourg.

Poland: ePoland - A Strategy for the development of the Information Society in Poland 2005-2006

Main objectives:

- 1) provide affordable, fast, and secure Internet access to all citizens and businesses
- 2) to develop a broad and valuable range of online content and services
- 3) promote ICT literacy across the country

Portugal: LigarPortugal ('ConnectPortugal') 2005 - 2009

- Aims to create a transparent, modern and efficient public administration
- Policy priorities: increase the use of open source software by public sector bodies, generalising the use of Voice over Internet Protocol (VoIP) telephony, providing ICT training to every civil servant, and creating a central e-procurement website to advertise all public calls for tender of both central government and local authorities.
- All 'basic' public services should be available online and free-of-charge by 2009
- Part of the Portuguese Government's Technological Plan to promote the development of the Portuguese information society and improve the country's competitiveness, commonly called the 'Technological Shock'

Sweden: 24-hour Public Administration

- Public information and services should, as far as possible, be available electronically 24 hours a day seven days a week
- An important aim is also to strengthen democracy by enhanced transparency and citizen participation in the policy-making and decision-making processes

UK: UK Online 2000-2005

- e-Government Unit: “ensuring that IT supports the business transformation of Government itself so that we can provide better, more efficient, public services.”
- Transformational Government: ‘Transformational Government – Enabled by Technology’ was published in November 2005. The strategy set out how effective use of technology to deliver services designed around the needs of citizens and businesses can make a real difference to people’s lives. This implementation plan describes the actions taken since publication and the tasks to be completed by July 2007.
- DirectGov: Directgov is the Government’s flagship digital service, delivered through the Directgov website and digital television. Directgov offers a wide range of government information and services online.

2.2. The information and communication policy in Japan: u-Japan Concept

Major Objective of u-Japan: To become a leading ICT nation by 2010.

2.2.1. Building a Ubiquitous Network Society That Spreads Throughout the World

The White Paper 2004, titled “Information and Communications in Japan”, published by the Ministry of Internal Affairs and Communications (MIC), indicates a number of trends, objectives and strategies.

The purpose of the White Paper 2004, titled “Building a Ubiquitous Network Society That Spreads Throughout the World” builds on top of that and can be summarised as follows:

- To give continued impetus to the information and communications technology (IT) to reach the planned goals of 2000 in time. These goals can be summarized as: the promotion of economic structural reform and enhancement of the international competitiveness industry, the realisation of a national life that evokes feelings of comfort and affluence in terms of people’s lives, and the enhancement of convenience for the people as well as the simplification and improvement in the efficiency and transparency of administrative management.
- To accelerate the IT revolution to facilitate and accomplish substantial progress with the e-Japan Strategy

- To promote not only e-commerce but also e-government and e-municipalities
- To be careful: "[...] it is necessary for Japan to undertake active measures that will ensure information security and resolve various outstanding issues including bridging the digital divide"

As outlined in Chapter 3, the Japanese telecommunication market has seen a tremendous growth in the past years thanks to market deregulation laws. Japan's government is continuously taking steps to further promote competition. A study group set up in October 2005 by the MIC is scheduled to publish their guidelines in a paper "New Competition Promotion Program 2010". It will outline a framework for new competition rules to address the transition to IP based networks. Below is a preview of the new competition model.

Main regulation differences:

- Abolition of the old-style Type-1 (= typical phone carriers) and Type-2 (= mainly Internet access providers) business categories (2004)
- Establishment of the Telecommunications Business Dispute Settlement Committee (2001)
- Abolition of tariff regulations ("detariff")
- Old rules were mainly focused on regulating the market dominance of key players

Basic Principles for Competition Rules

- 1) Fair competition at communication layer (fair horizontal competition)
- 2) Fair competition across layers (fair vertical competition)
- 3) Competitive neutrality and technological neutrality
- 4) Consumer protection
- 5) Flexibility, transparency and consistency of competition rules (to ensure policy predictability)

Competition Rules - from "legacy model" based on PSTN to "new model" based on IP based networks

Targeting early 2010s - a "milestone"

- 1) IT new strategy (decided in January 2006) sets the year 2010 as the time to make broadband services available for every community.
- 2) Major telecom carriers shift their networks to IP based networks (change from "sub" networks to "main" networks in early 2010s)
- 3) Many business models to converge between telecommunications and broadcasting (ex. IP multicast) - may take place in early 2010s

The proposed framework contains a range of very specific steps:

- Review of Dominant Regulations (“competition safeguard system” to be started from FY 2007)
- Establishment of interconnection rules for Next Generation Networks (NGNs) developed by NTT (rules to be developed aiming at the latter part of FY 2007, when NTT E/W are planning to launch commercial service using NGNs)
- Review of Access Charge Calculation Methodology (to be concluded by the end of 2007)
- Review of Interconnection Accounting System (to be concluded by summer 2007)
- Facilitation of market entry by Mobile Virtual Network Operators (“MVNO business guideline” to be revised by the end of 2006)
- Improvement of Dispute Settlement Mechanism
- Review of Mobile Terminal Business (SIM locking, sales incentives, etc.)
- Review of the Numbering System in response to IP based networks

2.3. IT worldwide and in Japan

2.3.1. Internet Penetration around the World

Data collected by InternetWorldStats.com on the Internet penetration rates (percentage of population having Internet access) around the world shows that in the European Union, the Internet penetration is highest in Sweden and Portugal with 74.9% and 74.1% respectively. The rate reached 67.2% in Japan, a situation comparable to Luxembourg and The Netherlands

Top 20 Countries with the highest Internet penetration rate

#	Country or Region	Penetration (% Population)	Internet Users Latest Data	Population (2006 Est.)	Source and Date of Latest Data
1.	1 Iceland	86.8%	258,000	297,072	ITU - Sept/06
	2 New Zealand	76.3%	3,200,000	4,195,729	ITU - Sept/05
	3 Sweden	74.9%	6,800,000	9,076,757	ITU - Sept/06
	4 Portugal	74.1%	7,782,760	10,501,051	IWS - Sept/06
	5 Australia	70.7%	14,663,622	20,750,052	Nielsen//NR - Aug/06
	6 Falkland Islands	70.4%	1,900	2,699	CIA - Dec/02
	7 Denmark	69.4%	3,762,500	5,425,373	ITU - Sept/05
	8 United States	69.3%	207,161,706	299,093,237	Nielsen//NR - Aug/06
	9 Hong Kong (China)	69.2%	4,878,713	7,054,867	Nielsen//NR - Feb/05
	10 Luxembourg	68.6%	315,000	459,393	ITU - Sept/06
	11 Switzerland	68.1%	5,097,822	7,488,533	Nielsen//NR - Aug/06
	12 Canada	67.9%	21,900,000	32,251,238	eTForecasts Dec/05
	13 Norway	67.8%	3,140,000	4,632,911	C+I+A - Mar/05
	14 Singapore	67.2%	2,421,800	3,601,745	ITU - Sept/05
	15 Japan	67.2%	86,300,000	128,389,000	eTForecast Dec/05
	16 Korea, South	67.0%	33,900,000	50,633,265	eTForecast Dec/05
	17 Greenland	66.5%	38,000	57,185	ITU - Sept/05
	18 Faroe Islands	66.5%	33,000	49,598	ITU - Sept/06
	19 Netherlands	65.9%	10,806,328	16,386,216	Nielsen//NR - Jun/04
	20 United Kingdom	62.5%	37,600,000	60,139,274	ITU - Sept/06
	Rest of the World	9.7%	556,042,545	5,705,445,123	IWS - Sept/06
	World Total Users	16.7%	1,086,250,903	6,499,697,060	IWS - Sept/06

Exhibit

Source: <http://www.internetworldstats.com/>

Except for Estonia, Latvia and Slovenia, most Eastern European countries are still lagging behind, far under the average for the European Union of 51.9%.

Internet Usage in the European Union

Exhibit 2.

EUROPEAN UNION	Population (2006 Est.)	Internet Users, Latest Data	Penetration (% Population)	Usage % in EU	User Growth (2000-2006)
Austria	8,188,806	4,650,000	56.8%	1.9%	121.4%
Belgium	10,481,831	5,100,000	48.7%	2.1%	155.0%
Cyprus	961,154	298,000	31.0%	0.1%	148.3%
Czech Republic	10,211,609	5,100,000	49.9%	2.1%	410.0%
Denmark	5,425,373	3,762,500	69.4%	1.6%	92.9%
Estonia	1,339,157	690,000	51.5%	0.3%	88.2%
Finland	5,260,970	3,286,000	62.5%	1.4%	70.5%
France	61,004,840	29,521,451	48.4%	12.3%	247.3%
Germany	82,515,988	50,616,207	61.3%	21.1%	110.9%
Greece	11,275,420	3,800,000	33.7%	1.6%	280.0%
Hungary	10,060,684	3,050,000	30.3%	1.3%	326.6%
Ireland	4,065,631	2,060,000	50.7%	0.9%	162.8%
Italy	59,115,261	28,870,000	48.8%	12.0%	118.7%
Latvia	2,293,246	1,030,000	44.9%	0.4%	586.7%
Lithuania	3,416,941	1,221,700	35.8%	0.5%	443.0%
Luxembourg	459,393	315,000	68.6%	0.1%	215.0%
Malta	385,308	127,200	33.0%	0.1%	218.0%
Netherlands	16,386,216	10,806,328	65.9%	4.5%	177.1%
Poland	38,115,814	10,600,000	27.8%	4.4%	278.6%
Portugal	10,501,051	7,782,760	74.1%	3.2%	211.3%
Slovakia	5,379,455	2,500,000	46.5%	1.0%	284.6%
Slovenia	1,959,872	1,090,000	55.6%	0.5%	263.3%
Spain	44,351,186	19,204,771	43.3%	8.0%	256.4%
Sweden	9,076,757	6,800,000	74.9%	2.8%	68.0%
United Kingdom	60,139,274	37,600,000	62.5%	15.7%	144.2%
European Union	462,371,237	239,881,917	51.9%	100.0%	157.5%

- NOTES:
- (1) The European Union Internet Statistics were updated on Sept. 18, 2006.
 - (2) Population is based on data contained in world-gazetteer.com.
 - (3) The usage numbers come from various sources, mainly from data published by Nielsen//NetRatings , ITU , C-I-A, local NICs and private sources.
 - (4) Data may be cited, giving due credit and establishing an active link to Internet World Stats .
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Source: <http://www.internetworldstats.com/>

In each country the number of Internet users has been increasing at a remarkable pace. Exhibit 3 shows that the number of Internet users in the world was over 1 billion as of September 2006. There were 394.9 million users in Asia (mostly China, Japan and India), followed by Europe (308.8 million users) and North America (229.1 million users).



World Internet usage and population statistics

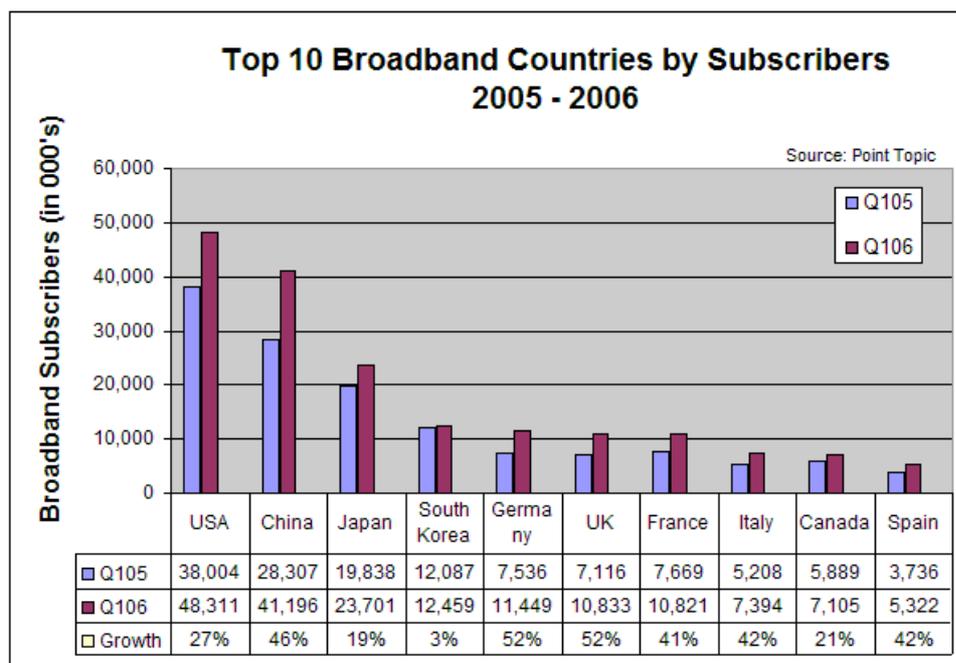
World Regions	Population (2006 Est.)	Population % of World	Internet Usage, Latest Data	% Population (Penetration)	Usage % of World	Usage Growth 2000-2006
Africa	915,210,928	14.1%	32,765,700	3.6%	3.0%	625.8%
Asia	3,667,774,066	56.4%	394,872,213	10.8%	36.4%	245.5%
Europe	807,289,020	12.4%	308,712,903	38.2%	28.4%	193.7%
Middle East	190,084,161	2.9%	19,028,400	10.0%	1.8%	479.3%
North America	331,473,276	5.1%	229,138,706	69.1%	21.1%	112.0%
Latin America/Caribbean	553,908,632	8.5%	83,368,209	15.1%	7.7%	361.4%
Oceania / Australia	33,956,977	0.5%	18,364,772	54.1%	1.7%	141.0%
WORLD TOTAL	6,499,697,060	100.0%	1,086,250,903	16.7%	100.0%	200.9%

- NOTES:
- (1) Internet Usage and World Population Statistics were updated for Sept. 18, 2006.
 - (2) Demographic (Population) numbers are based on data contained in the world-gazetteer website.
 - (3) Internet usage information comes from data published by Nielsen//NetRatings, by the International Telecommunications Union, by local NICs, and other other reliable sources.
 - (4) For definitions, disclaimer, and navigation help, see the Site Surfing Guide.
 - (5) Information from this site may be cited, giving due credit and establishing an active link back to www.internetworldstats.com.
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Exhibit 3.

2.3.2. Broadband Access Penetration Around the World

The movement towards broadband Internet connections has been progressing rapidly in many countries. In the United States, the number of broadband contracts has exceeded 48.3 million users. In Asia, particularly in China, Japan (23.7 million) and South Korea, the development of broadband has been remarkable. China, with 41.2 million broadband users, is expected to keep the top position in the years to come. Europe as a whole has seen a relatively slow growth in the



number of broadband contracts in the past but has started to gear up: more than 10 million users in Germany, France and the UK, 7.4 million in Italy and 5.3 million in Spain.

Exhibit 4.

Source: Point Topic, <http://www.websiteoptimization.com/>

2.3.3. Internet connections through cell phones

Japan is by far the largest provider in the world of Internet connection services via cell phones, referred to as the “Mobile Internet”. The number of subscribers has surpassed 81.3 million as of August 2006 and as such Japan can be considered to be by far the world leader in Mobile Internet. 87.8% of the total numbers of subscribers to cell phones are Mobile Internet subscribers. This is remarkably high in comparison with other major countries.

Jpn. Mobile Data Users	
i-Mode	47,089,300
EZ-Web	21,328,600
V-live!	12,928,200
Total	81,346,100
Customers by Carrier	
DoCoMo	51,976,600
KDDI/au	24,173,800
Vodafone	15,283,600
Willcom	4,190,100
Total	95,624,100
31 August 2006	

Source:
Wireless Watch Japan

Exhibit 5.

Conclusion:

For a sharp eye, there are a lot of hidden opportunities as there is still a lot to do for the appropriate utilization of IT in the areas of business, public administration, everyday life, the distribution of appealing Web content and the maintenance of information security. The promotion of new services and technological development, which are cross-sectional themes in the development of IT utilization also offer opportunities. In this environment, there could be some niche markets for small and medium sized European companies that have advanced techniques and know-how in particular market segments.

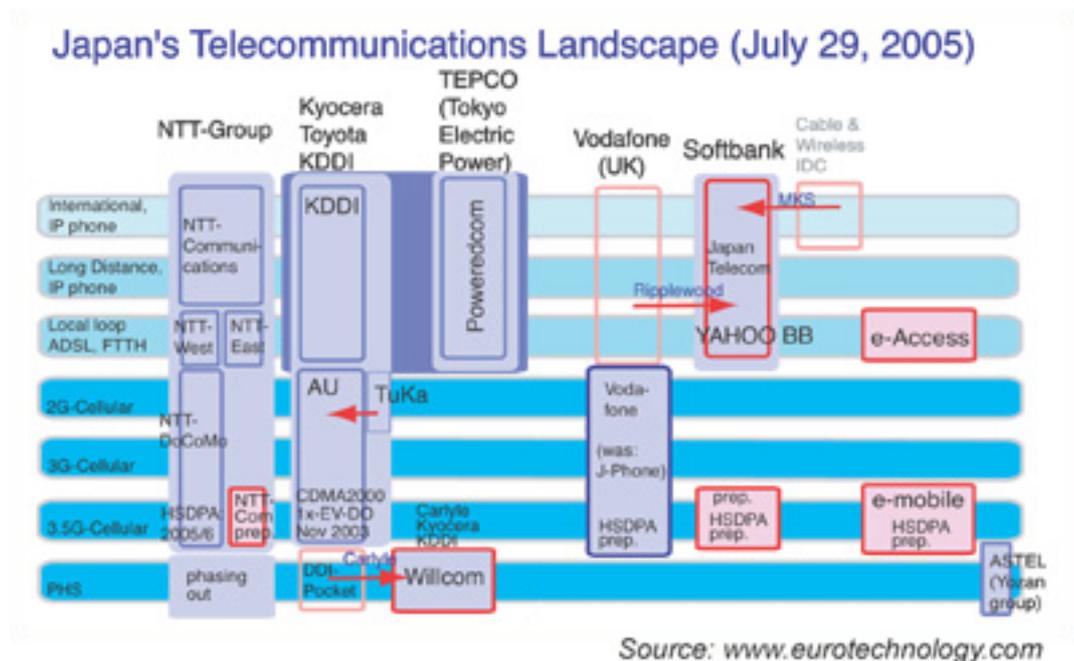
3. The Communication Technologies in Japan

3.1. Telecommunications Carriers

There were 13,090 telecommunications carriers in Japan at the end of fiscal 2004. Operators providing Internet services totaled 9,111 at the end of fiscal 2004 (a 2.8% increase over the previous fiscal year).

Exhibit 6.

In Japan, three major carriers have been controlling the mobile phone communications in the past years: NTT Docomo, KDDI and Britain's Vodafone Group.



On November 10 2005, Japan's communications ministry granted eAccess one of three new cellular licenses, opening the market to the country's first new entrants in a dozen years. The other licenses went to data transmission operator IPMobile and Softbank.

Rather unexpectedly, in early 2006 the Vodafone Group decided to sell off its Japanese unit to Softbank. Only a few years after completely rebranding from J-Phone, the Vodafone users now see their communication company change its name into Softbank Mobile.



Also eAccess is preparing the launch of a range of new communication services so competition in the Japanese mobile phone market is expected to heat up considerably in the next 6 to 18 months.



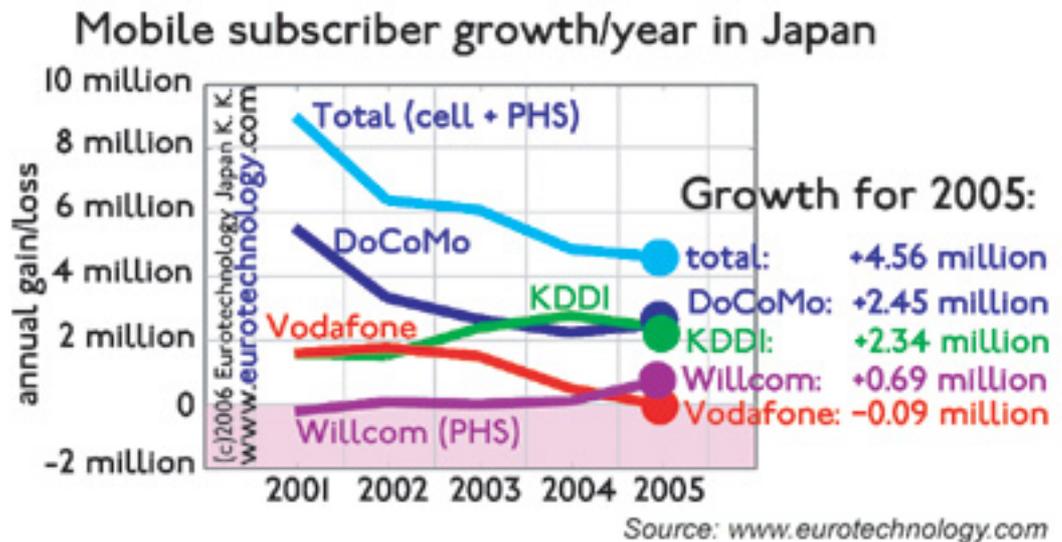
Willcom, originally "DDI Pocket" and part of the KDDI Group until the Carlyle Group took control, has seen its turn-around continuing. The subscriber growth numbers show it to be consistently gaining market share.

Exhibit 7.

On the other hand, NTT East/West is still dominating the fixed telephone line business.

However,

several utility companies as well as pretty much all Internet Service Providers have entered the market place and are offering cheaper IP-phone based connections, usually in combination with broadband Internet access subscriptions.



3.2. Telecommunications Services

3.2.1. Fixed vs. mobile phone lines

Telecommunication services in Japan have become gradually more diversified, with flat-fee broadband internet amongst the most popular services.

