KEIZAI KOHO CENTER
JAPAN INSTITUTE FOR SOCIAL AND ECONOMIC AFFAIRS

JAPAN ECONOMIC CURRENTS
A COMMENTARY ON ECONOMIC AND BUSINESS TRENDS

Towards the Emerging Ubiquitous Networks Society

by Masayoshi Yamashita, NTT USA

Japan and the United States face three similar trends in telecommunications as wireless technology advances and the Internet Protocol (IP) becomes the mainstream protocol:

(1) With growing usage of mobile phones, the role of "primary telephone" has been increasingly shifting from fixed-line phones to mobile phones;

(2) The role of the mobile phone is becoming less of a traditional simple voice telephone, but more of an information terminal, which carries various applications such as voice, data, imaging, etc;

(3) Conversely, PCs, the popular application of which has been "data" communications such as e-mails, text messages, graphics or videos, are becoming capable of "voice" communications – once the sole function of a POTS ("Plain Old Telephone Service"). At the same time, IP technology has been changing fundamentally the way people communicate, expanding communications applications almost limitlessly, leading us to a ubiquitous networks society.

Internet Protocol (IP) as the mainstream technology

The core base technology of the traditional telecommunications has long been "circuit switching," which first establishes a path to connect the point-to-point, whereby the data (voice or data) is transmitted. By contrast, the IP based telecommunications sends out so-called "packets" of data without initially establishing a dedicated path. These packets reach their destination via various paths over various internet networks worldwide. In the past, IP was perceived as less reliable technology than circuit switching, with no guarantee in the speed and quality of transmission. But as IP has advanced, the technology has been vastly improved. And, because IP networks are more efficient and flexible, IP is now largely the technology of choice.

In circuit switching, the farther the distance of transmission path, the more switches the data has to pass through, and the longer the duration of connection, the longer the transmission path must be dedicated to that particular communication. Thus in circuit switching, "distance" and "duration" of connection largely determine the cost of communication service. But IP based connections do not go through a dedicated path via expensive circuit switches. Instead, using inexpensive IP routers, traffic is sent over multiple paths shared with the packets of other communications, so "distance" (whether long or local) and "duration" do not matter. Services can therefore be provided more efficiently and inexpensively than circuit switching.

The IP protocol can carry various applications such as voice conversations, emails, instant messages, web surfing and video regardless of types of transmission "pipes" – fixed-line, mobile, cable TV, satellites. Moreover, IP enables the addition to "voice" of new features such as unified message or a bundling of IP telephony and broadband service, thereby expanding the functions normally expected in conventional telephones.

Towards the Emerging Ubiquitous Networks Society

Japan's broadband is the world's fastest and least expensive

Although the IP technology is becoming the mainstream technology in both Japan and the US, as described above, the situation in each country with respect to this technology is not the same, due to different telecom industry histories, regulatory policies and systems.

In the US, two-thirds of all broadband is provided by cable TV companies; the remaining one third is provided by telecom companies. While 70 percent of US households have cable TV, the relatively long distance between telecom switches and homes has made difficult DSL (Digital Subscriber Line) deployment because the DSL transmission speed declines in proportion to the distance. As a result, fewer DSL providers operate, facing less competition among DSL providers than Japan. This has resulted in relatively higher prices. Super high-speed DSL service with a maximum of 40 megabits per second, as seen in Japan, has not yet begun.

In its so-called "e-Japan strategy" set in 2001, the Japanese government set a goal to make Japan would become the world's most advanced IT nation by 2005[i]. An all-out strategic effort has been made by both the government and the private sector. Furthermore, because of the high-quality and well-maintained telecom networks infrastructure made available by NTT to new entrants, many new DSL providers have entered the market, thereby creating the fiercely competitive market where providers are competing in the speed, rates and quality of service.

Today Japan's monthly broadband price on the basis of megabit per second is the lowest in the world, contributing to the rapid growth of broadband usage[ii]. As of February 2004, Japan's overall broadband subscriber is approximately 14.5 million. Of those, DSL constitutes 10.9 million, or 75 percent. Moreover, Fiber-to-the-Home (FTTH), using fiber optics, increased 4.3-fold during the single year 2003. Currently, the number of FTTH subscriptions has passed one million, placing full-scale optical fiber deployment in Japan ahead of the US.

Japan's Internet usage via mobile phones is the highest in the world

By late November 2000, the number of mobile phone subscribers in Japan had surpassed those for fixed-line phones. By March 2004, it reached 86.6 million – the ratio between fixed-line and mobile phones in Japan is two to three, while in the US the ratio is three to two, with fixed-line phones still outnumbering mobiles.