Some numbers:

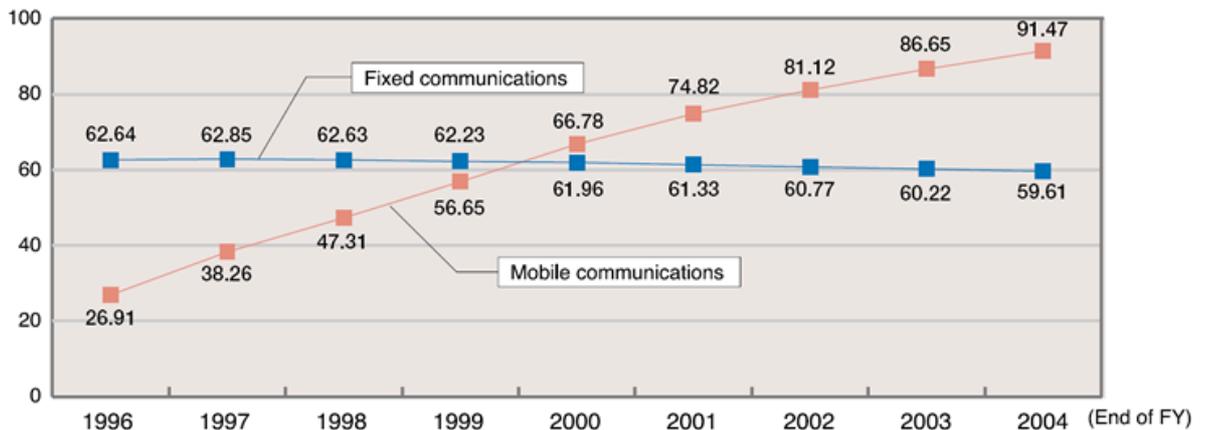
- Calls between fixed communications terminals declined to 59.5% in fiscal year 2000.
- In December 2004, the number of cell phone subscriptions reached 91.47 million.
- The number of fixed-line telephones dropped from 60.22 million to 59.61 million in fiscal year 2004, again a 1% decline from the previous fiscal year.

These figures indicate not only a rapid shift from voice communication via fixed telephone lines to mobile communication but also increased data traffic and Internet surfing.

Exhibit 8.

Transition in the number of subscribers to fixed communications and mobile communications

(in millions of subscribers)



Note: The percentages in brackets indicate changes over the previous year.

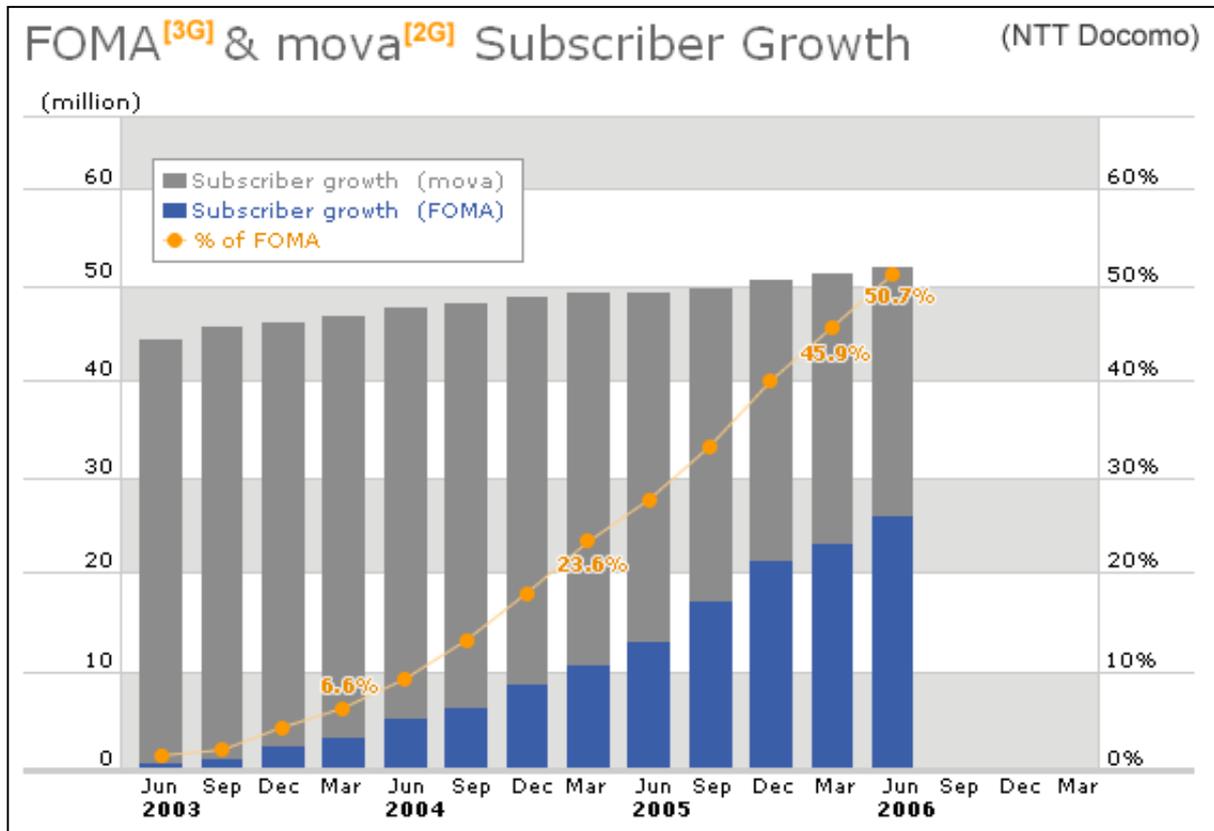
Source: White Paper 2005, Information & Communications in Japan

3.2.2. Mobile phones: PHS, PDC/2G, 3G and 3.5G

- The number of mobile phone subscribers at the end of August 2006 reached 95.6 million.
- There are over 56 million 3G subscribers in Japan (August 2006) and the number has been growing at a rate of over 1 million per month since January 2004.
- All carriers introduced simplified handsets that target the elderly, aiming for further growth in their user base.
- Docomo's FOMA 3G service offers data rates of up to 384 kbps (download) while Au's network offers a maximum data reception speed of 2.4 Mbps.
- In the Summer of 2006, Docomo launched a new "High-Speed" service with a download performance of up to 3.6 Mbps. So far only in the Tokyo Metropolitan areas but other regions are expected to follow soon.

Although NTT DoCoMo offered the world's first 3G services in late 2001, KDDI has been the dominant force in the 3G market for several years. By September 2003, KDDI reached a milestone of 10 million subscribers, while NTT DoCoMo languished behind, finally reaching one million subscribers by October 2003. Since then, NTT Docomo has seen a dramatic subscriber shift from its old mova 2G network to their FOMA 3G services. The third player in the Japanese 3G market, Vodafone (Softbank Mobile since October 1, 2006), could only convince 4,34 million of its subscribers to switch to W-CDMA handsets by August 2006.

Exhibit 9.



Every month, approximately 1.5 million users are switching from the old 2G network to 3G. By the end of August 2006, Japan had around 95.6 million mobile subscribers, with over 51.5 million subscribers signed up for 3G services.

3.2.3. 4th Generation mobile phones (4G)

At present the download speed for mobile Internet connections in Japan is between 9.6 kbit/s for 2G mobile phones, up to 256 kbit/s for Personal Handyphone Systems (PHS), typically 200 kbit/s (nominally 384 kbps) for DoCoMo and Vodafone 3G mobile phones, 2.4 Mbps for AU's CDMA2000-1x-WIN service and 3.6 Mbps for Docomo's new "High Speed" packet data communication service.

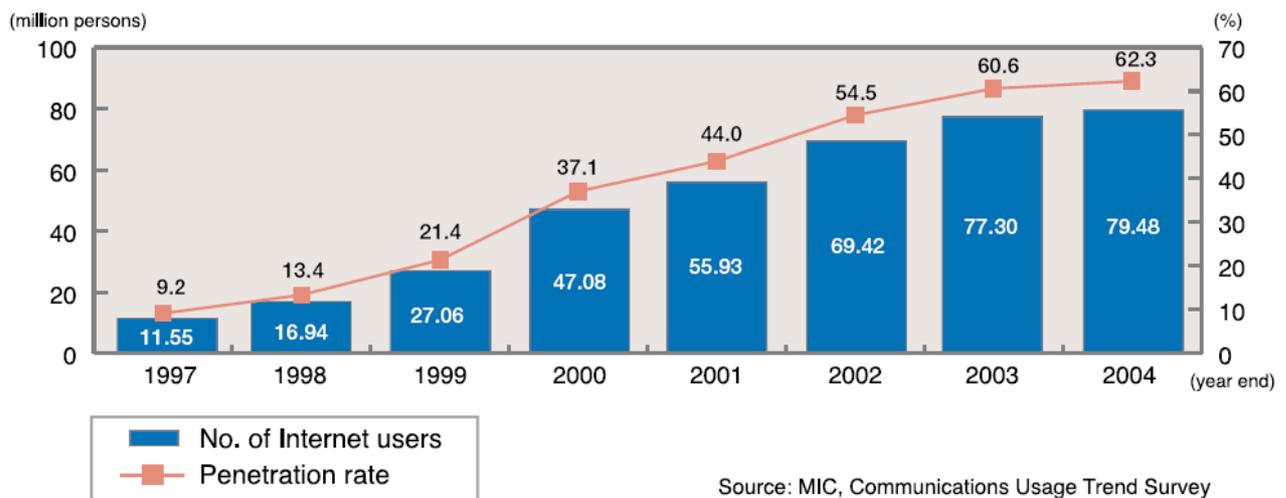
- Target launch: Around 2010 (set by the telecommunications council of Japan's Ministry of Internal Affairs and Communications)
- Target speeds: max. 100 Mbps in high-mobility and max. 1 Gbps in low-mobility
- Status: 05.2005 outdoor trial achieved 1 Gbps downlink to slow-moving receiver

3.3. The Internet in Japan

3.3.1. Internet Penetration Rate

Exhibit 10.

Number of Internet users and penetration rate



Users:

- The number of Internet users in Japan at the end of 2004 stood at 79.48 million, according to figures released by the Ministry of Internal Affairs and Communications.
- The penetration rate for households exceeded 62%, which means a rapid increase of Internet usage in homes in the past 5 years. The penetration rate in enterprises was more than 98%. From the above we can conclude that there is a steady on-going penetration of the Internet.
- Although many people access the Internet via PCs either at home and /or at work, more than 60 million people are accessing the Internet via cell phones, Personal Handyphone Systems (PHS) and Personal Digital Assistants (PDA) with a wireless connection.

3.3.2. Broadband Internet Access: xDSL, CATV and FTTH

Since 2000, continuous efforts have been made to promote DSL (Digital Subscriber Line), CATV (Cable Television), FTTH (Fibre-to-the-Home) and other broadband networks in Japan. Broadband access services at fixed fees have become the main Internet connections for home use.

The Softbank Group launched its Yahoo-BB (Yahoo Broadband) service in September 2001, offering always-on 8 Mbps and 12 Mbps services at half of the market price of their direct competitors. The competition among providers intensified and prices further decreased. Nowadays,

the combined circuit fees and Internet access fees for flat-fee Internet access have fallen to a level lower than in other countries while connection speeds have gone up tremendously.

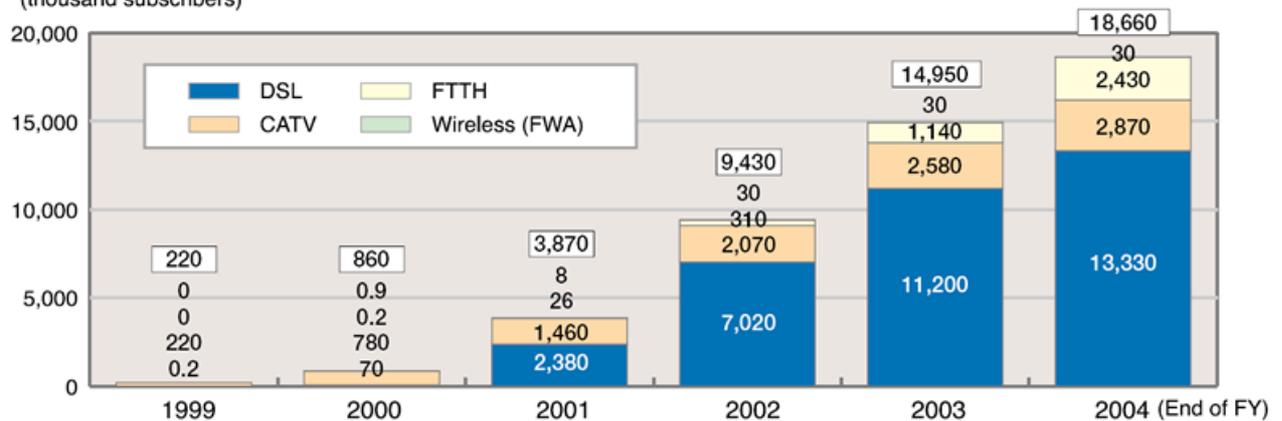
With the always-on access of broadband, users are able to access high-bandwidth content, such as full-motion video images, application software, motion pictures and music, without worrying about the online duration - this results in more usage of the Internet.

At the end of 2004, the situation was that broadband subscriptions rose to 18.66 million, a dramatic increase from the figures of the previous years. In particular, DSL subscriptions (currently from 1 Mbps up to 50 Mbps) reached 13.33 million. Cable Internet subscriptions (usually 8 Mbps up to 30 Mbps) amounted to 2.78 million. The strongest growth is noted for FTTH (Fibre to the Home) subscribers with 2.43 million subscriptions (+177% compared to 2003). The number of high-speed fixed wireless access subscriptions stayed stable at around 30,000 at the end of fiscal year 2004.

Exhibit 11.

Transition in the number of broadband subscribers

(thousand subscribers)



Notes:

The values for 2004 are those as of the end of December.

Broadband: Total for FTTH, DSL, cable Internet, and wireless (FWA)

3.3.3. Mobile Internet: i-mode, Vodafone Live!, EZweb, etc

Japan is by far the largest provider in the world of Internet connection services via cell phones or “Mobile Internet”. As of August 2006, the number of I-mode subscribers has reached 47 million. Mobile Internet subscribers account for 85% of the total number of subscribers to cell phones, which is extremely high compared to other countries.

Jpn. Mobile Data Users	
i-Mode	47,089,300
EZ-Web	21,328,600
V-live!	12,928,200
Total	81,346,100
31 August 2006	

Exhibit 12.

Source:
Wireless Watch Japan

Purpose for using Mobile Internet is access to diversified contents like:

1. News, information, education and entertainment
2. Purchasing of tickets: train, flights, cinema, concerts, etc.
3. Financial transactions
4. Downloading of music
5. Advanced moving image services
6. Navigation services

Example to illustrate how young people are integrating cell phones into their lives:



Yuka Ito, age 17

It's seven a.m. A movie theme song starts playing on the cell phone of Yuka Ito (17). Switching off the music, which she downloaded from the Internet to use as a wake-up alarm, Yuka checks her e-mail: three messages received after she went to bed. Heading for school, she calls a friend on her way to the train station in lieu of writing a reply. As for the other two messages, she writes back on the train.

Yuka even exchanges e-mails with her friends between classes. They decide to go shopping after school and Yuka surfs the Net to check out information on the sales taking place around town. At the store, she just can't make up her mind between three skirts, so she has a friend take photos of her in the fitting room using the tiny camera on her phone and e-mails them to another friend. The friend, who has an excellent eye for fashion, sends back her comments in next to no time.

Yuka finishes off her day with a long bath. Of course, she passes the time by chatting with her friends via e-mail. After the bath, she makes an entry on an online diary site through her phone and then finally goes to sleep.

(Source: An emerging "Thumb Culture": Trends, Japan Information Network, Jan. 10. 2003)

Example to illustrate how young people are integrating cell phones into their lives



Koji Takahashi, age 29

Koji Takahashi (29), a homebuilder employee, recently switched from a PDA to his cell phone to keep track of his schedule. The phone reminds him of important appointments and meetings by sounding an alarm 10, 15 or however many minutes he desires in advance. His cell phone has also replaced his portable music player; he now records music from minidisks onto a memory card attached to his phone.

Moreover, Koji no longer needs to take specialists with him whenever he visits a client who has made an enquiry about home improvement. He can take photos and even videos with his cell phone, send them to the head office and wait for instructions. He can also consult with various sections of the company wherever he might be, therefore giving an estimate for the project takes less time than it used to. Koji communicates with his girlfriend every day, even during work hours. But he doesn't worry about what his boss might think because he can exchange quick, short e-mails with his girlfriend on his cell phone quite inconspicuously. The two of them can decide when and where to meet up without ever talking to each other on the phone.

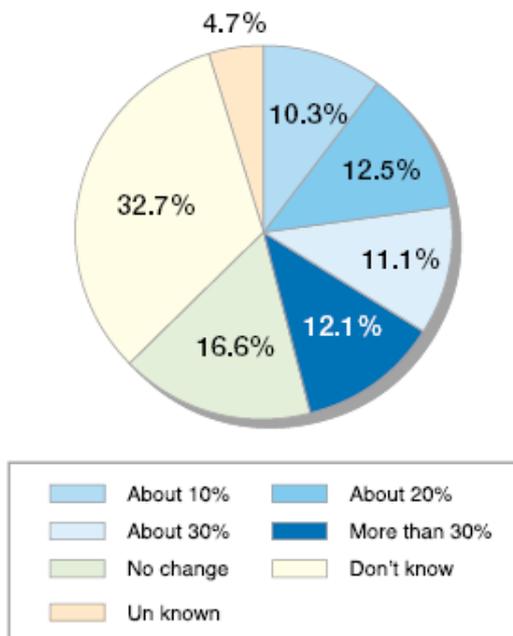
(Source: An emerging "Thumb Culture": Trends, Japan Information Network, Jan. 10. 2003)

3.3.4. IP Phone services

Using the Voice over IP (VoIP) network protocol a normal telephone connection can be established over a fixed or wireless Internet connection. For both businesses and consumers, the result is a cheaper phone bill as calls between IP telephone users are usually free while cheap rates are offered for phone calls all over Japan as well as international calls. In conjunction with the increased use of broadband, use of IP telephone has also been increasing.

IP phone services can also be offered over a wireless connection and the Communications Ministry plans to allow three or four firms to start offering high-speed wireless IP (Internet Protocol) phone services in 2007. These services will use existing wireless LAN technology, but improve the signal range from the current level of a roughly 100-meter radius to several kilometers. Data communication speeds are expected to be about 40 times that offered by NTT DoCoMo Inc.'s 3G cellular phone service - fast enough to allow transmission and reception of broadcast-quality video even indoors or while in motion.

Toll-cutting effect of IP phones



Source : MIC, Communications Usage Trend Survey

Exhibit 13.

For users, the new services will be attractive in that they will likely offer phone charges comparable to those of fixed-line phone services.

In addition to offering stand-alone services, some cellular providers may combine wireless IP phone services with their existing normal cell phone offerings. For example, dual-mode handsets will enable users to reap the benefits of wireless IP phone services - such as cheaper communications charges and data communications speeds similar to those of ADSL Internet access services - where the services are available and use conventional cell phone services at other times.

Example to illustrate how also elder people are integrating cell phones into their lives



Susumu Sasaki, age 75

Susumu Sasaki (75) bought a cell phone half a year ago. Not that he wanders around all that much, but he has a chronic heart problem, so having immediate access to a phone provides reassurance to both himself and his family.

Using a location information service, Susumu can call up a map of his current position anytime - the only difficulty being that he always has to squint to see the map on the small display. If his family has any reason to worry about his whereabouts, moreover, they can request information from an operator, who will check his location and report back in just a few minutes.

Some people of his generation feel that things like computers and cell phones are beyond their comprehension, but Susumu is not one of them. He even uses e-mail to keep in touch with some of his friends. His recent favourite is cell-phone karaoke: He has his granddaughter download his favourite songs to his phone and the lyrics show up on the display as he sings along to the accompaniment. On evenings at the bar with friends, his cell phone sometimes doubles as a mini karaoke jukebox.

(Source: An emerging "Thumb Culture": Trends, Japan Information Network, Jan. 10. 2003)

3.3.5. Spread of Wireless LAN and Hotspots (Wi-Fi)

"Hotspot(s)" or wireless network access points are a communications service found at public places like airports, city halls, restaurants, coffee shops, etc., where you can access the internet with a notebook computer if it is equipped with a wireless LAN system. The main Hotspot communications standards are IEEE802.11a/b/g, having high-speed data communications up to 54 Mbps. Faster WiMax access points are expected to appear soon.

The number of high-speed wireless access points in public places increased from 1,624 at the end of fiscal year 2002 to more than 6,000 in 2006. The percentage of public wireless LAN users is 12.5% in Japan (*Source: WP 2005, Information and Communications in Japan*).

The Nintendo DS, the dual-screen gaming handheld comes with wireless ability (802.11b capability built-in) and Nintendo has announced plans to build a network of 1,000 free hotspots in Japan to be used by gamers. The hotspots could also be used by any other Wi-Fi equipped device.

3.3.6 Digital Television Broadcasting, Satellite and Interactive TV, One-Seg

In the past years, Japan's satellite TV market has gone through a period of consolidation, leaving SKY PerfecTV!, merging with Plat One in March 2004, as the dominant operator. Mobile Broadcasting Corporation's MBSat satellite was launched in March 2004 and with the start of full services in July 2004, Japan has entered the world of TV broadcasting to mobile devices: phones, cars, trains, airplanes, etc. All Nippon Airlines (ANA) relies on Mobile Broadcasting's MobaHO! (<http://www.mobaho.com/>) service as live in-flight entertainment on domestic flights.

1seg is a mobile terrestrial digital audio/video and data broadcasting service in Japan. Service began experimentally during 2005 and officially on April 1, 2006. Terrestrial digital broadcast in Japan is designed so that each channel is divided into 13 segments (plus one segment for separating channels). HDTV broadcast occupies 12 segments, and the remaining (13th) one segment is used for mobile receivers. Thus the name, '1seg'.

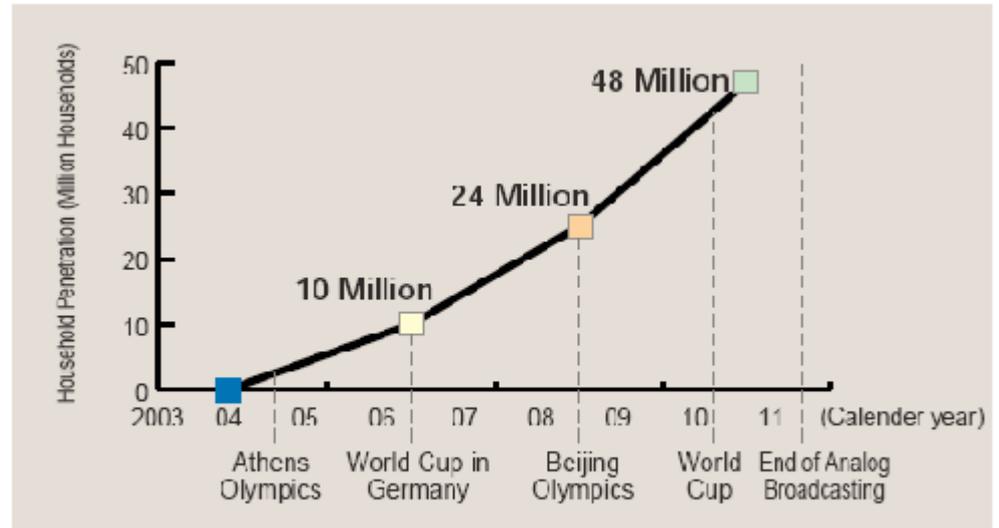


Depending on the broadcaster, the offers include one or more of the following services:

- Electronic programme guide
- Video on demand
- I-services: Web-surfing, games, music downloads, shopping
- Email

Goal for Penetration of Terrestrial Digital Television Broadcasting in Households

Exhibit 14.

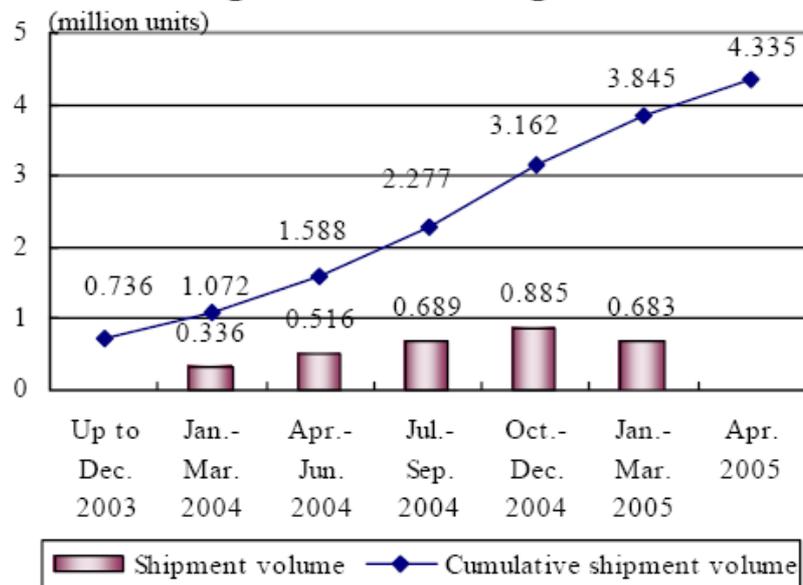


Source: Fourth Action Plan for Promotion of Digital Broadcasting, National Conference for Promotion of Terrestrial Digital Broadcasting

Domestic demand for digital TVs is projected to expand from 1.02 million units in 2003 to 4.4 million in 2007.

Shipment volume of receivers supporting terrestrial digital broadcasting

Exhibit 15.



Source: Japan Electronics and Information Technology Association



3.4. Telecommunication Charges

3.4.1. Cost of fixed and mobile communication

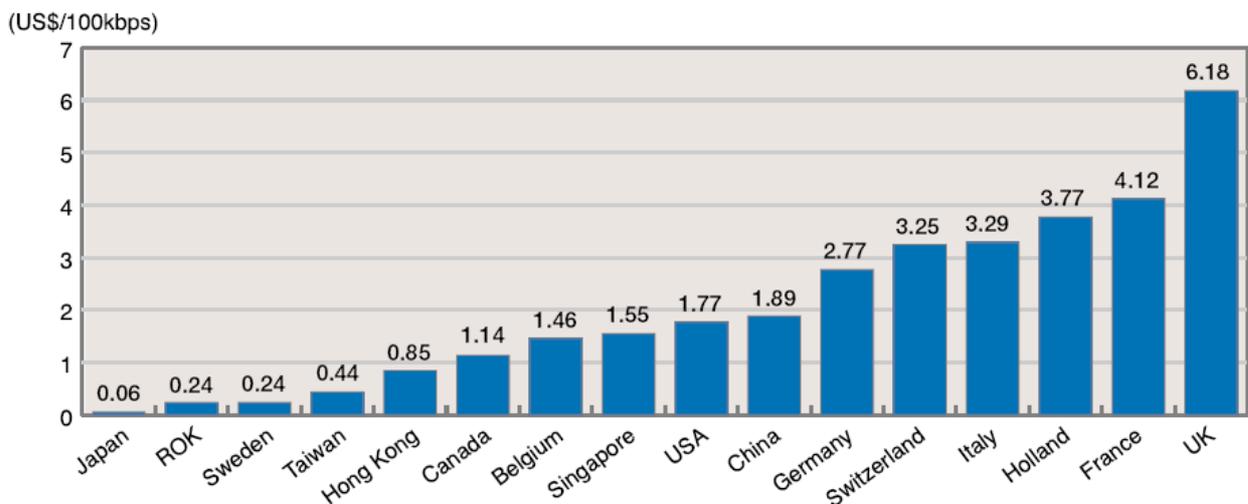
1. There's a general downtrend in the cost of fixed and mobile communication charges due to intensified competition.
2. A substantial decline in the charges for international leased circuits, because of lower charges for international leased circuits to the United States.
3. Compared with 1995, the basic rates and charges for calls have declined by more than 50%.
4. NTT was forced to halve its initial subscription fee from 72.000 to 36.000 yen per line in January 2005. Further price drops are expected in the not too distant future.

3.4.2. Cost of broadband Internet access

The rapid growth of broadband was realized due to the declining charges for the Type I carriers and the intensive competition amongst existing and new carriers. Communication charges for Internet connections used to be more expensive in Japan than in Europe and the United States. However, because of the intensified competition in Japan, broadband Internet access costs have dropped to the lowest level in the world.

Exhibit 16.

International comparison of broadband fees (fees per 100 kbps; 2003)



Source for Figures 1-4-3 and 1-4-4: Produced from on ITU, The Portable Internet (September 2004)
Source: White Paper 2005 Information and Communications in Japan

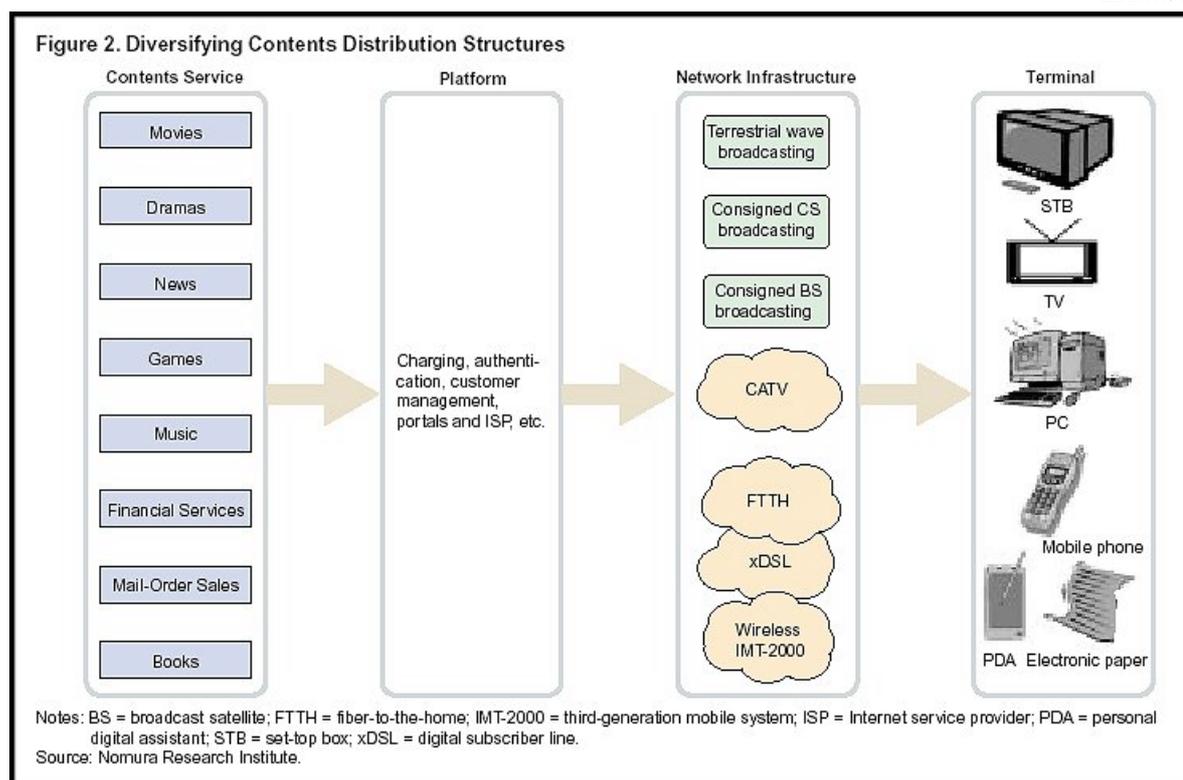
3.5. Convergence of Telecommunications, IT and Broadcasting

3.5.1. In General

Originally, telecommunications used wired technology for one-to-one interactive communications, the telephone being the best known example by the public. Broadcasting has developed into a mass communication medium reaching a large public via radio and television broadcasting. Recently, with the development of new technologies, their convergence has been accelerated as the borders between the two sectors are becoming more vague.

1. Broadband or high-speed and large-capacity technology, such as FTTH (Fibre-to-the-home) optical fibre networks, DSL (digital subscriber line) and CATV (Cable Television) enables the broadcasting of radio and TV programmes, both in real stream and on demand, using the Internet backbone infrastructure.
2. The mobile communications technology: the third-generation mobile system (IMT-2000) makes it possible to provide video delivery equivalent to that of terrestrial TV.
3. The growth of high-speed Internet access and the adoption of IP multicast technology, such as the IPv6 (Internet Protocol Version 6) technology, enables delivery of large-volume data such as broadcast-type voice and video. Moreover, IPv6 permits networking of PCs, electric household appliances and automobiles, regardless of time or place.

Exhibit 17.



The following convergence phenomena can be seen in the present Japanese IT landscape:

1. Convergence of services: e.g. broadband Internet access offered together with cheap broadband telephony as well as mobile phone access.
2. Convergence of transmission lines: e.g. Internet access via CATV networks and CATV using optical fibre normally used for the transmission of TV broadcasting.
3. Convergence of terminals: a variety of terminals are used for both communications and broadcasting. Recently, TV sets with built-in Internet connections and PCs with built-in TV tuners have appeared on the Japanese market, making it possible not only to view but also to record programmes on the large capacity hard disk drive of the computer/TV and later to store them on DVDs.

3.5.2 Fixed-mobile convergence (FMC) services

Services based on integrated fixed phone and mobile phone networks, known as fixed-mobile convergence (FMC) services, are currently being launched in Japan. For phone companies, the FMC concept is a double-edged sword that could save their declining fixed phone businesses but could also trigger a major industry reorganisation because it requires all-around strength for competitiveness.

FMC is still loosely defined, and the services grouped under it range from the simple integration of billing for fixed and cellular phones to direct access to both fixed and cellular networks using a single mobile handset.

On January 23, KDDI Corp. introduced its LISMO service (“au Listen Mobile Service”), which allows cell phones to work as portable digital players of music downloaded via the Internet to PCs.



Exhibit 18. LISMO official logo

Phone companies are warming up to FMC at a time when fixed phone subscriptions have fallen by 5.4% from the 1970 peak to less than 60 million in fiscal year 2004 and the cellular phone market nears saturation at 90 million subscribers. They hope to channel some of the heavy cell phone traffic back to fixed phones.

(Source: The Nikkei Business Daily, January 30, 2006)

With this rapid progress in convergence, the distinction between the different communications networks is narrowing very quickly. A wide variety of new devices and services is already available on the market or will appear in the very near future, creating a whole new market.

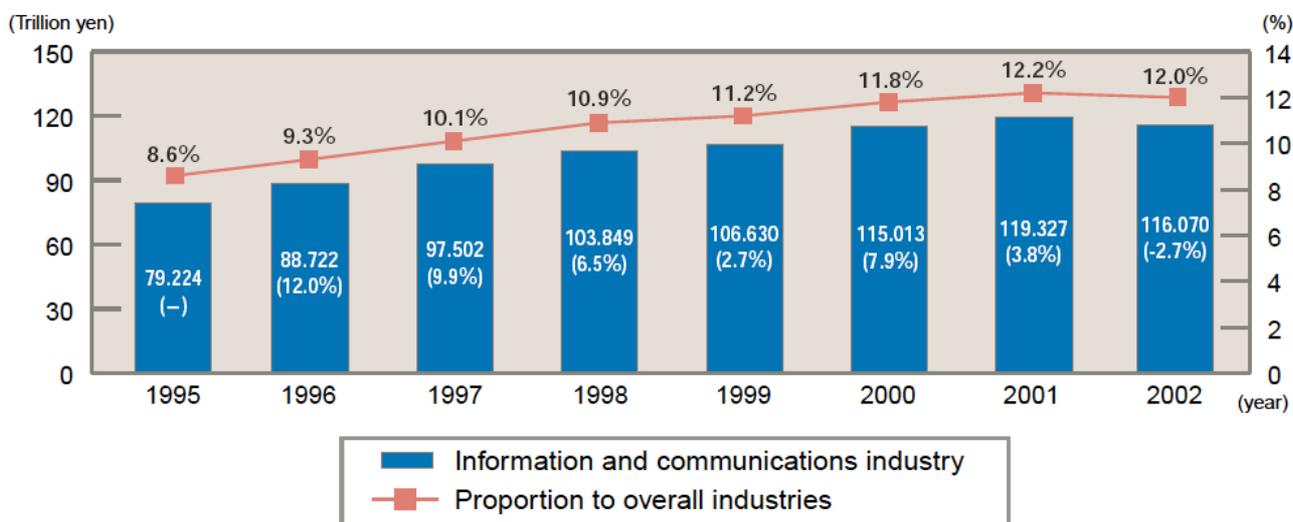
4. The IT Market in Japan

4.1. Overview of IT-related business in Japan

Although the numbers are slightly old, the market value of Japan's information and communications industry reached 116 trillion yen in 2002 (773 billion Euros), a 2.7% decrease from the previous year, the first decrease since 1995. One of the reasons for this is a reduction in investment in computers and peripherals as well as wired and wireless telecommunications equipment, due to a curb in capital investment by each industry. In addition, the share of the information and communications industry as a proportion of total industrial market value stood at 12.0% (a 0.2 point decrease from the previous year), decreasing for the first time since 1995.

Exhibit 19.

Transitions in the Market Size and Proportion of the Information and Communications Industry to Overall Industries



Note: The percentages in brackets indicate changes over the previous year.

Source: Survey on Economic Analysis of IT

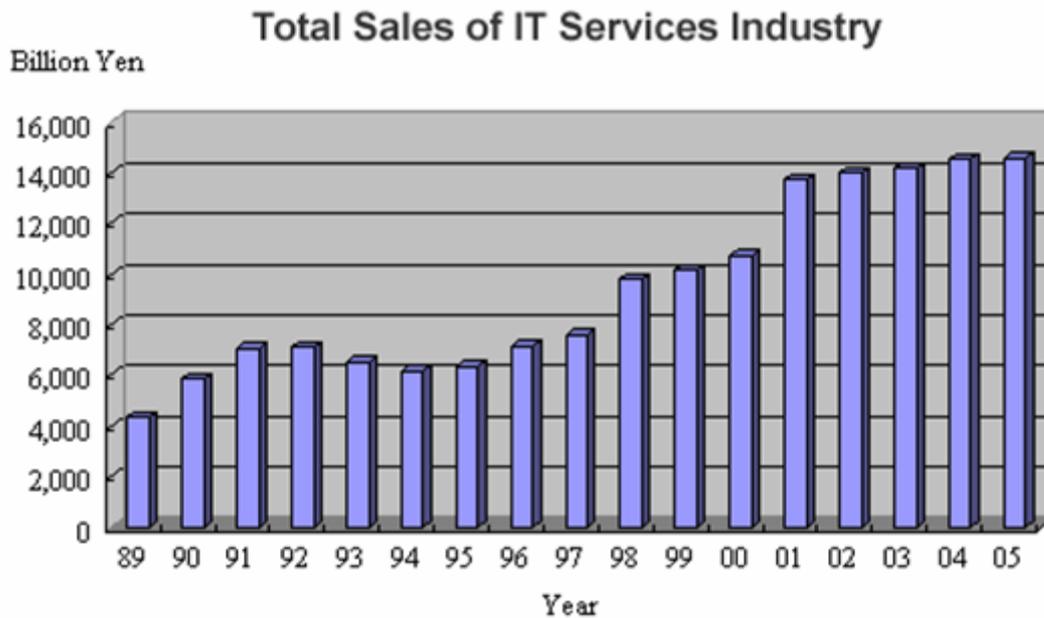
4.1.1. IT Software and Services

- **Market Size:** Roughly 14 trillion yen, about 93 billion Euros (Source METI, 2005)
- **Business categories:** Custom business software, basic computer software, game software, etc., the largest market segment by far is customized software (49.6%)
- **Main clients:** The main clients making use of IT services are the manufacturing and the finance & insurance industry and should therefore be targeted by European companies with competitive products or services in this area.



- **Outsourcing:** Japanese companies are shifting their software development to cheap-labour Asian countries such as China, Thailand and Vietnam.
- **EU import share:** Imports of EU software (especially application software) show high and increasing figures since 2000.

Exhibit 20.



Source: Japan IT Services Industry Association, METI

Exhibit 21.

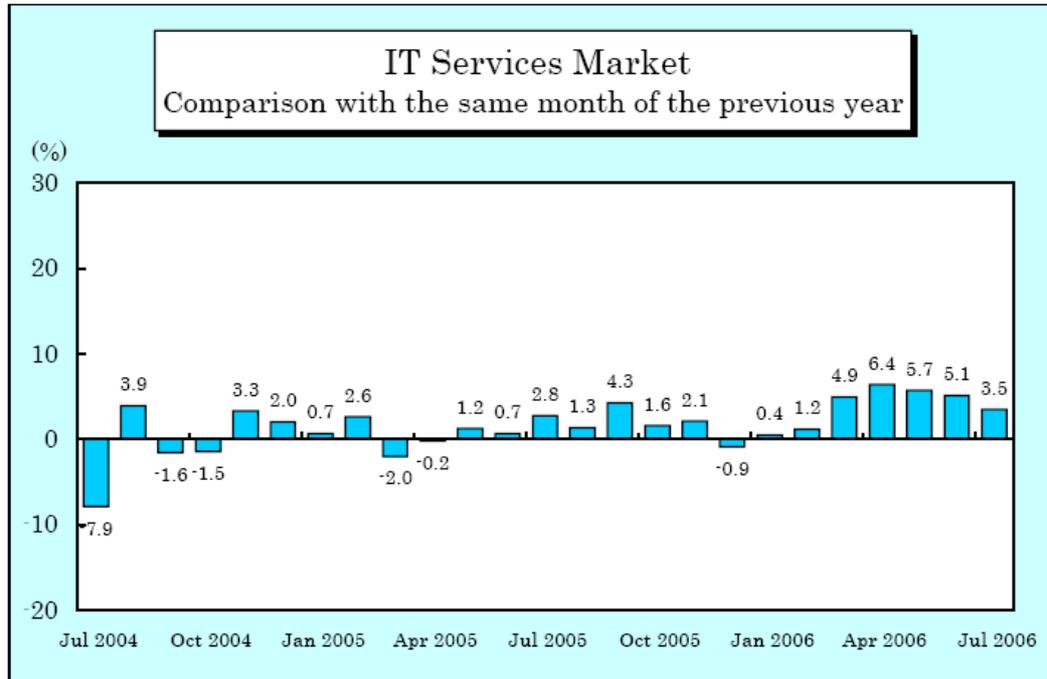
Sales by Categories

	Jul 2006		Compared to Jul 2005 (%)
	(Mil. Yen)	(%)	
Total	648,082	100.0	103.5
Customized Software	349,497	53.9	106.1
Software Products	79,279	12.2	111.9
Information Processing Services	54,315	8.4	103.0
Facility Management	102,631	15.8	97.6
Database Services	11,650	1.8	106.0
Research	7,648	1.2	97.7
Others	43,062	6.6	92.4

*This survey is done based on 60-70% of Japanese IT Services Market.

Source: METI (<http://www.meti.go.jp/>), Current Survey of Selected Industries, July 2006)

Exhibit 22.



Source: METI (<http://www.meti.go.jp/>), Current Survey of Selected Industries, July 2006)

Source: Japan Information Technology Services Industry Association (<http://www.jisa.or.jp>)

The information presented above on the present Japanese IT market should help the management of an exporting EU small and medium-sized enterprise find out the feasibility of their products for the Japanese market.

4.1.2. Hardware

- **Market Size:** 27.4 trillion yen, 183 billion Euros (Source: JEITA, Jan-Dec 2005)
- **Business types:** Consumer & industrial electronic equipment, components and devices
- **Outsourcing:** Japanese companies continue to shift their production to cheap-labour Asian countries such as China, Thailand and Vietnam.

Conclusion

To succeed and to achieve better results, EU companies not only will have to study and to investigate the Japanese market to find and to locate their strong points, but they will also have to compete not only with the US but also with many other Asian countries. This means to compete with the high technology of the US and with the low labour cost of Asian countries.

4.2. ICT use by companies

The White Paper 2005 on “Information and Communications in Japan” gives a detailed overview of the ICT use by companies and individuals.