In Japan, as of March 2004, the number of Internet connection service subscribers via mobile phones reached 69.7 million, representing 80 percent of all mobile phone subscribers, the world's highest level of Internet connection via mobile phones. Internet usage via mobile phone includes e-mail, news/entertainment information services, downloading musical ringing tones, images and games, ticket purchasing, banking transactions, and the like.

In particular, there has been a rapid expansion of cameras embedded mobile phones that can receive and send images via internet in Japan. As of September 2003, these constituted 48 percent of all mobile phone subscribers, meaning every one out of two mobile phones is equipped with a camera. Ever since the W-CDMA service was launched, ahead of the rest of the world, the number of third-generation (3G) mobile phone subscribers has been growing steadily, reaching 16.7 million as of March 2004, that is almost 20 percent of all mobile phone users[iii].

VOIP has been expanding rapidly in Japan's consumer market

Following the rapid expansion of broadband users, Voice-Over-IP (VOIP), which uses broadband access such as DSL, has been growing rapidly, now reaching the 4

million subscribers in Japan. VOIP, which has advantages such as more features and relatively less inexpensive provisioning costs compared with circuit-switched phones, is now available at about 8 yen (about 7 cents) for three minutes everywhere in Japan, and calls between subscribers of the same provider are offered free of charge by many VOIP providers.

In the US, small new venture businesses have launched VOIP services for consumer market ahead of large telecom carriers. Although the number of subscribers is still limited in consumer market, significant growth is expected this year as major long distance telecom companies and local Bell telecom companies inaugurate new VOIP service for home users.

Emerging new promising technologies

There are two emerging technologies worth noting that are being actively developed and promoted in both Japan and the US.

(1)Wireless tag (RFID) - Improved Visibility RFID (Radio Frequency Identification) tag, a super-small IC chip that contains data attached with a super-thin antenna to exchange data, has been rapidly adopted in both Japan and the US. RFID technology that enables nearly simultaneous read/write of identification data of each tag without contact or line-of-sight improves efficiency in wide range of applications such as manufacturing/ inventory management, distribution management, point of sale transactions. Moreover, sharing the data with multiple organizations via the Internet network empowers its potential.

The US Department of Defense and the US large retail chains have launched pioneering trials. Although new rules may be required to ensure information security and to protect privacy is a prerequisite, this technology has extremely large potential.

(2)IPv6 - connection between every conceivable person and devices IPv6, the next generation internet protocol, has a virtually infinite (2^{128}) number of IP addresses (identifiers for a computer or device on IP network). Therefore, an IPv6 address can be assigned to any kind of device including home appliances, enabling direct connection between end-user terminals (so-called Peer-to-Peer connection) without via servers or direct access onto IPv6 assigned devices at home from outside. IPv6 has other improvements over IPv4 (the current generation of IP), such as enhanced internet security through embedded encryption/authentication mechanism, or built-in address auto-configuration and "plug-and-play" feature that facilitates easy deployment of Internet-enabled home appliances.

Japan is now positioned as a world leader in adopting IPv6

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[i]The target was the establishment of a constantly accessible environment where at least 30 million households could access a high-speed Internet network and for 10 million households could access a super high-speed Internet network. As of October 2002, some 35 million households had access to high-speed Internet (DSL) and approximately 23 million had access to cable internet, and approximately 16 million had access via FTTH to the super-high speed Internet network. These initial targets have been greatly surpassed.

[ii]Comparing DSL and cable Internet charges per 100 kilobits/second: the monthly cost in Japan is $0.09 and $3.53 in the US (ITU Internet Report, September 2003).

[iii]Following the introduction by NTT DoCoMo in October 2001 of third-generation mobile phones (3G), using the W-CDMA technology, all three of Japan's mobile phone companies launched 3G services, competing with each other.

[iv]In November 2002 the NTT Group announced the "Vision for a new optical generation -- Broadband leading to the world of resonant communication," which provided an overview of and our vision for the full-scale Broadband Ubiquitous era that would be brought about by optics in the next five years through the next-generation optical fiber network called RENA.

Sustaining "The Best Relations Ever"

by Brad Glosserman, Pacific Forum CSIS

In recent weeks, Japan and the United States have commemorated the 150th anniversary of the signing of the Kanagawa Treaty, the agreement that officially marked the beginning of diplomatic relations between the two countries.