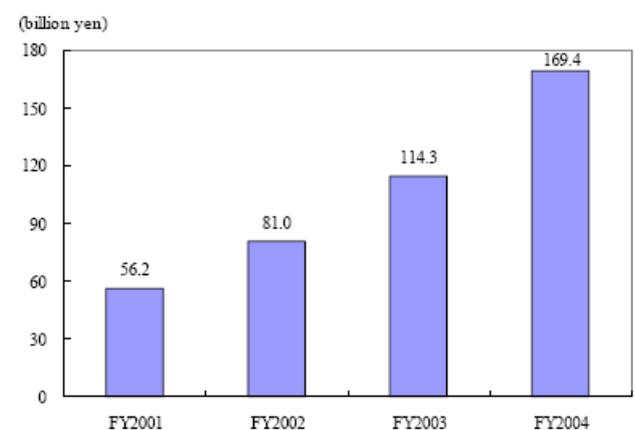
4.2.1 Enhanced use of ICT by companies

- An Internet utilisation rate of 98.1% indicates that most companies are using the Internet.
- Mobile phone utilisation rate was 65.8%: cell phones are used for voice calls, as well as for accessing the corporate intranet.
- While use of custom-made application software has decreased, use of package application software increased.
- The purpose of introducing ICT systems has changed from “reducing costs/improving operational efficiency” to “expanding sales/increasing added value”.
- The rate of introducing open source software (OSS) as the server OS is the highest in the United States at 33.0%, while in Japan it is still 21.0%. Main reasons to use OSS were the “low introduction/operational cost” and “flexible customization”.
- A shift from mainframe systems to open systems can be seen in Japan.
- Internet VPNs (Virtual Private Networks) are becoming widely used as the trunk systems for corporate communication networks.
- About 40% of companies have introduced, or are in the process of introducing IPv6. About 60% believe that IPv6 will diffuse within three years.

4.2.2. Expansion of new businesses using ICT

- In line with the spread of the Internet, new “Internet”-businesses have rapidly grown over the past five years.
- Since 2004, expenditure for Internet ads exceeds that for radio ads, making the Internet the fourth largest advertising medium.
- Internet transactions accounted for about 25% of all securities transactions.
- The amount of sales by mobile contents providers tripled in three years.

Revenues Top-15 Mobile Content Providers



Source: White Paper 2005 “Information and Communications in Japan”

Exhibit 23.

4.2.4. Shift from e-Commerce to m-Commerce

Mobile commerce (or m-Commerce) is the mobile phone equivalent of online shopping. Mobile phones are used in Japan to purchase many different types of products from music to train tickets, air tickets, event tickets, books, and even cars. Mobile commerce revenues exceeded mobile content (music, weather, news, etc.) revenues in Japan for the first time in 2004.

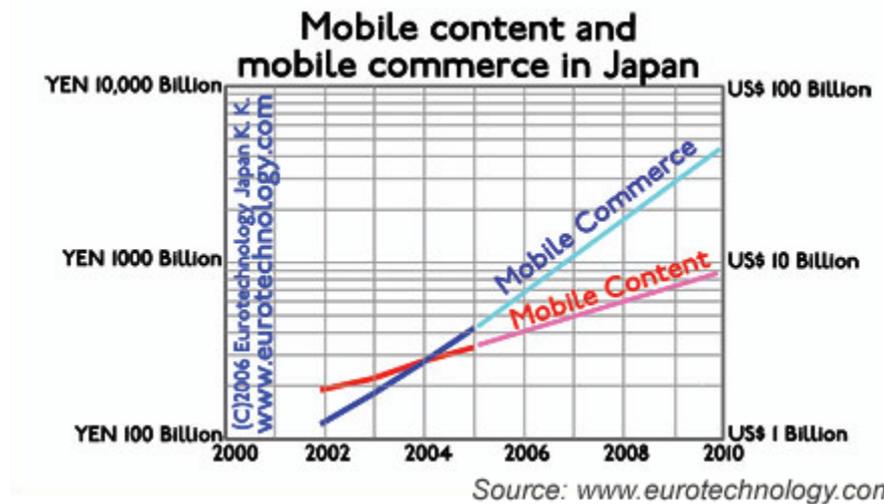


Exhibit 24.

Research by Eurotechnology.com indicates that m-commerce has reached approximately US\$ 10 billion per year in Japan and is on the way to reach US\$ 100 billion in the not too distant future.

Surveys by the Ministry of Economy, Trade and Industry and other institutions amongst all businesses engaged in consumer-oriented e-commerce indicate that:

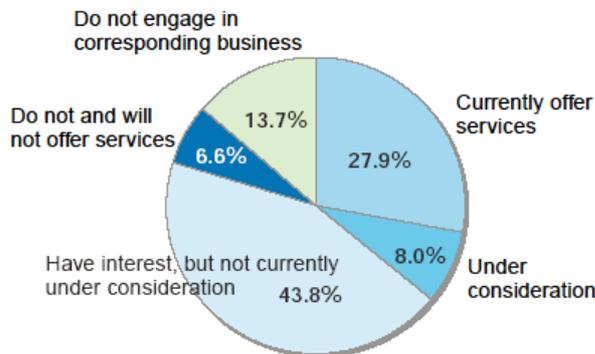
- About 15% of the respondents say they have no plans to customize their business towards broadband or mobile users
- 35.9% or more than one third of businesses feels the need to focus on broadband users or is considering doing so in the near future
- 46% or almost half of all respondents is already targeting mobile users and another 9.9% is considering moving into that direction

Conclusion:

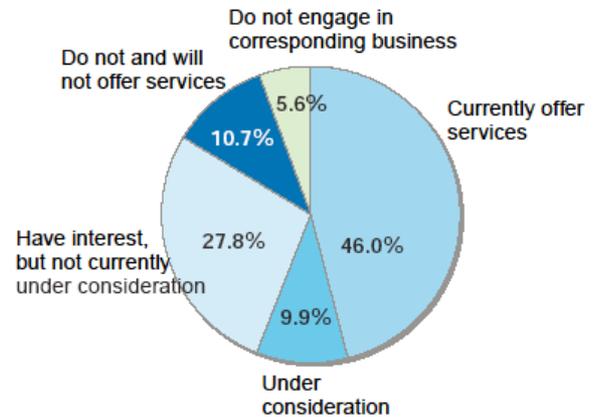
Getting an e-Commerce site to sell products and services online was a big issue in the past years. Nowadays, targeting the mobile user has become a priority for many consumer-oriented companies.

Exhibit 25.

Status of E-Commerce Suitable for Broadband *



Status of Suitable for Mobile Terminals *



*Percentage of B-to-C businesses engaged in consumer-oriented e-commerce.

Source: Survey of Ubiquitous Network Usage Trend by Businesses

4.2.5. Computer and Network Security

4.2.5.1. Computer security breaches

The number of incidents is the total of cases reported to the two most important Internet security-related authorities, namely the 'Information-technology Promotion Agency, Japan' (IPA) and the 'Japan Computer Emergency Response Team Coordination Centre' (JPCERT/CC).

The actual number may be much higher as such reports are not mandatory. Unauthorized network accesses increased year by year until 2001, but in 2002 the number decreased substantially by approximately 40%. In 2003 and 2004, the number of reported cases went up again to 3.400 and 6.000 respectively.

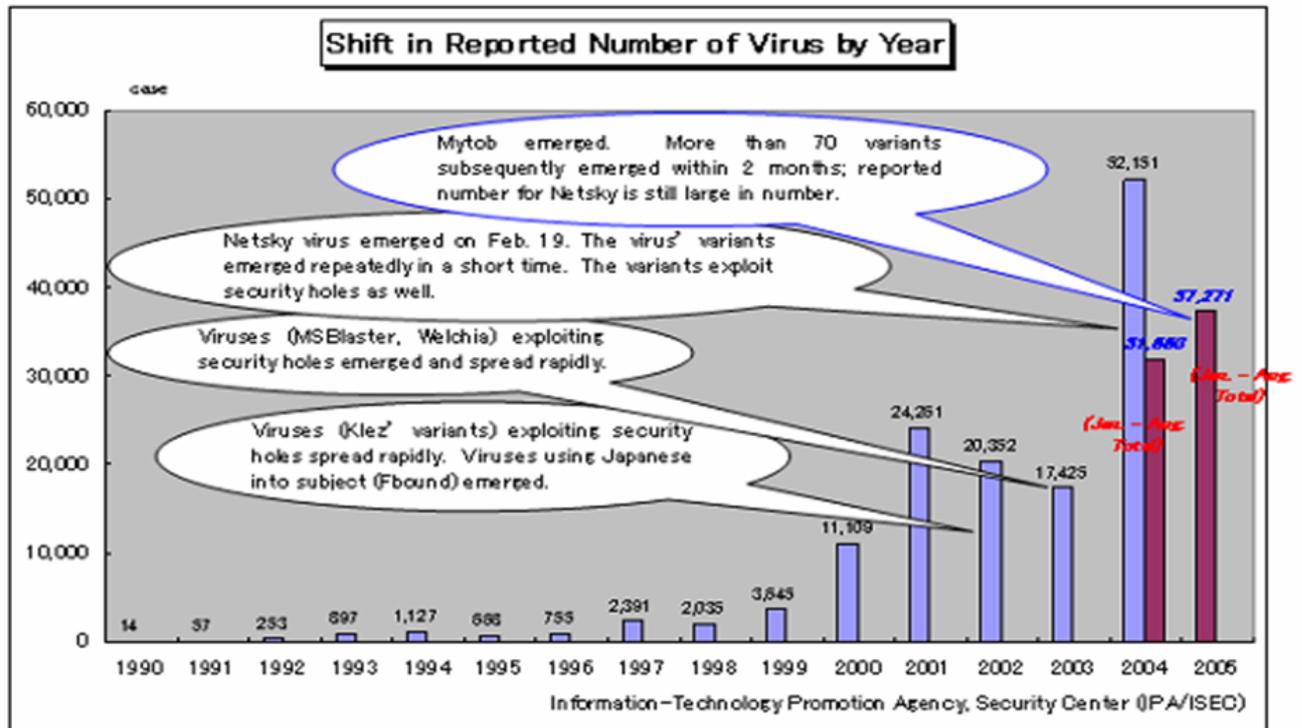
4.2.5.2. Computer viruses and Unauthorized Access

The number of computer viruses started with 57 cases in 1991 and gradually grew to 24.251 cases in 2001. Although there was a slight improvement around 2002-2003, the number of cases has gone up again to over 50.000 reported cases in 2005.

The Japanese government and organisations such as IPA and JPCERT have been organizing new awareness campaigns towards the end user and, therefore, anti-virus software companies are doing big business in Japan.

The main ICT security measures taken by companies are “virus-checking programmes”, “employee education” and “firewalls”.

Exhibit 26.



(Source: Information-technology Promotion Agency, Japan, [<http://www.ipa.go.jp/index-e.html>])

4.2.5.3 Spam and Phishing

Spam is considered the most frequent incident amongst individuals: 80% of PC users and 70% of mobile phone users have received spam in the past. The most common anti-spam measures taken by PC users was “using the device’s built-in anti-spam tool, rejecting e-mails through the specified senders function, or accepting e-mails only from the specified senders function” and the one taken by most mobile phone users was “using a complicated e-mail address.”

Phishing has grown into a social problem in the United States. Phishing incidents were also seen and caused problems in Japan last year.

4.2.5.4 Personal Information

In recent years an increase could be seen in the number of incidents where personal information (names, phone numbers, email addresses, credit card information etc.) was leaked.

A new law, the “Law Concerning the Protection of Personal Information”, came into force in April 2005. Companies’ efforts to protect personal information made progress. Still, the recognition rate of spyware is low and hardly any measures are taken against it.



4.2.5.5. Efforts by the Japanese Government

According to the White Paper 2004 "Information and Communications In Japan", the Japanese government is promoting measures for information security and privacy protection.

1. Strengthening public-private cooperation toward ensuring information security: Detect the outbreak of incidents as early as possible, gather and analyse information, promote countermeasures
2. Research and development relating to secure operating systems: Evaluate merits and disadvantages of open-source and non-open-source operating systems from various perspectives, including security, operation and cost
3. Protecting personal information in the information and communications field: Law Concerning the Protection of Personal Information came into full effect in April 2005. All companies and organisations are obliged to have a clear policy on how they collect, store and maintain personal information.
4. Measures to upgrade emergency information functions: upgrade emergency information functions in the telecommunications business

(Source: IPA standing for 'Information-technology Promotion Agency, Japan', [<http://www.ipa.go.jp/index-e.html>], JPCERT/CC standing for 'Japan Computer Emergency Response Team Coordination Centre' [<http://www.jpCERT.or.jp/english/>]), White Paper 2004 & 2005 on "Information and Communications In Japan"

Conclusion:

It is premature to conclude that in Japan the Internet environment is safe or safer than somewhere else and that the security problem is nearly solved. One should keep in mind that not all cases are reported. Compared to the increased use of the Internet, the number of cases has stayed relatively stable in the past years. This amelioration is also thanks to better resistant computer systems and stronger anti-virus tools.

In order to promote e-commerce and e-administration, big efforts are made to make the Internet safer and safer. One could conclude therefore that nationally, Japan is heading into the right direction regarding its security policy.

The security problem however, is not one that can be solved by one country alone. It is everyone's problem and it has to be done in dialogue and cooperation with other countries.

Japan is very open in sharing new technologies and in actually working together on projects especially in the security field. This might create some lucrative business opportunities for EU companies.

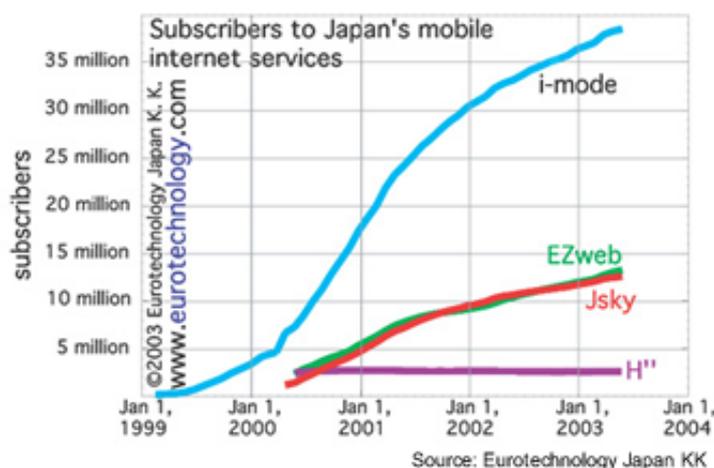
4.3. Remarkable advanced IT realizations in Japan

4.3.1. i-Mode: the success story of NTT DoCoMo

i-Mode in fact was invented by Mrs. Mari Matsunaga, whom Fortune Magazine selected as one of the most powerful women in business. i-Mode is the mobile Internet access system of NTT DoCoMo. The "i" can stand for information, Internet and as well for 'ai', the Japanese word for love.

The i-mode service is considered a tremendous success in Japan with the total number of i-Mode users surpassing 47 million in August 2006. The service has also been introduced in Europe through KPN Mobile in March 2002. Other mobile phone companies offer similar data-packet services such as x-CDMA, GPRS (e.g. in Europe)

Exhibit 27.



Companies are also using more and more i-mode for business purposes. Below, you can find a list of popular i-mode functions at present:

- Scheduling of customer meetings
- Reporting of sales numbers, etc.
- Remote server management over a virtual private network (VPN)

4.3.1.6. Flat-Rate Data Services

New flat-rate billing plans have been introduced for heavy users of data communication services. NTT DoCoMo and KDDI have introduced flat-rate billing plans for packet (data-only) communication, allowing subscribers unlimited access for a fixed monthly charge. The new plans are a compelling alternative to plans to charge by the amount of data exchanged with the user's mobile device.

In November 2003, KDDI introduced its EZ Flat flat-rate data plan, then in August 2004 it introduced the Double Flat Rate plan, which starts as low as 2,100 yen and rises to a maximum of just 4,200 yen (Euros 31.1) according to the customer's level of data usage. According to KDDI, more than 80% of its some 570,000 3G subscribers were using this flat rate plan as of June 2004.

In June 2004, NTT DoCoMo introduced Pake-Houdai, a flat-rate data communications plan for unlimited use of the i-mode mobile Internet service on DoCoMo's 3G FOMA mobile phones. The service is targeted at users who subscribe to monthly rate plans costing 6,700 yen (Euros 49.6) or more. For an extra monthly charge of 3,900 yen (Euros 28.9), subscribers can use i-mode all they want. NTT DoCoMo's flat-rate subscribers surpassed the one million mark in August 2004, meaning that about 20% of the five million FOMA users had switched to flat-rate billing.

(Source: "Japan's Mobile Content Industry", Japan Economic Monthly, JETRO, December 2004)

4.3.2. Camera-equipped mobile phones & Sha-mail

"Sha-mail" literally means "Picture-mail": taking pictures with a digital camera built into a mobile phone and sending the picture by email to another mobile phone or via the Internet to a PC. It was first introduced onto the Japanese mobile phone market by J-Phone/Vodafone. Nowadays, all major carriers offer Sha-mail services and there are hundreds of millions of Sha-mail users worldwide.

Millions of sha-mail users in Japan and many hundred millions worldwide have lead to the birth of a huge new industry. In addition to the traditional carriers and handset makers this includes also service providers, printing machines, online-printing services and many other related service industries.

Handsets with 1 or 2-megapixel cameras have been available since the end of 2003. Current models feature a 2 to 4 mega-pixel camera module. Such camera phones can deliver pictures with sufficient quality for business or government applications. They can be used in many different fields like tele-medicine, policing, insurance damage reports, real estate applications, police work and many other areas where images need to be transmitted instantly.

Until recently, such devices did not exist in mass production at low end-user prices and therefore, many new applications may appear in the future creating new business opportunities for foreign companies and component suppliers.

4.3.3. Position determination via GPS (Global Positioning System) and triangulation

Several mobile phone models feature a built-in GPS system to determine your location. Other models are capable of determining your location by triangulation, which is also fairly accurate in densely populated areas. A map of the area with your position indicated as a cross-mark is then downloaded from the server.

Thanks to GPS it is also possible to send a map of your position to the other persons per email. Many teenagers are using this function to let their friends know their position or location in the city. Also businessmen, when they have problems finding the offices of their customers, sometimes ask via phone to send a map to their mobile phone.

Example of a GPS-based service: Vodafone live! NAVI and NAVITIME

	<p>Vodafone live! NAVI is a GPS service for finding your way around. You can look up the best routes to your destination and communicate your present location to your friends.</p>
<p>NAVITIME (NAVITIME JAPAN)</p>	<p>NAVITIME helps you find your way about on foot, by train, air, and car. It offers you a voice direction and displays the route by aerial photographs. Even while overseas, it supports you to find the right route of an area with GPS.</p>
	

4.3.4. RFID or Smart Cards

4.3.4.1. What is a Smart card?

One can think of the smart card as a “credit card” with a “brain” - a small-embedded computer chip. This card-computer can be programmed to perform various routine tasks and store a limited amount of information.

Smart cards are currently used as credit or cash cards (electronic money), social security cards, driving licenses, ID cards, building access cards, etc.

4.3.4.2. Examples of Smart Cards in Use in Japan: Felica, Suica, EDY and the “Osaifu-Keitai”

In July 2004, DoCoMo launched mobile wallet services on its new 506i-series i-mode phones that are equipped with a contact-less IC-card called **Felica**, a technology provided by Sony.

Felica technology is already used in **Suica** debit cards that allow commuters on Japan Railways trains to pass through the ticket-gates by simply passing the card over a reader to pay. Suica stands for “Super Urban Intelligent CArd”. Suica cards can be charged at ticket-vending machines at stations. With 14+ million users and about 4 billion Euros in transactions per year, Suica promises to become one of the important e-cash systems in Japan.

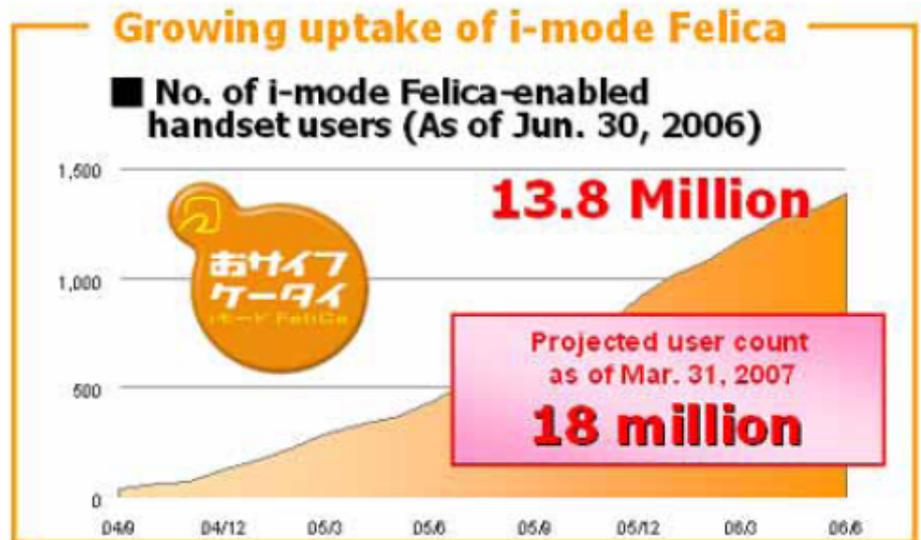


Exhibit 28.

A different application is through **EDY** (which stands for Euro-Dollar-Yen) cards that can be used to pay at shops like convenience and drug stores. The EDY cards, for instance, can be used for groceries at a convenience store or lunch at a restaurant. Instead of fumbling for cash, one only has to place the card next to a display at the cash register. About 9 million Suica and EDY cards have been issued thus far.

Mobile Suica: Since January 2006, Suica has been incorporated into mobile FeliCa wallet phones by Japan’s mobile operators. This system includes JAVA applications to manage the Suica function in the mobile phone, to recharge the Suica card stored in the mobile phone, review the stored value and perform other functions via the mobile phone.

Sales of i-mode FeliCa smart-card handsets reached 13.8 million units on June 30, 2006 and are projected to exceed 18 million units by the end of March 2007.

Exhibit 29.

KESAKA System Inc. has begun offering a service that allows the “OsaiFu Keitai” handsets to be used as **apartment door keys**. The service also allows the users to lock or unlock the door while they are out.



Contactless Door Key

Source: Sony

ANA's "Smart e-Service" makes the process from flight booking to check-in and ticket pickup faster and easier using the "Osaifu-Keitai". Furthermore, mileage points earned and stored in the "Osaifu-Keitai" can be converted to "Edy" e-money.

4.3.4.3. Future of smart cards in Japan

Suica: Preparation has begun to integrate Suica with the new PASMO system which is being implemented by Tokyo Metro and private railway and bus companies in the Tokyo region, to replace the existing PASSNET system. This will allow passengers to use Suica to ride almost any railway in the Tokyo area. PASMO is to be launched in March 2007.

Mobile Suica: An enhancement for 2007 will allow for Suica charges to be added directly to the phone bill, eliminating the requirement to constantly add to and monitor the remaining balance.

(Source: <http://en.wikipedia.org/wiki/Suica>; <http://www.nttdocomo.com>)

In this market segment, there is surely room for business development resulting in lucrative opportunities. Smart cards are currently expanding their application in the fields of education, hospital, entertainment as well as governmental and administrative sectors. Actual needs are felt for implementing electronic data processing with high security features. Given the widespread usage of financial smart cards in Europe, we foresee a strong competitive edge for companies in this field.

4.3.5. Electronic Toll Collection (ETC)

For details on ETC in Japan, we refer to chapter 4.4.2.3. Example of Ubiquitous services: Ubiquitous Automobile Network Systems.

4.3.6. 2-Dimensional QR barcode

The QR Code is a kind of 2-dimensional barcode originally developed by Denso in 1994. The QR Code contains information in both vertical and horizontal directions. While conventional bar codes are capable of storing a maximum of approximately 20 digits, QR Code is capable of handling several dozen to several hundred times more information. QR Code is capable of handling all types of data, such as numeric and alphabetic characters, Kanji, Kana, Hiragana, symbols, binary and control codes.

Exhibit 30.



Most important features:

- High capacity encoding of data: Up to 7,089 characters can be encoded in one symbol.
- Small printout size: encoding of the same amount of data in approximately one-tenth the space of a traditional bar code
- Kanji and kana capability: encoding JIS Level 1 and Level 2 kanji character set
- Dirt and damage resistant: Data can be restored even if the symbol is partially dirty or damaged
- Readable from any direction in 360°: detection patterns guarantee stable high-speed reading

New camera-equipped phones have the scanner software required to read the QR code already built in. As a result, the QR code starts to appear everywhere: in magazines (by scanning the code next to the article, your phone browser will link to a website with more information), on business cards (personal information can easily be imported), etc.

Exhibit 31.



4.3.7. Marketing and Market Research with the Mobile Internet

As mobile terminals have become the normal and routine communication tool among ordinary consumers, many companies now use mobile telephones specifically as a sales and marketing tool, but also for real market research.

Also, mobile telephones have become a key business infrastructure for individual marketing: also called one to one marketing. It is especially a powerful marketing tool to young adults, who are more indifferent to flyers, newspaper and TV ads.

Mobile Mill (<http://mobile.macromill.com>), a Tokyo-based market research company, offers their clients a new way to find out what people think about their products.



Before launching a new sports drink, a company decides to give away 500 samples to random people in a busy shopping street. The new “Mobile Jelly” drink comes with a little card and by scanning the QR code (see 4.3.1) on that card with your phone, a questionnaire shows up in the screen of your phone. All answers are stored in a database, which allows the marketing manager to monitor the results in real-time, while more and more people submit their feedback.

At the end of the day, when all samples have been handed out, the marketing manager receives an email with the full market research report.

Using the latest mobile phone technologies, market research can be done much faster and cheaper than ever before.



Try out the new “Mobile Jelly” drink...



and answer a few questions.

(Pictures courtesy Keitai Watch, <http://k-tai.impress.co.jp>)

4.4. Perspectives for the future in the Japanese market

4.4.1. Networking of household appliances

4.4.1.1. Some household appliances for networking

Household electric appliances like refrigerators, microwave ovens, washing machines, air conditioners, sewing machines, TV sets, satellite broadcast receivers, VTR sets, video cameras, CD players, stereo sets, etc. will certainly be networked in the future.

4.4.1.2. Various types of home networks

Several home network options are already available on the market. Important elements are low price, high-speed technology and user-friendliness. Wireless LANs are more and more adopted, also in AV equipment.

- Wire types: Ethernet, HomePNA, IEEE 1394b, ECHONET, High-speed power line carrier system
- Wireless types: Wireless LANs (2.4 GHz), Wireless LANs (5.2 GHz), Bluetooth and Infrared

4.4.1.3. Examples of networking trials of household electronic appliances

Attempts are made to network household goods with applications that control home appliances via the Internet while away from home, thus providing home security services by transmitting data. The following household appliances were examined in a networked environment, namely an air conditioner, a microwave oven and a sewing machine.

Air conditioner: SRK36SD (Mitsubishi Heavy Industries, Ltd.)

The user sends an e-mail by mobile phone, when away from home and the personal computer that receives this e-mail will control the air conditioner as instructed in the email. Data transmission system is done via a specified small power mobile radio system.

Thermos bottle: i-Pot (Zojirushi Corp.)

Data, on how the thermos bottle is used, is transmitted by e-mail to a registered person to let him or her know the bottle's usage condition. Data transmission system is done via a public wireless packet telecommunication.

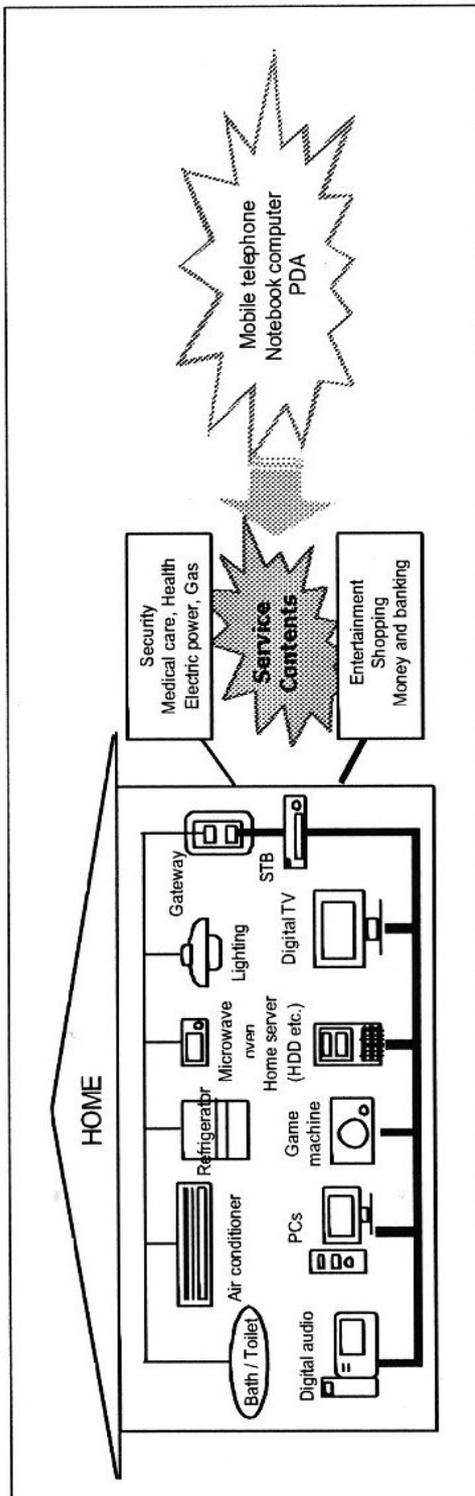
Microwave oven: RE-LC30 (Sharp Corp.)

The user can download a recipe via "the cooking information box" of the microwave oven that is connected to the network. Data transmission system is done via "the cooking information box".

Sewing machine: ULT 2I (Brother Industries, Ltd.)

The PC downloads embroidery pattern data and reads the data into the sewing machine via a floppy disk (FD). Data transmission system is done via personal computer and FD.

Exhibit 32.



STB: (Set Top Box that connects Internet and TVs)

Internet Appliances, a market full of expectations

Posts and Telecommunications Minister Katayama said at the Global Information Summit on 19 February 2003 in Tokyo that the Japanese government intends to promote the spread of Internet-accessible home electric appliances to boost the use of fast-speed communication networks.

“Japan has a well-developed infrastructure for high-speed data communications, but networks are still under-utilized,” he said in his speech.

Thanks to the expansion of broadband services and their high-speed connections, full-scale implementation of the so-called home networks is under way. The network is used to control network-enabled home AV equipment (TV sets, video equipment, stereos), IT equipment (PCs, PDAs, etc.) and large appliances (refrigerators, air conditioners, microwave ovens, lighting equipment, etc.). The benefits of these systems are relatively low costs, energy-saving and assistance to the elderly who live independently.

Electric appliance manufacturers are developing appliances with the necessary devices for the application. In 2006 the most popular networked home appliances are DVD-harddisk recorders and game-units that come with network connections.

4.4.2. Ubiquitous Networks

4.4.2.1. General meaning of ubiquitous

The word “Ubiquitous” was seldom heard until recently. It is derived from the Latin word “ubi”, meaning “where”, and “ubique”, meaning “everywhere”. Therefore, a “ubiquitous network” simply means: a network that is accessible from any place, at any time and by any means.

4.4.2.2. Essential Elements of Ubiquitous Networks

Nowadays, one can already access networks with several terminals like desktops, mobile PCs, mobile phones, PDA's, TV sets, etc. Such varied, widespread, and widely accessible networks are called “ubiquitous networks.” It can be somehow compared with TV and radio: they seem to be everywhere in the air and one just has to turn it on to be connected and to reach many channels. The essentials of ubiquitous networks are:

- It comprises many networks with broadband capabilities, mobile characteristics, continuous dedicated access via any kind of medium like stationary or mobile terminals, wired or wireless systems, telecom or broadcasting, etc.
- It is able to support IT (information technology) related equipment, such as mobile phones, PDA's, car navigation terminals, consumer information appliances, desktop computers and mobile PC's that are networked with each other via a barrier-free (access friendly) interface.
- It creates an environment in which digital data can be exchanged in an interactive and seamless manner, with more freedom and comfort than before.
- For ubiquitous networks it is desirable that the IPv6 (Internet Protocol Version 6), which allows far more devices to be connected to the Internet, becomes the generally accepted industrial standard.

4.4.2.3. Example of Ubiquitous services: Ubiquitous Automobile Network Systems

These systems offer a comprehensive link connecting vehicles, drivers and road administrators on a real-time basis via the network. Therefore, road conditions and the collected information can be delivered to road administrators and drivers promptly.

An innovative example of this is the ubiquitous road pricing system, which provides the location and other information on all vehicles equipped with an ubiquitous personal terminal. A road pricing system adjusting the tolls in accordance to traffic volume or congestion could be implemented for applicable roads.

Intelligent Transport Systems (ITS)

ITS is a system that is designed for the purpose of contributing to the solution of road transportation problems such as traffic accidents and traffic congestion by networking people, road and vehicle data information via state-of-the-art information and communications technology. Research and development efforts in Japan have been focused on core ITS technologies and have successfully led to some commercial applications.

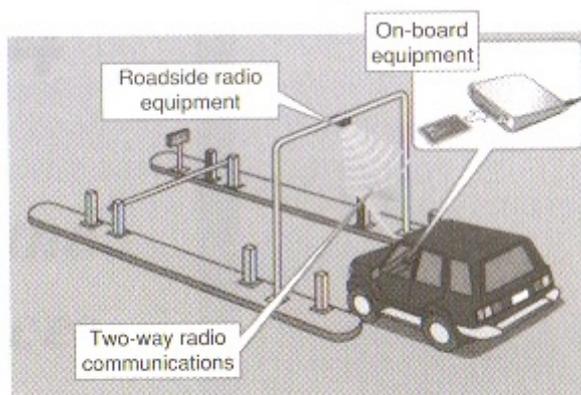
Major ITS systems

1. VICS (Vehicle Information and Communications System): Providing real-time traffic congestion information
2. ETC (Electronic Toll Collection System): Eliminating traffic congestion at tollgates by driving through tollgates without stopping.
3. AHS (Advanced Cruise-Assist Highway System): Supporting safe and automated driving

Electronic Toll Collection (ETC) is already widely used in Japan

ETC is a system to eliminate the need for a car to stop at tollgates for payment. Subscriber toll information is transmitted both into the highway computer system and into the IC card inserted in the on-board equipment through radio communication. In January 2005, there were already 985 locations nationwide equipped with ETC devices.

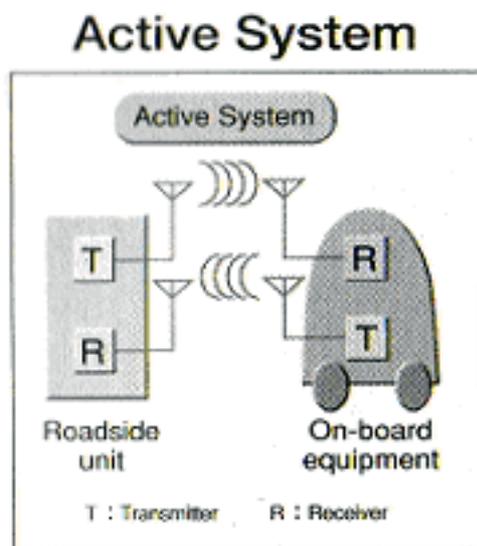
Exhibit 33.



Source : MLIT

By putting ETC into practical operation Japan, as the first country in the world, adopted an active system in the 5.8-GHz band for two-way communications as a system to exchange information between on-board equipment and roadside equipment. As a transmitter is also included in the on-board equipment, this system is superior to the passive system (in which the on-board equipment does not include a transmitter) in terms of reliability and the ability to handle a large volume of information transmitted and/or received at high speed. Accordingly, the system can be used for a variety of ITS services.

Exhibit 34.



Source : MLIT

Development stages for AHS (Advanced Cruise-Assist Highway Systems)

AHS development is divided into three stages in accordance with the service level for drivers:

1. AHS-i (information service): providing information on driving environment and caution warnings.
2. AHS-c (vehicle control assistance service): providing driving assistance through partial control of vehicles based on information from infra-structural elements, such as lane-crossing signals and vehicle sensors.
3. OAHS-a (automated driving service): providing fully automated driving.

4.4.2.4. Development and Opportunities of Ubiquitous systems related Hardware

4.4.2.4.1. Development of ubiquitous terminals

Also from the hardware side, a lot of equipment will have to be developed in the near future. Therefore, lucrative business opportunities for foreign companies are to be found in this segment of ubiquitous environment:

1. Ubiquitous personal terminals with sophisticated interfaces: broadband capabilities, mobility, dedicated access, a barrier-free interface and Ipv6.
2. Modular configuration of the general purpose module of the ubiquitous personal terminals:
 - Multi-access network module
 - User identity module
 - Sensing module
 - Application module
 - Operating System (OS) module

4.4.2.4.2. Development of ubiquitous chips

Various types of sensors and information storage media that could be attached to the ubiquitous system will have to be developed. Also systems that enable exchange of information by radio wave between a micro medium and a prompting device, known as a reader, will be needed in this quickly developing market segment.

4.4.2.4.3. Advent of a ubiquitous network society?

With the spreading use of mobile equipment and the diffusion of broadband services, ubiquitous networks that allow people to use network resources at any time and at any place are attracting considerable attention. The Ministry of Public Management, Home Affairs, Posts and Telecommunications (now called Ministry of Internal Affairs and Communications) announced a report by the "Study Group on Future Prospects of Ubiquitous Network Technology" in July 2002, which describes the objectives and strategies for the promotion of research and development projects designed to create an ubiquitous network society.

4.4.3. Nanotechnology

4.4.3.1. What is nanotechnology?

"Nano" means one-billionth and a nanometre (one-billionth of a metre) is the unit of measurement used to describe atoms and molecules. Nanotechnology is the science of manipulating on the atomic and the molecular level. Although this science is still in its infancy, the first nanotechnology products are already appearing on the market.

4.4.3.2. Main research areas:

Nanoelectronics: especially for computers.

The world market for such devices alone will be worth many hundreds of billions of euros. It will create super computers with much greater power for use in telephones, cars, domestic appliances and many other consumer and industrial applications currently controlled by microprocessors.

Nanobiotechnology: in particular for medical and health purposes.

Inspired by nature itself, this area will provide biosensors, biomaterials and a new breed of biochips for treating life threatening conditions, including cancer and heart diseases. Such bio-engineered devices, in the form of body implants, will deliver smart drugs or carry new cells to repair damaged tissue.

Nanomaterials: especially for nanostructured materials.

Research here will yield materials with new and improved properties for use in solar panels, anti-corrosion coatings, air purifiers and chemical catalysts. In addition, there will be new materials for optical, electronic and energy storage applications and products.

("Nanotechnology: sizing up the future", Briefings of 19/11/2002, European Commission, Research)

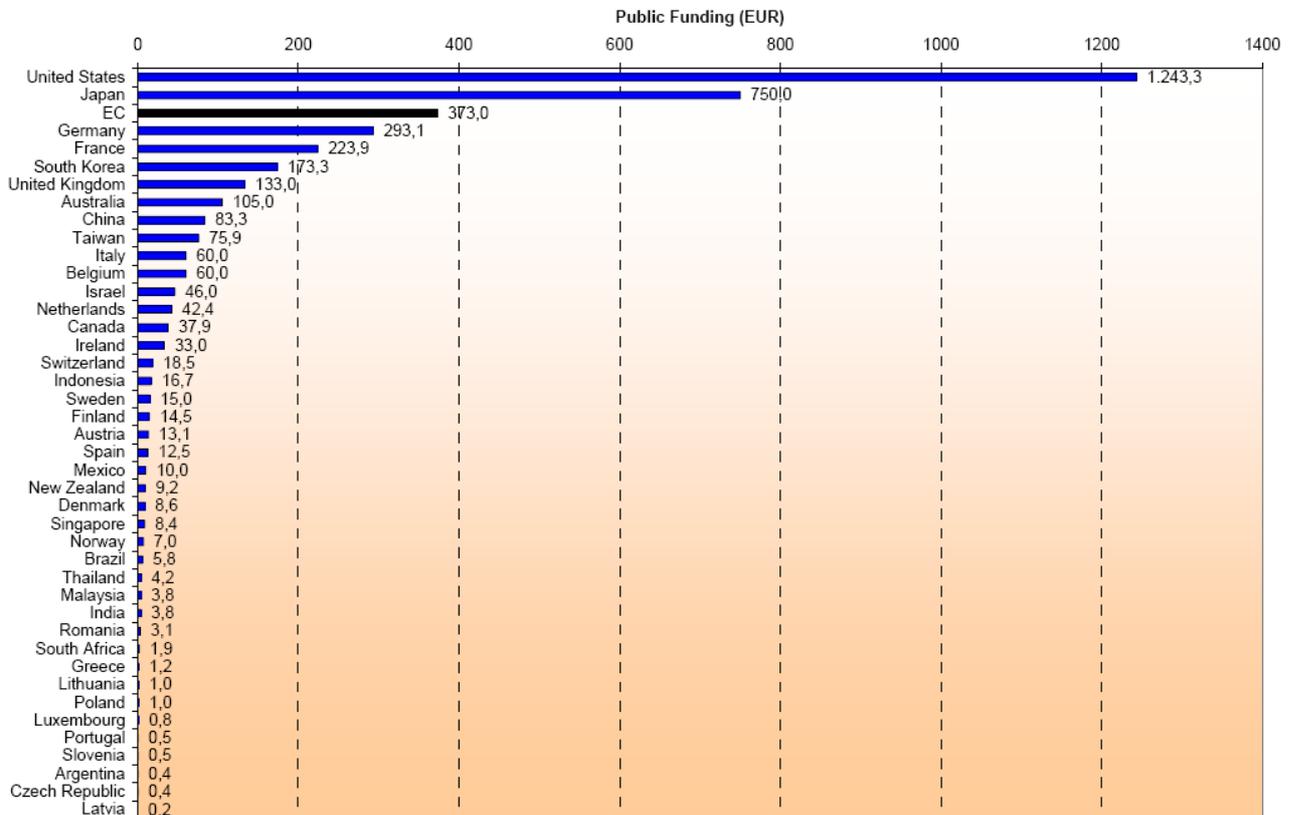
4.4.3.3. Main countries, investing in research

1. Japanese R&D spending on this technology has increased from around 110 million Euros in 1997 to 1.2 billion Euros in 2003.
2. In the past five years the EC spent from around 115 million Euros in 1997 to around 373 million Euros in 2004.
3. In the same trend, the USA invested from some 396 million to 670 million Euros in the same period.
4. Other countries, like South Korea, Australia, Taiwan and China, have all started new nanotechnology research programmes.

Exhibit 35.

Absolute world public expenditure in 2004

Source: European Commission, Research DG
8 December 2005



4.4.3.4. Nanotech - Strength and Weakness in Japan

- Long term investment in Nanotech R&D in the public and private sector results in a strong and comprehensive infrastructure
- Strong and mature industry infrastructure allows efficient technology transfer and product development
- Strong in manufacturing infrastructure and technology
- Strong in advance science and technology R & D
- New government policies encourage and assist technology transfer for product development from university and national laboratories to Japanese industry
- Japan is leading the Asia Nano Network
- Need a more global view in terms of strategy and human resource
- Need more aggressive global marketing
- Need more flexible and dynamic management
- Need intra and inter-ministry coordination and stronger interdisciplinary collaborations

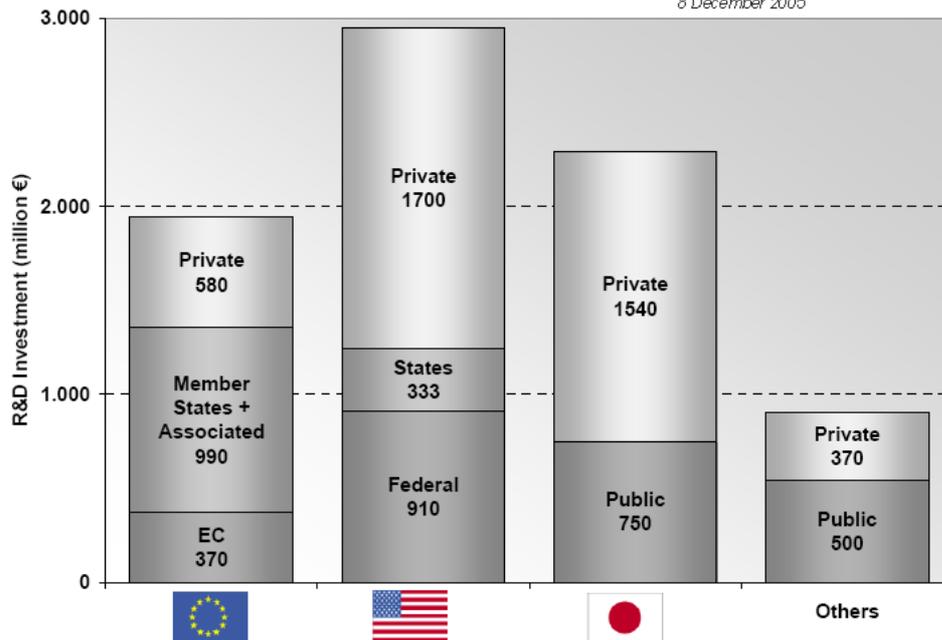
(Source: "Update on Nanotechnology Policy in the Asia Pacific Region", Lerwen Liu, PhD, 2004/11/10)

Exhibit 36.