There are good reasons to celebrate: this diplomatic odyssey began with the arrival of Commodore Perry's "black ships," traversed several world wars – one, an especially vicious conflict that pitted our two nations against each other – and yet has culminated in "the best relations ever" between the two countries. Unlike the cherry blossoms that bloomed in both nations at the time of the celebrations, the alliance that the two governments built during the postwar era has endured and flourished.

A strong US-Japan relationship is critical to stability in East Asia. The security alliance provides the foundation for American engagement in the region. At the same time, it has established a framework for Japan to assume a higher security profile in Asia. The Japanese national security establishment has been virtually transformed in the 13 years since the first Persian Gulf War. Remarkably, there has been little or no complaint from its neighbors during that process. Credit the bilateral alliance for helping to assuage fears about Japanese intentions.

Representing over one-third of the global economy, our two nations can marshal unrivaled economic power when they choose to work together. The global partnership established over a decade ago provides another framework for action. Japan has taken up the challenge by leading international efforts to help rebuild Afghanistan, by co-chairing the Conference on Peace and Development in Sri Lanka, and by pledging $5 billion to help Iraq.

> "A strong US-Japan relationship is critical to stability in East Asia. The security alliance provides the foundation for American engagement in the region. "

There is no guarantee that this happy state of affairs will continue. In the last decade alone, the alliance has endured "Japan bashing," "Japan passing," "Japan nothing," and is now, reports Ralph Cossa, the president of Pacific Forum, enjoying "Japan surpassing" as Tokyo manages to surpass the expectations of friends and supporters in Washington.

With relations at their current peak, a cynic would note they can only go down from here. Japan in particular faces three sets of challenges: short-, medium- and long-term.

Challenges Ahead

Short-term concerns reflect political conditions in Japan. Prime Minister Junichiro Koizumi has made a bold decision – in keeping with his character – and pushed for the first overseas deployment of Self-Defense Forces without UN authorization in postwar history. The prime minister is to be applauded for his courage and his understanding that the people of Iraq need international support at this perilous moment. He also understands the risks that accompany this move. The possibility of casualties is real both in Iraq and at home. As I write, three Japanese citizens have been taken hostage in Iraq and their kidnappers have demanded the withdrawal of the Self Defense Forces in exchange for their freedom. The Koizumi government has stuck to its principles, rightfully arguing that any concessions to the terrorists would

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only encourage more such outrages in the future.

The prime minister has said that Japanese forces are in Iraq to help the Iraqi people. He has also maintained that Japan has responsibilities as a leading nation; participation in the US-led coalition is a way for Japan to shoulder those burdens. He is right. But there are others who believe that the prime minister is only following the US; still others argue that Tokyo must support the U.S in Iraq to ensure Washington's support for Japan when dealing with the thorny issue of North Korea.

Both claims are wrong, and in both cases, it appears as though the US has put Japan in harm's way. Those arguments are leftovers from a time when Japan needed gaiatsu (foreign pressure) to make difficult decisions. That time has passed. If the Japanese people don't understand that their government is acting in their national interest – or they somehow believe that is the US' fault if and when tragedies occur – then the public trust that girds the alliance will dissolve, and the alliance itself will collapse.

In the medium-term, Japan has to create the legal and political framework that will allow the alliance to respond to a new international environment and Japan to shoulder those responsibilities. This process has been underway for over a decade and significant progress has been made: the 1996 Joint Security Declaration and the emergency legislation that passed the Diet last year are two important milestones. But more needs to be done.

Missile defense (MD) in particular will obligate Japan to make important changes in security thinking and how Tokyo responds to emergencies. A ballistic missile launched from North Korea has a flight time of 6-10 minutes. Existing procedures – convening a Security Council meeting and then a Cabinet meeting, which will take 30 minutes at a minimum, to authorize a response – cannot protect Japan. The decision to respond must be made before an attack, which means devolving authority to respond to the interceptor battery commander (which really means going "automatic.") Such a transfer of authority has been taboo in postwar Japan.

It also means that the debate about collective self-defense (i.e. could Japan respond to a launch that merely flies over the islands and is heading toward the US) is pointless: there wouldn't be time to figure out what the ultimate target is. That constitutional issue of collective self-defense has to be addressed directly and is one of the most important legal challenges Japan faces in the years ahead.

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Sustaining "The Best Relations Ever"

"…Japan should learn to speak more clearly in terms of national interest. Prime Minister Koizumi does that, but his is a voice in the wilderness."