Worldwide public and private expenditure in 2004

(private figures taken from average of Lux Research and Technology Review, US States figures taken from Lux Research)

Source: European Commission, Research DG
8 December 2005



4.4.3.5. Present applications – Holographic Memory

Present applications are new semiconductor lasers and random access memories. It is said that new materials are already being marketed: sunburn lotions containing ultraviolet-absorbing nano-particles and spectacles with scratch-resistant nano-coating. The biochip, based upon nanotechnology and biotechnology, is currently used in high throughput screening for detecting disease and gene sequencing.

There are several types of nanotechnology-based memory chip and disk drive solutions: e.g. MRAM, FRAM, Holographic memory, Molecular Memory, Nanotube RAM, MEMS-based systems, Polymer memory.

Fujitsu, Hitachi, Matsushita, NEC and several other Japanese companies are preparing products and applications based on these new nanomemory technologies.

One of the most promising products is holographic memory, a technique that can store information at high density inside crystals or photopolymers. As current storage techniques such as DVD reach the upper limit of possible data density, holographic storage has the potential to

become the next generation of storage media. The advantage of this type of data storage is that the volume of the recording media is used instead of just the surface.

Like other media, holographic media is divided into write once (where the storage medium undergoes some irreversible change) and rewritable media (where the change is reversible).

Holographic memory offers the possibility of storing 1 terabyte (TB) of data in a sugar-cube-sized crystal. A terabyte of data equals 1,000 gigabytes, 1 million megabytes or 1 trillion bytes. Data from more than 1,000 CDs could fit on a holographic memory system. Most hard drives only hold 40 to 100 GB of data, a small fraction of what a holographic memory system might hold.

(Source: http://en.wikipedia.org/wiki/Holographic_memory)

4.4.3.6. Opportunities

- Nanotechnology is revolutionary, the challenges and opportunities are huge in the information and communication area, not only for researchers and scientists but also for investors and businessmen.
- Japan is heavily investing in nanotechnology, in particular for applications in the information and communication technologies sector. The Japanese side is quite open for dialogue and cooperation, even for small novelties and maybe simple applications in this field.
- Given the apparent limitlessness of the nanotechnological area, it cannot be developed and exploited by one country. Therefore, great opportunities can be found in the sharing of knowledge about tools and techniques and in the exchange of expertise.

"Constructing devices where size is measured in millionths of a millimetre may seem like science fiction, but nanotechnology is already a reality and destined to become a multi-billion-euro market soon. The challenge for researchers is to take it from the laboratory to the commercial market-place."

(Press release of 02.10.2000 of the European Commission, Research)

5. Conditions to succeed in the Japanese market

5.1. Basic comprehension of Japanese business and its characteristics

In general, the following business practices are for computers but are also common for other products/components in the Japanese market. Some companies will only purchase from fixed suppliers meaning that suppliers have a registered business account in the purchasing and accounting department of their clients. Such suppliers are at an advantage when receiving orders.

In the above system, manufacturers used to obtain orders under favourable conditions. However, lower prices, quicker delivery and better after-sales services are more decisive nowadays than corporate related companies and registered suppliers. Computers and related products are mainly sold through distributors rather than directly by the manufacturer itself. Buyers calculate the possible demand and place orders about three months in advance.

Suppliers regularly pay visits to their users' companies, the purchasing division, the engineering and design sections, etc. to find out the user's requests and needs. At the same time, they take the opportunity to explain the characteristics and advantages of their existing and new products and make suggestions for possible applications. As for sale strategy, sometimes discounts are given to targeted users and for specific applications.

5.2. Marketing aiming at meeting the Japanese market demand

The main domestic applications have shifted from audio and video equipment and household appliances to information and communications equipment and digital household appliances. In this fast-changing environment, there are many opportunities for foreign companies to provide well-designed products that meet the Japanese users' needs.

5.3. Promising products and services

General-purpose products can only be sold here in Japan if the price of the EU company is lower (read: much lower in reality) than the normal market prices. Application-specific products that are different from the current products may succeed more easily. The same is true for services: companies that offer a truly unique service can succeed in the Japanese market place. Promising fields are:



- Next generation cellular phones
- Mobile PCs and multimedia playback devices
- Fuel cells and other power supply systems
- IP phone systems
- Optical disk storage devices
- Recycling of electronic devices and electric household appliances

Lower electric power consumption is required for next generation cellular phones, PDA's/mobile PCs, digital cameras, etc. Overseas manufacturers may enter the power supply IC's and LCD drivers market, under conditions of low price and stable supply in large volumes.

For digital TVs, car navigation systems, game units and routers there is an increase in demand for image processors, micro controllers, large capacity and high volume DRAM at low prices, ASIC's (Application-Specific Integrated Circuit) and ASSP's (Application-Specific Standard Product), such as ICs only used for communications.

As for optical disk storage devices, overseas manufacturers should better access the market of low cost pickup modules, analogue ASSP's (Application-Specific Standard Product), such as amplifiers and micro controllers, etc.

5.4. Distribution Strategy

An overseas company can appoint distributors in Japan, provide sales and technical support to them and supervise their operations from its headquarters in the home country or via a branch office located in another Asian country. Another option is to set up a Representative Office, a Branch Office or a Subsidiary Corporation.

5.4.1. Representative Offices

To set up a representative office, only a few registration documents are necessary and expenses are minimal. It is by far the easiest way to set up an entity for promoting business. However, representative offices are not permitted to perform any type of business transaction, including sales, importing, shipping or invoicing, making it not so attractive in the long run.

5.4.2. Branch Offices

1. An officially registered branch office is allowed to perform business activities that a representative office is not allowed to do.
2. However, higher costs are associated with setting up a branch office. Before starting operations, the branch company must be registered, certain fees must be paid and the government must approve certain procedures and administrative paperwork.
3. Specific procedures involve filing and registering the company's representative seal, registering tax and related expense items and submitting proxy notifications. Branch offices in Japan are usually subject to corporate income tax.

5.4.3. Subsidiary Corporations

The advantages of a subsidiary corporation over representative or branch offices are: faster arrangement of local financing, attraction of local employees and renting of office space. However, a minimum capital investment towards a Corporate Capital of 10.000.000 JPY (or approx. 74.000 Euro for a Kabushiki Kaisha, similar to Co., Ltd.) or 3.000.000 JPY (or approx. 22.000 Euro for a Yugen Gaisha, similar to Ltd.) is required as well as a full-time director in Japan. Very recently, due to ongoing deregulations and liberalizations in order to revive the sluggish Japanese economy (namely since February 1, 2003) it became possible to establish a legal commercial entity with a minimum capital of 1 JPY (or 0.01 Euro).

When actually setting up your own office or a legal local entity, the following items will be the major expenses that have to be taken into consideration:

- Preliminary Preparations (Temporary Office, Long-Stay Hotel, Registrations, etc.)
- Personnel (Expatriate, Local Staff, Temporary Staff)
- Office Set-up (Office Rent including deposit, Interior, Office equipment [Lease vs. Purchase], Office supplies, etc.)
- Operational Costs (Accounting, regulations, company cars, etc.)
- Expatriate Staff (housing, international school, etc.)
- Administrative Expenses (insurance, transport, business trips, communication, wining & dining, etc.)
- Advisor(s) (Legal affairs, etc.)
- Other costs in general

(Source: JETRO website, <http://www.jetro.go.jp/en/invest/index.html>)



In short, expect the establishment of your own legal entity in Japan to cost you a minimum of 250.000 Euro in the first year, bearing in mind the aforesaid major costs. For more details on investing directly in Japan, we refer to the regularly updated website in English of the Japan External Trade Organization (JETRO) at <http://www.jetro.go.jp/investjapan/index.html>. Here you can make an online calculation and simulation of the costs of setting up an office and/or legal entity in Japan.

5.4.4. Setting up a manufacturing facility in Japan

If a manufacturer can foresee a large Japanese market for its product, the firm should consider setting up a manufacturing facility or a manufacturing joint venture in Japan. There are two benefits of manufacturing in Japan that export and joint ventures do not render, namely:

- 1) The products can be modified easily to meet the needs of the Japanese market.
- 2) The time to market the products can be shortened.

5.5. Delivery Times and After-Sales Services

There is severe competition in price and delivery times (including the period for product development) for general-purpose products; therefore these must be set accurately and carefully.

In Japan, the development capacity and technical support are often considered more important than elsewhere in the world. The key factor here is to set up a system that enables stable supply taking into account delivery time, quantity and price, etc. regardless of market conditions.

As for after-sales service, technical support is very important. However for user suppliers' services in particular, quick responding action in case of claims are considered more important than price in certain cases. Having a local representative who can pick up the phone during business hours can be crucial.

6. General Conclusion

This study can be concluded best by a summarization of the report "The Japanese Telecom/IT market" done by Nomura Research Institute (<http://www.nri.co.jp/>).

"Due to continuing market deregulation and changes in Japanese business practices, Japan is an ideal target for foreign direct investment, with the financial and telecommunications/IT sectors currently presenting rich opportunities." (Source: Nomura Research Institute)

6.1. Why is the Japanese market attractive?

1. Japan is taking the lead in some areas like W-CDMA, mobile and broadband Internet access and ITS: Foreign companies can learn a lot on the Japanese market!
2. Japan offers a different market infrastructure than the West: You may find new opportunities to apply your services, technologies and products.
3. Japan is a gateway to other Asian markets: Marketing strategy for the Japanese market can be applied to other Asian countries: e.g. cellular phones, convenience store chains, etc.

6.2. Some opportunity fields summarized

1. The Telecom Market is promising, also in Japan
 - Even during the long-lasting economic depression, the telecom market enjoyed sound growth
 - The telecom sector is the leading industrial investment market in the whole economy
2. Growth margins remain, with high turnover per user
 - Mobile phones have become a daily necessity among younger as well as older people
 - Children and teenagers are the generation most eager to subscribe to mobile phone services and their usage rate is steadily growing
 - More than 75% of mobile phone users have changed carriers; the market has high liquidity, also for foreign newcomers. Phone number portability (from October 2006) will further increase this trend.

3. The mobile phone is one of the most important communication tools in Japan
 - Mobile phone subscribers exceed already fixed line subscribers.
 - For some considerable time, NTT Docomo, Au and Softbank (Vodafone until October 2006) have started Internet access services. A user can enjoy banking services, making a reservation, buying a ticket or doing almost anything via his or her cellular terminal.
 - 3G services are widely available, enabling more sophisticated services.
 - Communication service providers are required to take mobile phones and their users' behaviour into account.
4. Internet over satellite: Japan Satellite Corporation (JSAT), Space Communication Corporation (SCC), etc.
 - No competitive alternatives are available for NTT's services, creating a potential for high profits. ITS (intelligent transport systems) and convenience stores would be other alternatives.
5. Convenience stores, a unique Japanese (Asian) infrastructure, would be an alternative base for e-commerce transactions.
 - This ubiquitous infrastructure enables a one-stop service, 24 hours a day, 7 days a week.
 - Real time payment settlement, highly secure transaction, window to receive purchased goods, user friendly
 - Major Asian markets such as Taiwan, Thailand and Hong Kong have a similar infrastructure
6. ITS (intelligent transport system) services and car navigation products are spreading from Japan to the rest of the world
 - Vehicle Information & Communication Systems (VICS) and Electric Toll Collection (ETC), to name only a few
 - Providing information to drivers: leisure, entertainment, news, weather forecast, etc.
 - Combination of in-vehicle information devices and mobile phone communication functions open up a whole new world of opportunities.
 - With the introduction of digital road maps, Japanese car navigation manufacturers started entering other Asian countries.

6.3 Deregulation provides an all-new-playing field

Deregulation provides a new playing field making the Japanese market no longer closed and discretionary:

1. Due to recent deregulations in the IT area, foreign companies enjoy almost complete freedom when entering the second largest market in the world.
2. The "closed market" image is disappearing but it goes without saying that some cultural differences still remain.
3. Chances are present and someone might already be looking around for you as a business partner.

You do not need to limit your partnerships to the traditional telecom industry! Small venture companies are often better suited to work out a business initiative with your company.

6.4. Deregulation has a real impact on New Common Carriers (NCCs)

- Now free to enter the market as most discretionary regulations have been eliminated
- Foreign companies are welcome
- In order to survive, the traditional carriers are importing competition know-how
- The deregulation led to the grouping of players and foreign companies coming into the market
- NCCs and other Japanese companies are looking abroad for good partners

See 2.2.1. "Building a Ubiquitous Network Society That Spreads Throughout the World" regarding further government initiatives to increase competition.

6.5. A variety of partners are waiting for your arrival

6.5.1. Conventional (mobile) phone carriers

MVNO (Mobile virtual network operator) services already became available in Japan in 2001 when DDI Pocket (now Willcom) opened up its PHS networks. In the wake of the entry of new mobile phone operators, new opportunities and competition is expected in the market.

6.5.2. Competitive Local Exchange Carrier (CLEC)/Data CLEC

- In the market of financial institutions, foreign companies are becoming very competitive.
- Residential market is emerging along with penetration of the Internet.
- The Data CLEC business is very new to Japan.

- Potential partners: New Common Carriers (NCCs), convenience store chains, transportation/railroad companies, Strategic Information Systems (SIS), banks, etc.

6.5.3. Internet over cable by building a Multiple System Operator (MSO)

- Potential for high profits are surely present in this market segment
- Potential partners: Large trading companies and railroad companies

6.5.4. Cellular Internet

- Developing and/or providing applications for the 3.5G/4G services
- Potential partners: Cellular companies, IT related manufacturers, Internet Service Providers (ISPs), Strategic Information Systems (SIS), etc.

6.5.6. ITS

- System, terminal and core technology development
- Potential partners: automobile manufacturers, broadcasting companies, cellular companies, IT related manufacturers, Strategic Information Systems (SIS), etc.

6.5.7. E-commerce with convenience store chains

- Provide e-commerce services using convenience store infrastructure
- Potential partners: Convenience store chains, Internet Service Providers (ISPs), transportation companies, IT related manufacturers, Strategic Information Systems (SIS), etc.

6.6. What Japanese companies want or opportunities for foreign companies

6.6.1. Business/management skills

The globalization of the market is forcing players to adopt international standards of business administration more and more. The Japanese believe they cannot survive without such skills, which they are willing to obtain from competitive foreign companies.



6.6.2. Know-how to develop competitive services

Lacking any sense of a real competitive environment, almost all Japanese carriers have until recently failed to strengthen their basic Research & Development and many of them are therefore looking for a complementary business tie-up with European or foreign companies in this field.

6.6.3. Capital

Almost all Japanese companies are being forced to constantly reorganize and reposition themselves because of the heavy (foreign) competition. As such, many of them are willing to improve their financial positions via foreign capital injections.

Conclusion:

In the past years some major companies have entered the market and they are all trying to establish themselves as a key player in the telecommunications industry. In March 2006, Softbank Corp's take over of Vodafone's Japan unit stirred up the local and international communications industry. It is generally expected that Softbank will succeed in introducing a new, low-cost mobile phone service creating a range of new business opportunities. Although you may not be the first, it is certainly not too late!

(Source: (1) "The Japanese Telecom/IT market" from the Nomura Research Institute)

7. Appendix

7.1. Related Trade Organisations and Supervising Government Agencies

Ministry of Finance, Customs and Tariff Bureau

3-1-1 Kasumigaseki, Chiyoda-ku, Tokyo, 100-8940

TEL: +81-(0)3-3581-4111

<http://www.mof.go.jp/>

Ministry of Economy, Trade and Industry, Commerce and Information Policy Bureau

1-3-1 Kasumigaseki, Chiyoda-ku, Tokyo, 106-8901

TEL: +81-(0)3-3501-6944

<http://www.meti.go.jp/>

Distributors Association of Foreign Semiconductors

Shin-Yoyogi Bld'g 4F, 1-19-12 Yoyogi, Shibuya-ku, Tokyo, 151-0053

TEL: +81-(0)3-5350-6860

FAX: +81-(0)3-5350-6828

<http://www.dafs.or.jp/>

European Electronic Component Manufacturers Association, Semiconductors Japan Office

2-13-37 Konan, Minato-ku, Tokyo, 102-0081

TEL: +81-(0)3-3740-5120

FAX: +81-(0)3-3740-5057

<http://www.eeca.org/>

Japan Electronics and Information Technology Industries Association (JEITA)

Mitsui Sumitomo Kaijo Bldg. Annex, 3-11 Kanda Surugadai, Chiyoda-ku, Tokyo 101-0062

TEL: +81-(0)3-3518-6430

FAX: +81-(0)3-3295-8725

<http://www.jeita.or.jp/>

7.2. Distributors of Semiconductors in Japan and their products

Asahi Glass Co.,Ltd., (Semiconductor and Circuit Department)

2-26 Shimomiyabi-cho, Shinjuku-ku, Tokyo, 162-0822

TEL: +81-(0)3-5228-5911 FAX: +81-(0)3-5228-5921

<http://www.agc.co.jp/>

National Semiconductor, Agere, Fairchild Semiconductor, etc.

Fujitsu Device Inc.

POLA GOTANDA BLDG.3,9-5,Nishigotanda 8-chome,Shinagawa-Ku,Tokyo, 141-8583

TEL: +81-(0)3-3490-7396 FAX: +81-(0)3-5496-4295

<http://www.fdi.co.jp/>

Infineon Technology, Integrated Circuit System, etc.

Hakuto Co., Ltd.

1-1-13 Shinjuku, Shinjuku-ku, Tokyo, 160-8910

TEL: +81-(0)3-3225-8910 FAX: +81-(0)3-3225-9001

<http://www.hakuto.co.jp/>

HynixT

Internix Inc.

6-5-1 Nishi-Shinjuku, Shinjuku-ku, Tokyo, 163-1378

TEL: +81-(0)3-5322-1700 FAX: +81-(0)3-5322-1717

<http://www.internix.co.jp/>

Adaptive Networks, Maxim, Zilog Triscend, Cirrus Logic, etc.

Iseco Co., Ltd.

2-26-3 Kita-Magome, Ota-ku, Tokyo, 143-0021

TEL: +81-(03)-3777-3611 FAX: +81-(0)3-3777-3614

<http://www.iseco.co.jp/>

Samsung Electronics

Kanematsu Corporation Devices Company

Tsukiji-Nagaoka No. 1 Bldg., 3-4, Tsukiji 2-chome, Chuo-ku, Tokyo, 104-0045

TEL:+ 81-(0)3-3544-6531

<http://www.kdc.kanematsu.co.jp/>

Conexant System, General Semiconductor, etc.

Komatsu TriLink Ltd

Resona Shimbashi Bldg 6F, 1-16-4, Shimbashi, Minato-ku, Tokyo 105-0004

TEL: +81-(0)3-5521-2060 FAX: +81-(0)3-3502-6301

<http://www.komatsu-trilink.jp/>

SII, TI, Holtek, Hynix, Sypex, Protek, etc.

Macnica Inc.

1-6-3, Shin-yokohama, Kohoku-ku, Yokohama, Kanagawa, 222-8561

TEL: +81-(0)45-470-9870

<http://www.macnica.co.jp/>

Linear Technology, LSI Logic, TI, RF Micro devices, Lattice

Marubun Corporation

Marubun Daiya Bldg., 8-1 Nihonbashi Odenma-cho, Chuo-ku, Tokyo, 103-8577

TEL: +81-(0)3-3639-9801

<http://www.marubun.co.jp/>

TI, Motorola, Xilinx, Maxim, On Semiconductor, etc.

Uni Device Corporation

7-10-4 Nishi-Gotanda, Shinagawa-ku, Tokyo, 141-0031

TEL: +81-(0)3-3490-2173 FAX: +81-(0)3-3490-2179

<http://www.unidevice.co.jp/> (Japanese only)

Samsung Electronics

Ryoden Trading Co., Ltd.

3-15-15 Higashi-Ikebukuro, Toshima-ku, Tokyo, 170-8448

TEL: +81-(0)3-5396-6111 FAX: +81-(0)3-5396-6448

<http://www.ryoden.co.jp/>

Agilent Technology, National Semiconductor, Microchip, etc.

Shinden Hightex Corporation

Minato Bldg 3F, 1-1-12 Minato, Chuo-ku Tokyo 104-0043

TEL: +81-(0)3-3537-0101 FAX: +81-(0)3-3537-0202

<http://www.shinden.co.jp/>

Hynix

Tachibana Eletech Co., Ltd.

1-13-25 Nishi Honmachi, Nishi-ku, Osaka-shi, Osaka-fu, 550-8555

TEL: +81-(0)6-6539-8800 FAX: +81-(0)6-6539-8821

<http://www.tachibana.co.jp/>

Agilent Technology, Atmel, Altera, Macronix International

Tokyo Electron Device Ltd.

1 Higashikata-cho, Tsuzuki-ku, Yokohama-shi, Kanagawa, 224-0045

TEL: +81-(0)45-474-7000 FAX: +81-(0)45-474-7092

<http://www.teldevice.co.jp/>

AMD, Agilent Technology, Conexant System, etc.

Tomen Electronics Corporation

1-8-27 Konan, Minato-ku, Tokyo, 108-8510

TEL: +81-(0)3-5462-9611

<http://www.tomen-ele.co.jp/>

Philips, Linear Technology, ST Micro, Infineon, Atmel

Tri-star Systems Corp.

1-7-18 Nakamachidai, Tsuzuki-ku, Yokohama-shi Kanagawa, 224-0041

TEL: +81-(0)45-941-3057 FAX: +81-(0)45-941-3097

<http://www.tri-star.jp/>

Samsung Electronics, AMD, STM, etc.

Vitec Co., Ltd.

3-6-5 Higashi-Shinagawa, Shinagawa-ku, Tokyo, 140-0002

TEL: +81-(0)3-3458-4611 FAX: +81-(0)3-3458-4680

<http://www.vitec.co.jp/>

Korea Electronics

7.3. Major Semiconductor Manufacturers

Agilent Technology

9-1 Takakura-cho, Hachioji-shi, Tokyo 192-8510

TEL: +81-(0)426-60-3111 FAX: +81-(0)426-60-8489

<http://www.home.agilent.com/agilent/home.jsp?lc=jpn&cc=JP>

Altera Corporation

Shinjuku I-land Tower 32F, 6-5-1 Nishishinjuku, Shinjuku-ku, Tokyo 163-1332

TEL: +81-(0)3-3340-9480 FAX: +81-(0)3-3340-9487

<http://www.altera.co.jp/>

AMD Japan

Shinjuku Island Tower 34F, 6-5-1 Nishi-Shinjuku, Shinjuku-ku, Tokyo 163-1134

TEL: +81-(0)3-3346-7550

<http://www.amd.co.jp/>

Analog Devices Inc.

New Pier Takeshiba, South Tower Bldg, 1-16-1 Kaigan, Minato-ku, Tokyo 105-6891

TEL: +81-(0)3-5402-8200

<http://www.analog.co.jp/>

Asahi Kasei Microsystems Co., Ltd.

Shinjuku First West 16F, Nishi-Shinjuku 1-23-7, Shinjuku-ku, Tokyo 160-0023

TEL: +81-(0)3-5908-2701 FAX: +81-(0)3-5908-2720

<http://www.asahi-kasei.co.jp/akm/japanese/>

Denso Corporation

1-1 Showa-cho, Kariya-shi, Aichi 448-8661

TEL: +81-(0)566-25-5511

<http://www.denso.co.jp/>

Elpida Memory Inc.

2-2-1 Yaesu, Chuo-ku, Tokyo 104-0028

TEL: +81-(0)3-3281-1500 FAX: +81-(0)3-3281-1571

<http://www.elpida.com/>

Fairchild Semiconductor Japan Ltd.

Bancho-Kaikan 6F, 12-1 Goban-cho, Chiyoda-ku, Tokyo 102-0076

TEL: +81-(0)3-5275-8380 FAX: +81-(0)3-5275-8390

<http://www.fairchildsemi.com/>

Fuji Electric Device Technology Co., Ltd.

1-11-2 Osaki, Shinagawa-ku, Tokyo 141-0032

TEL: +81-(0)3-5435-7113

<http://www.fujielectric.co.jp/fdt/>

Fujitsu

Shiodome City Center, 1-5-2 Higashi-Shimbashi, Minato-ku, Tokyo 105-7123

TEL: +81-(0)3-6252-2220

<http://www.jp.fujitsu.com/>

Renesas Technology (= Hitachi + Mitsubishi Semiconductor)

Maru Bldg, 2-4-1 Marunouchi, Chiyoda-ku, Tokyo 100-6334

TEL: +81-(0)3-6250-5500 FAX: +81-(0)3- 6250-5469

<http://japan.renesas.com/>

Hynix Semiconductor Japan Inc.

23F SHIROYAMA TRUST TOWER, 4-3-1 Toranomom, Minatoku, Tokyo

TEL: +81-(0)3-6403-5500 FAX: +81-(0)3- 6403-5590-1

<http://www.hynix.com/>

IBM Japan, Ltd.

3-2-12 Roppongi, Minato-ku, Tokyo 106-8711

TEL: +81-(0)3-3586-1111

<http://www.ibm.com/jp/>

Infineon Technologies Japan K.K.

Gate City Osaki East Tower 21F 1-11-2 Osaki, Shinagawa-Ku 141-0032

TEL: +81-(0)3- 57457100 FAX: +81-(0)3- 57457410

<http://www.infineon.com/jp/>

International Rectifier

Sunshine 60 51F, 3-1-1 Higashi-Ikebukuro, Toshima-ku, Tokyo 170-6051

TEL: +81-(0)3-3983-0086 FAX: +81-(0)3-3983-0642

<http://www.irf-japan.com/>

Intel Corporation

Kokusai Bldg. 5F, 3-1-1 Marunouchi, Chiyoda-ku, Tokyo 100-0005

TEL: +81-(0)3-5223-9100

<http://www.intel.co.jp/>

Semiconductor Company, Matsushita Electric Industrial Co., Ltd.

1 Kotari-yakemachi, Nagaokakyou, Kyoto 617-8520

TEL: +81-(0)75-951-8151 FAX: +81-(0)75-957-9205

<http://www.panasonic.co.jp/semicon/>

Microchip Technology Japan K.K.

Yusen Shin Yokohama Building 10F, 3-17-2, Shin Yokohama, Kohoku-ku, Kanagawa 222-0033

TEL: +81-(0)45-471-6166 FAX: +81-(0)45-471-6122

<http://www.microchip.co.jp/>

Micron Inc.

4-26-16 Kouenji Minami, Suginami-ku, Tokyo 166-0003

TEL: +81-(0)3-3317-9911 FAX: +81-(0)3-3317-9917

<http://www.micron.co.jp/>

Mitsubishi Electric Corporation

2-7-3 Marunouchi, Chiyoda-ku, Tokyo 100-8310

TEL: +81-(0)3-3218-2111

<http://www.mitsubishielectric.co.jp/>

Mitsumi Electric Co., Ltd.

2-11-2 Tsurumaki, Tama-shi, Tokyo 206-8567

TEL: +81-(0)42-310-5333 FAX: +81-(0)42-310-5168

<http://www.mitsumi.co.jp/>

Motorola Japan Ltd.

3-20-1 Minami-Azabu, Minato-ku, Tokyo 106-8573

TEL: +81-(0)3-3440-3311

<http://www.mot.co.jp/>

National Semiconductor Japan Ltd.

5th Floor, Beside Kiba Bldg 2-17-16 Kiba, Koto-ku, Tokyo 135-0042

TEL: +81-(0)3-5639-7300 FAX: +81-(0)3-5639-7502

<http://www.national.com/JPN/>

NEC Electronics Corporation

1753 Shimonumabe, Nakahara-ku, Kawasaki, Kanagawa 211-8668

TEL: +81-(0)44-435-5111

<http://www.necel.com/>

New Japan Radio Co., Ltd.

3-10 Nihonbashi Yokoyama-cho, Chuo-ku, Tokyo 103-8456

TEL: +81-(0)3-5642-8222 FAX: +81-(0)3-5642-8220

<http://www.njr.co.jp/>

Nihon Inter Electronics Corporation

1204 Soya, Hadano-shi, Kanagawa 257-8511

TEL: +81-(0)463-82-1111 FAX: +81-(0)463-81-2709

<http://www.niec.co.jp/>

Seiko NPC Corporation

15-6, Nihombashi-kabutocho, Chuo-ku, Tokyo 103-0026

TEL: +81-(0)3-6667-6600 FAX: +81-(0)3-6667-6610

<http://www.npc.co.jp/>

Oki Electric Industry Co., Ltd.

550-1 Higashi Asakawa-cho, Hachioji-shi, Tokyo 193-8550

TEL: +81-(0)426-63-1111

<http://www.oki.co.jp/>

On Semiconductor

Nakameguro GS Dai 1 Bldg 4F, Kamimeguro, Meguro-ku, Tokyo 153-0051

TEL: +81-(0)3-5773-3850 FAX: +81-(0)3-5773-3905

<http://www.onsemi.com/>

Origin Electric Co., Ltd.

1-18-1 Takada, Toshima-ku, Tokyo 171-8555

TEL: +81-(0)3-3983-7111 FAX: +81-(0)3-3988-6369

<http://www.origin.co.jp/>

Philips Japan, Ltd.

2-13-37 Konan, Minato-ku, Tokyo 108-8507

TEL: +81-(0)3-3740-5167

<http://www.philips.co.jp/>

RICOH Co., Ltd. Electronic Devices Company

13-1 Himemuro-cho, Ikeda-shi, Osaka-fu 563-8501

TEL: +81-(0)72-753-1111

<http://www.ricoh.com/LSI/>

Rohm Co., Ltd.

21 Saiin Mizosaki-cho, Ukyo-ku, Kyoto-shi, Kyoto-fu 615-8585

TEL: 0+81-(0)75-311-2121 FAX: +81-(0)75-315-0172

<http://www.rohm.co.jp/>

Samsung Japan Corporation

Roppongi T-CUBE 15F, 3-1-1, Roppongi, Minato-ku, Tokyo, 106-8532

TEL: +81-(0)3-6234-2111 FAX: +81-(0)3-6234-2112

<http://www.samsung.com/jp/>

Sanken Electric Co., Ltd.

3-6-3 Kitano, Niiza-shi, Saitama 352-8666

TEL: +81-(0)48-472-1111

<http://www.sanken-ele.co.jp/>

Sansha Electric Mfg.

3-1-56 Nishi-Awaji, Higashi Yodogawa-ku, Osaka-shi, Osaka-fu 533-0031

TEL: +81-(0)6-6321-0321 FAX: +81-(0)6-6321-8621

<http://www.sansha.co.jp/>

Sanyo Semiconductor Company

1-1-1 Sakata Oizumi-cho, Oura, Gunma 370-0596

TEL: +81-(0)276-61-8341

<http://www.semic.sanyo.co.jp/>

Seiko Epson Corporation

3-3-5 Yamato, Suwa-shi, Nagano 392-8502

TEL: +81-(0)266-52-3131

<http://www.epson.jp>

Seiko Instruments Inc.

1-8 Nakase, Mihama-ku, Chiba-shi, Chiba 261-8507

TEL: +81-(0)43-211-1111

<http://www.sii.co.jp/>

Sharp Corporation

Advanced Development and Planning Center (Tenri)

2613-1 Ichinomoto-cho, Tenri-shi, Nara 623-8567

TEL: +81-(0)743-65-4321 FAX: +81-(0)743-65-1321

<http://www.sharp.co.jp>

Shindengen Electric Manufacturing Co., Ltd.

2-2-1 Otemachi Chiyoda-ku, Tokyo 100-0004

TEL: +81-(0)3-3279-4431 FAX: 0+81-(0)3-5951-6478

<http://www.shindengen.co.jp/>

Sony Semiconductor Company

6-7-35 Kita Shinagawa, Shinagawa-ku, Tokyo

TEL: +81-(0)3-5448-2111

<http://www.sony.co.jp/>

ST Microelectronics K.K.

2-15-1 Konan, Minato-ku, Tokyo 108-6018

TEL: +81-(0)3-5783-8200 FAX: +81-(0)3-5783-8216

<http://www.st-japan.co.jp/>

Texas Instruments Japan Ltd.

6-24-1 Nishi-Shinjuku, Shinjuku-ku, Tokyo 160-8366

TEL: +81-(0)3-4331-2000

<http://www.tij.co.jp/>

Toko Inc.

2-1-17 Higashi Yukigaya, Ota-ku, Tokyo 145-8585

TEL: +81-(0)3-3727-1161 FAX: +81-(0)3-3727-1176

<http://www.toko.co.jp/>

Toshiba Semiconductor

1-1-1 Shibaura, Minato-ku, Tokyo 105-8001

<http://www.semicon.toshiba.co.jp/>

Xilinx K.K.

Shinjuku Square Tower 18F, 6-22-1 Nishishinjuku, Shinjuku-ku, Tokyo 163-1118

TEL: +81-(0)3-5321-7711 FAX: +81-(0)3-5321-7765

<http://www.xilinx.co.jp/>

Yamaha Corporation

203 Matsunokijima Toyooka-mura, Iwata-gun, Shizuoka 438-0192

TEL: +81-(0)539-62-4918 FAX: +81-(0)539-62-5054

<http://www.yamaha.co.jp/>

7.4. Other Related Manufacturers (design houses, etc.)

Axell Corporation

Akihabara UDX SouthWing 10F 4-14-1 Sotokanda, Chiyoda-ku, Tokyo 101-8973

TEL: +81-(0)3-5298-1670 FAX: +81-(0)3-5298-1671

<http://www.axell.co.jp/>

Design House

Cadence Design Systems Japan

3-17-6 Shin Yokohama, Kohoku-ku, Yokohama-shi, Kanagawa

TEL: +81-(0)45-475-2221 FAX: +81-(0)45-475-2451

<http://www.cadence.co.jp/>

Design House

CoWare KK

Humax Ebisu Bldg. 9F 1-1-1, Ebisu Minami Shibuya-ku, Tokyo, 150-0022

TEL: +81-(0)3- 5768-6980 FAX: +81-(0)3- 5768-6984

<http://www.coware.co.jp/>

Design House

Faraday Technology Corporation

11-3 Nibancho, Chiyoda-ku, Tokyo 102-0084

TEL: +81-(0)3-5214-0070 FAX: +81-(0)3-5214-0076

<http://www.faraday.com.tw/>

Design House

Logic Research Co., Ltd.

Taiseihakataeki Higashi Bldg 4F, Hakataeki Higashi 1-9-11, Hakataku-ku, Fukuoka 812-0013

TEL: +81-(0)92-415-6531

<http://www.logic-research.co.jp/>

Design House

Mentor Graphics Japan Co., Ltd.

4-7-35 Kitashinagawa, Shinagawa-ku, Tokyo 140-0001

TEL: +81-(0)3-5488-3001 FAX: +81-(0)3-5488-3004

<http://www.mentorg.co.jp/>

Design House

Spinnaker Systems Inc.

Shin-Yokohama Square Bldg. 11F, 2-3-12 Shin-Yokohama, Kouhoku-ku,
Yokohama-shi, Kanagawa, 222-0033

TEL: +81-(0) 45-478-3803 FAX: +81-(0)45-478-3809

<http://www.spinnaker.co.jp/>

Design House

Thine Electronics, Inc.

Wakamatsu Bldg. 6F, 3-3-6 Nihonbashi-Honcho, Chuo-ku, Tokyo 103-0023

TEL: +81-(0)3-3270-0666 FAX: +81-(0)3-3270-0688

<http://www.thine.co.jp/>

Design House

Phenitec Semiconductor Corp.

150 Kinoko-cho, Ihara-shi, Okayama 715-8602

TEL: +81-(0)866-62-4121 FAX: +81-(0)866-63-2866

<http://www.phenitec.co.jp/>

Foundry

TSMC Japan, K.K.

21F Queen's Tower C, 2-3-5 Minatomirai, Nishi-ku, Yokohama-shi, kanagawa 220-6221

TEL: +81-(0)45-682-0670 FAX: +81-(0)45-682-0673

<http://www.tsmc.com/>

Foundry

UMC Japan

7F, Niikura Bldg., 2-2, Kandatsukasa-Cho, Chiyoda-ku, Tokyo 101-0048

TEL: +81-(0)3-5294-2701 FAX: +81-(0)3-5294-2707

<http://www.umc.com/>

Foundry

Winbond Electronics Corporation Japan

Daini-ueno Bldg. 7F, 3-7-18 Shinyokohama, Kohoku-ku, Yokohama-shi 222-0033

TEL: +81-(0)45-478-1881 FAX: +81-(0)45-478-1800

<http://www.winbond.com/>

Foundry

Amkor Technology Japan K.K.

Shinjuku Daiichi Seimei Bldg. 12F 2-7-1 Nishishinjuku, Shinjuku-ku, Tokyo 163-0712

TEL: +81-(0)3-5321-6470 FAX: +81-(0)3-5321-6471

<http://www.amkor.com/>

Subcontractor

Aoi Electronics Co., Ltd.

455-1 Kohzai Minamimachi, Takamatsu-shi, Kagawa 761-8014

TEL: +81-(0)87-882-1131 FAX: +81-(0)87-881-5575

<http://www.aoi-electronics.co.jp/>

Subcontractor

Citizen Watch Co., Ltd.

6-1-12 Tanashi-cho, Nishitokyo-shi, Tokyo 188-8511

TEL: +81-(0)42-466-1231 FAX: +81-(0)42-466-1280

<http://www.citizen.co.jp/>

Subcontractor

Hitachi Cable, Ltd.

3-1-1 Sukegawa-cho, Hitachi-shi, Ibaraki 317-0065

TEL: +81-(0)294-21-1151 FAX: +81-(0)294-24-0517

<http://www.hitachi-cable.co.jp/>

Subcontractor

Mitsui High-tec Inc.

2-10-1 Komine Yahatanishi-ku, Kitakyushu-shi, Fukuoka 807-8588

TEL: +81-(0)93-614-1111 FAX: +81-(0)93-614-1200

<http://www.mitsui-high-tec.com/>

Subcontractor

Shinko Electric Industries Co., Ltd.

80 Oshimada-machi, Nagano-shi, Nagano 381-2287

TEL: +81-(0)26-283-1000 FAX: +81-(0)26-284-8861

<http://www.shinko.co.jp/>

Genesis Technology Inc.

75 Wada-cho, Nishiwaki-shi, Hyogo 677-0052

TEL: +81-(0)795-23-6840 FAX: +81-(0)795-23-6848

<http://www.gti.co.jp/>

Test House

7.5. Major System Manufacturers in Japan (Name, Products, Factory(ies) in Japan)

- **Canon:** Copy machines, printers, digital cameras, Toride
- **Casio:** Audio equipment, PDAs, Oume
- **Clarion:** Car audio equipment, car navigation systems, Saitama
- **Fuji Xerox:** Copy machines, printers, Kanagawa
- **Fujitsu:** Cellular phones, base stations, switchboards, PCs, peripheral devices, large scale computers, LAN-related equipment, Oyama, Nasu
- **Hitachi:** Audio equipment, VTRs, TVs, PCs, peripheral devices, cellular phones, large scale computers, switchboards, Tokai, Totsuka
- **Japan Radio:** Communications equipment for industrial use, Mitaka
- **JVC:** Audio equipment, VTRs, TVs, Okurayama
- **Kenwood:** Car audio equipment, car navigation systems, Hachioji, Yokohama
- **Kyocera:** Cellular phones, printers & copiers, network components, Kyoto
- **Matsushita Communication Industrial:** Cellular phones, base stations, Saedo
- **Matsushita Electric Industrial:** Audio equipment, VTRs, TVs, household appliances, game units, PCs, peripheral devices, BS receiving systems, car navigation systems, Kadoma, Moriguchi, AVC, Denka Jukensetsu, Aircon,
- **Matsushita Kotobuki Electronics Industries:** PCs, peripheral devices, Takamatsu, Ipponmatsu
- **Mitsubishi Electric:** Audio equipment, VTRs, TVs, household appliances, cellular phones, PCs, peripheral devices, Kyoto, Himeji, Ofuna
- **Mitsubishi Heavy Industries:** Air conditioners, Nagasaki, Nagoya
- **NEC:** PCs, WSs, large scale computers, cellular phones, base stations, switchboards, LAN-related equipment, PCs, peripheral devices, Yokohama, Abiko, Fuchu, Shizuoka, Yamagata, Gunma
- **Pioneer:** Audio equipment, plasma TVs, car navigation, Shizuoka, Tokorozawa, Kawagoe
- **Ricoh:** Copy machines, printers, Ikeda
- **Sanyo Electric:** Audio equipment, VTRs, TVs, household appliances, Gunma, Osaka
- **Seiko Epson:** PCs, peripheral devices, Suwa

- **Sharp:** Audio equipment, VTRs, TVs, PCs, peripheral devices, household appliances, PDAs, Higashi Hiroshima, Tochigi
- **Sony:** Audio equipment, VTRs, TVs, game units, PCs, peripheral devices, data media, BS receiving systems, cellular phones, car navigation systems, Ichinomiya, Koda, Hamamatsu
- **Toshiba:** Audio equipment, VTRs, TVs, PCs, peripheral devices, cellular phones, household appliances, Hino, Oume, Fukaya

7.6. Related Trade Fairs and Exhibitions

CEATEC Japan

Japan Electronics Information Technology Industries Association (JEITA)

3-11 Kanda Surugadai, Chiyoda-ku, Tokyo 101-0062

TEL: +81-(0)3-3518-6421 FAX: +81-(0)3-3295-8721

www.ceatec.com/

Makuhari Messe, annually (early October)

Data Storage EXPO

Reed Exhibitions Japan Ltd.

18F Shinjuku-Nomura Bldg , 1-26-2 Nishishinjuku, Shinjuku-ku, Tokyo 163-0570

TEL: +81-(0)3-3349-8502 FAX: +81-(0)3-3349-8599

<http://www.reedexpo.co.jp/DS/en/>

Tokyo Big Site, annually (end of June)

Internecon Japan

Reed Exhibitions Japan Ltd.

18F Shinjuku-Nomura Bldg , 1-26-2 Nishishinjuku, Shinjuku-ku, Tokyo 163-0570

TEL: +81-(0)3-3349-8502 FAX: +81-(0)3-3349-8599

<http://www.reedexpo.co.jp/inj/english/>

Tokyo Big Site, annually (middle of January)

Microwave Workshops and Exhibition

Real Communications Corp.

3F Shin-Matsudo S Bldg., 1-409 Shin-Matsudo, Matsudo-shi, 270-0034

TEL: +81-(0)47-309-3616 FAX: +81-(0)47-309-3617

<http://www.apmc-mwe.org/>

Pacifico Yokohama, annually (middle of December)

Semicon Japan

SEMI Japan

4-7-15 Kudanminami, Chiyoda-ku, Tokyo 102-0074

TEI: +81-(0)3-3222-5755

<http://www.semi.org/>

Makuhari Messe, annually (early December)

Wireless Japan

Ric Telecom

3-7-7 Yushima, Bunkyo-ku, Tokyo 113-0034

TEL: +81-(0)3-3834-8134

<http://www.ric.co.jp/expo/wj2007/>

Tokyo Big Site, annually (July)

World PC EXPO

Nikkei Business Publications Inc.

2-7-6 Hirakawa-cho, Chiyoda-ku, Tokyo 102-8622

TEL: +81-(0)3-5210-8011 FAX: +81-(0)3-5210-8500

<http://expo.nikkeibp.co.jp/wpc/>

Tokyo Big Sight, annually (October)

7.7. Portable and cellular phone provider websites

NTT DoCoMo:

<http://www.nttdocomo.com/>

The English version provides general information about NTT DoCoMo.

au/KDDI:

<http://www.au.kddi.com/english/>

This site provides general information about the Ezweb mobile Internet service and links to regional sites.

Softbank Mobile (Vodafone until Oct 1, 2006):

<http://mb.softbank.jp/mb/en/>

General information about Softbank Mobile, handset models, the Yahoo! services, prices, list of shops, etc. in English and Japanese.

WILLCOM, Inc. (“DDI Pocket” until February 2005):

<http://www.willcom-inc.com/>

Japanese PHS telecommunication carrier.