Participation in the US missile defense program also means Japan will have to change rules governing the exports of arms and weapons components. Tokyo's desire to build parts of the MD system will require exports in the near future; those prohibitions render Japan's industrial contribution meaningless. Similarly, before the US entrusts the protection of its forward-deployed forces to Japan it will have to have complete faith in Japanese planning and procedures. To gain that kind of trust – knowing that Japan can and will respond and the system will work – Japan will have do embrace a level of transparency in security planning and systems design that it has been reluctant to adopt to date.

The long-term challenges are structural in nature. The most important is the country's changing demographic profile. Japan is one of the world's most rapidly aging countries. A "graying" Japan will have different priorities. An older population is going to prefer to spend more of its money on domestic concerns, in particular health care, rather than, say, expensive weapons systems. Every country faces those choices, naturally, but Japan's dilemmas will be even more acute after a prolonged period of less than robust economic growth.

The opportunity costs of a higher security profile will be greater in Japan – not only in terms of money, but in terms of human capital as well. The more personnel the country dedicates to national security issues – whether it is in the form of a military, diplomatic personnel, or participants in other overseas endeavors – the less who are available for domestic concerns. It is difficult to quantify the extent to which this is an issue, but it suggests that there will be tough choices affecting Japan's ability to interact with the world, and these will constraint its capacity to act in partnership with the US.

Of course, all the issues are not on the Japanese side. The US must learn to act more like a partner and less like a hegemon: it must learn to genuinely consult, rather than offering allies a stark choice (if even that). The US failure to learn how to truly lead will alienate friends and allies around the world.

More worrisome are the consequences of a failure to get our economic house in order. The massive debt that the federal government has run up in the last three years means that our global position will be even more burdensome. Economists warn that the US will be more than $2.4 trillion in debt ten years from now and that figure is only a sliver of real US future liabilities: if pensions, social security and other "hidden" obligations is factored in, the net present value of unfunded liabilities over the next 75 years will be more than $50 trillion – five times US GDP.

"…Tokyo and Washington should renew their commitment to the alliance. A new joint security declaration would help lay out the rationale for the bilateral partnership, explaining to citizens of both countries and other concerned governments how the two nations are working together and why."

Like it or not, the US is an imperial power – even if it does not have an empire. The costs of maintaining stability are growing as the US goes deeper into debt. The US is in danger of being dangerously overextended.

> "It has been a tumultuous 150 years; the next century and a half is likely to have even more ups and downs."

There are no simple remedies for these long-term problems. In the interim, there are three things the two countries can do to ensure that the relationship does not slide and can help safeguard regional security. First, Japan should learn to speak more clearly in terms of national interest. Prime Minister Koizumi does that, but his is a voice in the wilderness. This language and vocabulary are much at odds with postwar Japanese history, but it is time the rest of the nation learned to use and feel comfortable with them.

Second, Tokyo and Washington should renew their commitment to the alliance. A new joint security declaration would help lay out the rationale for the bilateral partnership, explaining to citizens of both countries and other concerned governments how the two nations are working together and why.

Third, Japan and the US must ensure that the workings of their alliance are transparent. That means engaging other governments in the region in discussions and strategic dialogue to identify areas of common concern and to find ways to work together to solve shared problems.

It has been a tumultuous 150 years; the next century and a half is likely to have even more ups and downs. The Japan-US alliance could survive them all, but only if the partnership is carefully tended. In other words, enjoying "the best relations ever" means the job is just beginning. ■

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technology, developing IPv6 based home appliances, launching a variety of trials, aided by various government-supported programs.

Broadband and ubiquitous network

One of the unique societal problems Japan faces is a declining birthrate coupled with a growing aging population. In a full-scale broadband environment utilizing the optical access network, real time communication through end-to-end, interactive, high-quality and security guaranteed visual communication will become possible, overcoming "time" and "distance" to provide services and applications targeted specifically to the requirements of that group. For example, It would be possible for medical doctors to check on senior citizens remotely in a broadband environment, leading to the reduction of social cost in the aging society. The realization of full-scale broadband environment will serve to address Japan's unique societal issues[iv] .

Finally, it will be important for both Japan and the US to further develop their advanced broadband/ mobile technology and infrastructure, including IPv6 and RFID, in order to realize the "ubiquitous network society" where people will be connected "anytime, anywhere and with anyone or anything," without being subject to a variety of constraints, relating to geography, types and number of devices, and conventional networks.

In that way, Japan and the US will be a model for the rest of the world. ■

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