Tuka (KDDI Group):

<http://www.kddi.com/tu-ka/>

This website provides information about services, handset models, prices and news. Only in Japanese.

eMobile (eAccess Group):

<http://www.emobile.jp/en/>

Corporate website of the new mobile phone carrier, expected to launch voice services nationwide in March 2008.

7.8. Governmental and other organization’s websites**Ministry of Internal Affairs and Communications:**

<http://www.soumu.go.jp/english/>

Overview of the ministry, press releases, policy reports, etc.

Ministry of Economy, Trade and Industry (METI):

<http://www.meti.go.jp/english/>

Overview of METI, policy reports, press releases, links to other governmental sites.

Telecommunications Carriers Association:

<http://www.tca.or.jp/index-e.html>

Information about the Telecommunications Carriers Association (TCA). Features monthly updated numbers on wireless subscribers in Japan.

7.9. Foreign operators websites

Verizon Business:

<http://www.verizonbusiness.com/jp/>

Overview of Verizon Business services in Japan.

Deutsche Telekom:

<http://www.telekom.co.jp/english/>

Introduction of Deutsche Telekom K.K., the Japanese subsidiary of Deutsche Telekom AG.

7.10. Major handset maker websites

Matsushita Electric Appliances:

<http://www.matsushita.co.jp/>

The site gives an outline of the group activities and products with information about wireless related products, amongst others

NEC WaiWai Mobile:

<http://www.n-keitai.com/>

Informs about wireless related products and services of NEC.

Fujitsu Limited:

<http://www.fujitsu.com/>

Overview of the company and its wireless related products.

Sharp:

<http://www.sharp.co.jp/>

Information about mobile handsets manufactured by Sharp.

Sony Ericsson Mobile Communications:

<http://www.sonyericsson.co.jp/>

Mobile Internet resources, website of the Sony Ericsson Mobile Communications Joint Venture.

Nokia:

<http://www.nokia.co.jp/>

Presentation of Nokia K.K. and its product portfolio.

7.11. Mobile Internet related companies and services

Cybird:

<http://www.cybird.co.jp/english/>

Major mobile Internet content aggregator and developer in Japan. Cybird's expertise includes planning, system development, operation, maintenance and management for services tailored for Internet enabled mobile phones and terminals.

Namco:

<http://www.namco.co.jp/>

Japanese developer of videogames, theme parks, arcade games, simulators and games for mobile Internet enabled mobile phones.

Dwango:

<http://dwango.jp/>

Solution provider for next generation network entertainment and games.

PacketVideo:

<http://www.packetvideo.co.jp/>

Provider of MPEG4 solutions for 2.5G and 3G mobile phones with a subsidiary in Japan.

Bandai Networks:

<http://www.bandai-net.com/english/>

Producer of wireless entertainment related premium content services, such as i-mode cartoon characters and "Falling in love by email", a simulation game where you correspond by e-mail with virtual girlfriends.

Mobile Media Japan:

<http://www.mobilemediajapan.com/>

English language resource on the Japanese wireless industry.

J@pan Inc.:

<http://www.japaninc.net/>

Quarterly print magazine about technology innovation in Japan. Publisher of the popular weekly email newsletters JIN and Terrie's Take amongst others.

ACCESS:

<http://www.access.co.jp/english/>

Access is the key supplier of i-mode microbrowsers.

Openwave:

<http://www.openwave.com/>

Provides the WAP microbrowsers for au/KKDI (EZweb) phones.

TEGIC:

<http://www.tegic.com/>

Tegic makes an intelligent keypad input system called T9.

Snaptrack:

<http://www.snaptrack.com/>

SnapTrack makes GPS technology for DoCoMo's DokoNavi.

Cerego:

<http://www.cerego.co.jp/>

Cerego offers mobile/online learning products based on a patented, science-based system designed to optimize knowledge acquisition and long term retention.

Wireless Watch Japan:

www.wirelesswatch.jp/

Portal site with news and commentary, focussing on the mobile space and beyond. Quite unique are their short video programmes. A subscription is required to access certain areas.

Oh! i-search:

<http://www.ohnew.com/>

Oh! i-search offers an i-Mode search engine and directory.

Mobile Contents Forum (MCF):

<http://www.mobilecontentforum.org/>

MCF arranges a variety of activities that bring together key players in the Japanese and international mobile marketplace.

ImaHima

<http://www.imahima.com/>

ImaHima is a new media company focused on mobile/online products in the media, entertainment and communications space.

Index Corporation

<http://www.indexweb.co.jp/en/>

Wireless content provider, serving every major carrier, including NTT DoCoMo, KDDI and Vodafone K.K.

7.12. List of EU Embassies in Japan

Embassy of the Kingdom of Belgium

5 Nibancho, Chiyoda-ku, Tokyo, 102-0084

TEL: 03-3262-0191 FAX: 03-3262-0651

<http://www.diplomatie.be/tokyo/>

Embassy of the Czech Republic

2-16-14 Hiroo, Shibuya-ku, Tokyo 150-0012

TEL: 03-3400-8122 FAX: 03-3400-8124

<http://www.czechembassy.org/wwwo/?zu=tokyo>

Honorary Consulate-General of the Republic of Cyprus in Tokyo

Subaru Bldg. 8F, 1-7-2 Nishi-Shinjuku, Shinjuku-ku, Tokyo 160-8316

TEL : 03-3347-2247

Royal Danish Embassy

29-6 Sarugakucho, Shibuya-ku, Tokyo, 150-0033

TEL: 03-3496-3001 FAX: 03-3496-3440

<http://www.denmark.or.jp/>

Embassy of Estonia

2-6-15 Jingumae, Shibuya-ku, Tokyo, 150-0001

TEL: 03-5412-7281 FAX: 03-5412-7282

<http://www.estemb.or.jp/>

Embassy of the Federal Republic of Germany

4-5-10 Minami-Azabu, Minato-ku, Tokyo, 106-0047

TEL: 03-3473-2350 FAX: 03-3473-4243

<http://www.tokyo.diplo.de/>

Embassy of Greece

3-16-30 Nishi-Azabu, Minato-ku, Tokyo, 106-0031

TEL: 03-3403-0871 FAX: 03-3402-4642

<http://www.greekemb.jp/>

Embassy of Hungary

2-17-14, Mita, Minato-ku., Tokyo 108-0073

TEL: 03-3798-8801 FAX: 03-3798-8812

<http://www.hungary.or.jp/>

Embassy of the Republic of Latvia

37-11, Kamiyamacho, Shibuya-ku, Tokyo 150-0000

Embassy of the Republic of Lithuania

2-11-25, Oyama-dai, Setagaya-ku, Tokyo 158-0086

TEL: 03-3703-6000 FAX: 03-5758-8281

<http://www.lithemb.or.jp/>

Honorary Consulate General of the Republic of Malta in Tokyo

c/o Nihon Seiji Sogo Kenkyujo, Kasuga Mansion #304,

1-35-15 Nishihara, Shibuya-ku, Tokyo, 151-0066

TEL: 03-3460-2392

Embassy of the Republic of Poland

2-13-5, Mita, Meguro-ku, Tokyo 153-0062

TEL: 03-5794-7020 FAX: 03-5794-7024

<http://www.poland.or.jp/>

Embassy of the Slovak Republic

2-11-33, Motoazabu, Minato-ku, Tokyo 106-0046

TEL: 03-3451-2200 FAX: 03-3451-2244

<http://www.embassy-avenue.jp/slovakia/>

Embassy of the Republic of Slovenia

7-14-12 Minami-Aoyama, Minato-ku, Tokyo 107-0062

TEL : 03-5468-6275 FAX: 03-5468-1182

Embassy of Spain

1-3-29 Roppongi, Minato-ku, Tokyo, 106-0032

TEL: 03-3583-8581 FAX: 03-3582-8627

<http://www.mcx.es/tokio/>

French Embassy

4-11-44 Minami-Azabu, Minato-ku, Tokyo, 106-8514

TEL: 03-5420-8800 FAX: 03-5420-8847

<http://www.ambafrance-jp.org/>

Embassy of Ireland

Ireland House, 2-10-7 Kojimachi, Chiyoda-ku, Tokyo, 102-0083

TEL: 03-3263-0695 FAX: 03-3265-2275

<http://www.irishembassy.jp/>

Embassy of Italy

2-5-4 Mita, Minato-ku, Tokyo, 108-8302

TEL: 03-3453-5291 FAX: 03-3456-2319

http://www.ambtokyo.esteri.it/ambasciata_tokyo/

Embassy of the Grand-Duchy of Luxembourg

Luxembourg House 1F, 8-9 Yonbancho, Chiyoda-ku, Tokyo 102-0084

TEL: 03-3265-9621 FAX: 03-3265-9624

<http://www.luxembourg.or.jp/> (“contents are being renewed”)

Royal Netherlands Embassy

3-6-3 Shibakoen, Minato-ku, Tokyo, 105-0011

TEL: 03-5401-0411 FAX: 03-5401-0420

<http://www.oranda.or.jp/>

Embassy of the Republic of Austria

Moto-Azabu, Minato-ku, Tokyo, 106-0046

TEL: 03- 3451-8281 FAX: 03-3451-8283

<http://www.austria.or.jp/>

Embassy of Portugal

Kamiura-Kojimachi Bldg., 5F 3-10-3 Kojimachi, Chiyoda-ku, Tokyo, 102-0083

TEL: 03-5212-7322 FAX: 03-5226-0616

Embassy of Finland

3-5-39 Minami-Azabu, Minato-ku, Tokyo, 106-8561

TEL: 03-5447-6000 FAX: 03-5447-6042

<http://www.finland.or.jp/en/>

Embassy of Sweden

1-10-3-100 Roppongi, Minato-ku, Tokyo, 106-0032

TEL: 03-5562-5050 FAX: 03-5562-9095

http://www.swedenabroad.com/pages/start_4001.asp

British Embassy

1 Ichibancho, Chiyoda-ku, Tokyo, 102-8381

TEL: 03-5211-1100 FAX: 03-5275-3164

http://www.uknow.or.jp/be_e/

7.13. Bibliographic References

Computers & Components

- Jetro Japanese Market Report No. 61, March 2002
Regulations & Practices, Electronic Components
- Nikkei Net (Japanese and English)
Computer, Technology, Telecommunications, www.nni.nikkei.co.jp

Convergence

- Worldwide Progress in the Convergence of Telecommunications, Information Technology and Broadcasting: The tasks Facing Japan, by Takeshi Shinohara and Yasutake Okano
Nomura Research Institute, Ltd
- The Future of the Interactive Digital Media Industry, by Toshitada Nagumo
Nomura Research Institute, Ltd

e-Commerce

- "Electronic Commerce: EU policies and SMEs",
by Anne Troye-Walker, European Commission, DGIII
- Electronic Commerce; Books and Music CDs, Regulations & Practices
Japanese Market Report No. 53, March 2001, JETRO
- Business-to-Business Electronic Commerce, Regulations & Practices
Japanese Market Report No. 49, November 2000, JETRO
- IC Cards Integrated Circuit Card and EC (Free translation by Pan Office Inc.)
Nomura Research Institute

e-Learning

- E-Learning to Create Knowledge and Business
by Shintaro Maeda, Nomura Research Institute, Ltd

e-Management

- The CIO as the Driving Force Behind IT Restructuring
by Koki Yodokawa, Nomura Research Institute
- Becoming an E-Company: A Strategy for Doing Net Business, by Hiroshi Matsuno
Nomura Research Institute, Ltd
- "Arbitrage-Type" Business Models: An Innovative Strategy for Large Companies, by NRI Business
Strategy Consulting Department, Nomura Research Institute, Ltd
- Innovative Business Models in the Era of Ubiquitous Networks, by Toshitada Nagumo, NRI Papers No.
49, June 1, 2002, Nomura Research Institute

EU-related

- eGovernment in the Member States of the European Union, 5th Edition May 2006
- Electronic Europe is doing Fine but needs new impetus, by Erkki Liikanen, Industry and Technology - Winter 2002, European Affairs.
- EU aims to Match U.S. in information Technology, by Piia-Noora Kauppi, Trends in Information Technology, Special report - Spring 2001, European Affairs

Interactive TV

- Japan - Broadcasting - Satellite and Interactive TV, Paul Budde Communication Pty Ltd. September 2004
- Mobile Broadcasting Service (MobaHO!), <http://www.mbco.co.jp>
- Industry pins hopes on digital TV, NikkeiNet, February 24, 2003
- Braving the Interactive TV Concept, J@pan Inc. February 2001

IT in general

- Present Status and Future Perspective of ICT in Japan (June 2004), Ministry Of General Affairs
- The IT Industry, by Manufactured Import Promotion Organization (Mipro)
- Internet subscriber numbers, <http://www.internetworldstats.com/>
- Information & Communications in Japan 2003, InfoCom Research, Inc., Tokyo, Japan
- "From nanotechnology to new production systems", Hervé Péro, DG Research – EC, July 2003
- JETRO, Publications, Others
- Information-technology Promotion Agency, Japan, [<http://www.ipa.go.jp/index-e.html>]

Japanese Government

- White Paper 2002, 2004, 2005, Information and Communication in Japan
Ministry of Public management, Home Affairs, Post and Telecommunications, Japan
- IT Basic Strategy, The Sixth Strategy Meeting, Prime Minister's Bureau, www.kantei.go.jp

Mobile Phones

- "Japan's Mobile Content Industry", Japan Economic Monthly, JETRO, December 2004
- Squeezing a 3.2-Mpixel CCD into a Mobile Phone, Nikkei Electronics Asia, Aug 2004

Smart cards

- Hitachi Smart Card Solution, www.hitachi.co.jp
- From Ticket Reservations to Phones as Tickets and Money, by Jeffrey L. Funk, J@pan Inc
- Sony, Contactless IC Card Technology, Feb 2006

Statistics

- Internet Statistics, Ministry Of General Affairs
- Internet users in Japan, Nielsen NetRatings, http://www.netratings.co.jp/US/monthly_Usage.htm
- Production, Imports and Exports of Electronics in Japan, Nov 2004 <http://www.jeita.or.jp>

Strategies

- New Opportunities versus Old Mistakes: Foreign Companies in Japan's High Tech Markets, by Gerhard Fasol, Eurotechnology Japan KK
- Market Strategy in the Era of Ubiquitous Networks, by Hisao Nakajima, Nomura Research Institute

Surveys & Experiments

- Cyber Life Observations, Study on the Japanese Consumers' Use of Information & Telecommunications Equipment and Services, the 12th Survey, Nov. 20, 2002, Nomura Research Institute, Ltd.
- Integrating IT into Daily Life: Findings from NRI's Cyber Life Observations Surveys, by Juro TODA, NRI Papers No. 17 November1, 2000, Nomura Research Institute
- Social Experiments Involving the POSTUB Electronic Post, by Takahashi Sasaki, Nomura Research Institute, Ltd
- Local-Area Intranet and Community Solutions: The CTTH Ryokuen Toshi Experiment by Chikashi Shimura, Nomura Research Institute, Ltd

Telecoms

- NTT Docomo fact book March 2006
- 2004 Asia - Telecoms in Japan, Paul Budde Communication Pty Ltd., July 2004
- White Paper 2002, 2004, 2005, Information and Communication in Japan Ministry of Public management, Home Affairs, Post and Telecommunications, Japan
- Main Data on Information and Communications in Japan, Ministry of Internal Affairs and Communications, October 2004
- Service Overview & Number of Contracts (in Japanese), NTT East, November 2004
- The unofficial independent i-mode FAQ, Eurotechnology-Japan, <http://www.eurotechnology.com>
- 4G/Mobile Phone Firms Link for New High-Speed Standard, <http://www.reuters.com>, December 30, 2004

Ubiquitous Networks

- Using Ubiquitous Networks to Create New Services Based on the Commercial and Public Infrastructure, by Michio Kitamura, Nomura Research Institute, Ltd
- Creating a Ubiquitous Networking Market: Information Appliances, by Akira Otsuka Nomura Research Institute, Ltd
- Creating a Ubiquitous Networking Market: Mobile Phones, by Ichiro Morimoto Nomura Research Institute, Ltd
- Innovative Business Models in the Era of Ubiquitous Networks, by Toshitada Nagumo NRI Papers No. 49, June 1, 2002, Nomura Research Institute
- Ubiquitous Networking: Towards a New Paradigm, by Teruyasu Murakami and Akihisa Fujinuma, NRI Papers No. 2, April 1, 2000, Nomura Research Institute

7.14. HS-Codes

Harmonization System-Code (HS):

Each year, millions of trade transactions occur. Because these transactions are comprised of approximately 8,000 different products, every item that is exported is assigned a unique 10-digit identification code. The **Harmonization Code System (HS-Code)** is a system of progressively more specific identifiers for a commodity.

The code is made up of a series of numbers, with the first two digits indicating a broad category. For most computer-related devices, the first two digits are 84, referring to the broad category of “Nuclear reactors, boilers, machinery and mechanical appliances; parts thereof.”

A 4-digit identifier is assigned. For example, “Automatic data processing machines and units thereof; magnetic or optical readers, machines for transcribing data onto data media in coded form & machines for processing such data keyboard, printer, scanners, disk drives, power supply” are assigned 8471.

For more specification, a 6-digit identifier is assigned (e.g. 8471.10 for analogue or hybrid computers). Further numbers indicate other specific information about the exporter.

List of 4-digit numbers and their 6-digits

8470 calculating & account machines, cash registers, etc.

8470.10 Electronic Calculators, Operation Without an External Source of Power

8470.21 Electronic Calculating Machines, Incorporating a Printing Device

8470.29 Other Electronic Calculating Machines

8470.30 Other Calculating Machines

8470.40 Accounting Machines

8470.50 Cash Registers

8470.90 Other Machines, Incorporating a Calculating Device

8471 Automatic data process machines, magn reader, etc. computer hardware

8471.10 Analogue or Hybrid Automatic Data Processing Machines

8471.20 Digital Automatic Data Processing Machines

8471.91 Digital Processing Units

8471.92 Input or Output Units

8471.93 Storage Units

8471.99 Other Data Processing Machines

8472 Office machines nesoi (hectograph, addressing, etc.)

8472.10 Duplicating Machines

8472.20 Addressing Machines and Address Plate Embossing Machines

8472.30 Machines for Sorting or Folding Mail or for Inserting Mail in Envelope

8472.90 Other Office Machines

8473 parts etc for typewriters & other office machines computer accessories

8473.10 Parts and Accessories of Typewriters and Word-processing Machines

8473.21 Parts and Accessories of the Electronic Calculating Machines

8473.29 Parts, Accessories, of Machines Incorporating a Calculating Device

8473.30 Parts and Accessories of the Automatic Data Processing Machines

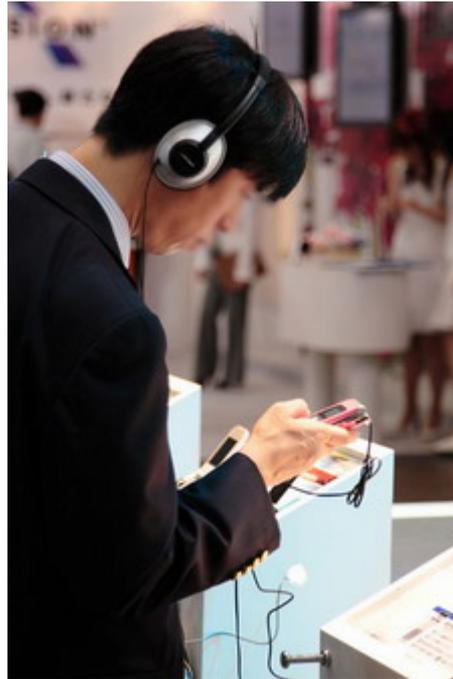
8473.40 Parts, Accessories, of Duplicating Machines, or Other Office Machines

7.15. Visual Impression of Wireless Japan 2006 Trade Fair

Some photographs of Wireless Japan 2006 (Tokyo Big Sight). Courtesy Keitai Watch (<http://k-tai.impress.co.jp>) and Nikkei Net IT Business and Industry (<http://it.nikkei.co.jp>).



Docomo's new SO902iWP made by Sony Ericsson. It boasts a quarter VGA TFT LCD screen and has a built-in smart card for electronic payments (osaifu keitai)



Many young Japanese are nowadays using their mobile phone as a high-quality mp3 audio player.

NTT DoCoMO and High Tech Computer Corp. presented their new pocket PC, running Windows Mobile 5.0. The dual-mode W-CDMA and GSM/GPRS mobile phone comes with a 2.0 megapixel CMOS camera, IEEE802.11b/g wireless LAN and Bluetooth.



Au demonstrates a working fuel cell prototype made by Hitachi. The cell is still about the same size as the phone itself.



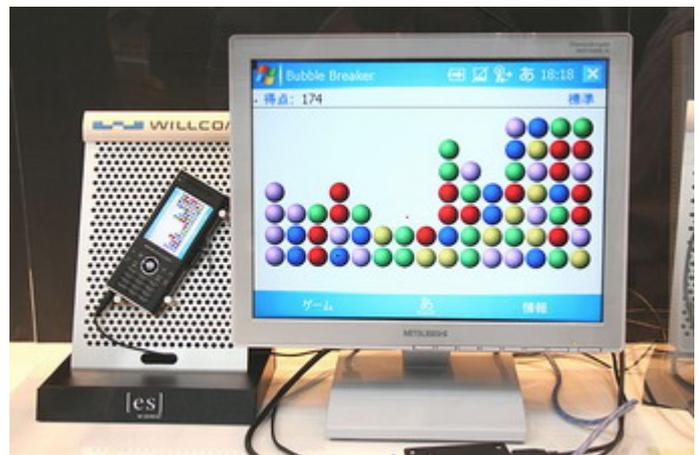
Demonstration of another new type of fuel cell, already small enough to be carried around.



Phones equipped with a smart card used for building access control. The door unlocks by waving the phone in front of the control panel.



Willcom presented Sharp's W-Zero3 [es] Windows Mobile smartphone, featuring pocket versions of the Office suite, Windows Media Player, a PDF viewer, etc. It even runs Skype and some of your favourite games.



Vodafone's 905SH mobile phone allows you to view "One-Seg" digital terrestrial TV broadcasts on a widescreen display. These phones come with Sharp's high-quality Aquos LCD screens.



(Source pictures: RIC Telecom, <http://www.ric.co.jp/expo/wj2006/post/report.html>)