

Who needs a next-generation network, anyway?

Insatiable Japanese consumers will be the first to show you . . .

Ten years ago, Japan changed the mobile world with the introduction of i-mode. Now, they are ready to change the world of internet television. This is happening now, as the rest of the world is still trying to figure out what IPTV means.

AS JAPAN WAS reconstructing itself after the world war and building up to becoming the second largest economy in the world, there were three keywords that every “salaryman” was working toward: refrigerator, washing machine, television in the 1950s; and color TV, car, air conditioner in the 1960s. These products symbolized the modern world in post-war Japanese society, and television sets were one of the drivers for the growth of the big Japanese electronics firms like Sony, Panasonic, and Toshiba.

With typical Japanese drive, they were soon in the lead. The Japanese national broadcaster NHK demonstrated several world firsts, from high-definition broadcast to holographic television. Now, after pioneering both the video cassette recorder and the CD, Japanese consumer electronics manufacturers have created game plans for taking the lead in high-definition television (HDTV) – from television sets to recording media, in the form of Blue-Ray and HD-DVD.

The Japanese have also taken video over the internet to their hearts, and the Japanese are second only to the Americans when it comes to accessing YouTube. Home-grown Japanese services have taken over the pole position, though, by adding an important twist: They can charge for their services. And

the content is not home videos; it is professionally produced.

Beating YouTube

The usage-time of native Japanese video services is also much higher than YouTube’s. According to NetRatings, while there were accesses from 11.6 million registered users on YouTube from all over the world in May 2007, the leading Niko Niko Doga service had 1.3 million accesses. But users typically spend 2 hours 10 minutes on the site, more than double that of YouTube’s 1 hour 2 minutes. Competitor video-sharing sites Yahoo Doga (run by SoftBank) had accesses from 5.7 million registered users in May 2007, and GyaO had 4.9 million. Users spent 44 minutes on GyaO and 27 minutes on Yahoo.

The reason for the popularity of Niko Niko Doga is its interactivity. Users can comment on the videos while they are playing, and share their comments with other users. This is not true for the mobile version, however, and that service has been growing by the same leaps and bounds as the fixed-line service. From 3 million registered users in September 2007, the fixed-internet service grew to 4 million in November, a curve that continues to rise straight up.

But when registration is free and usage

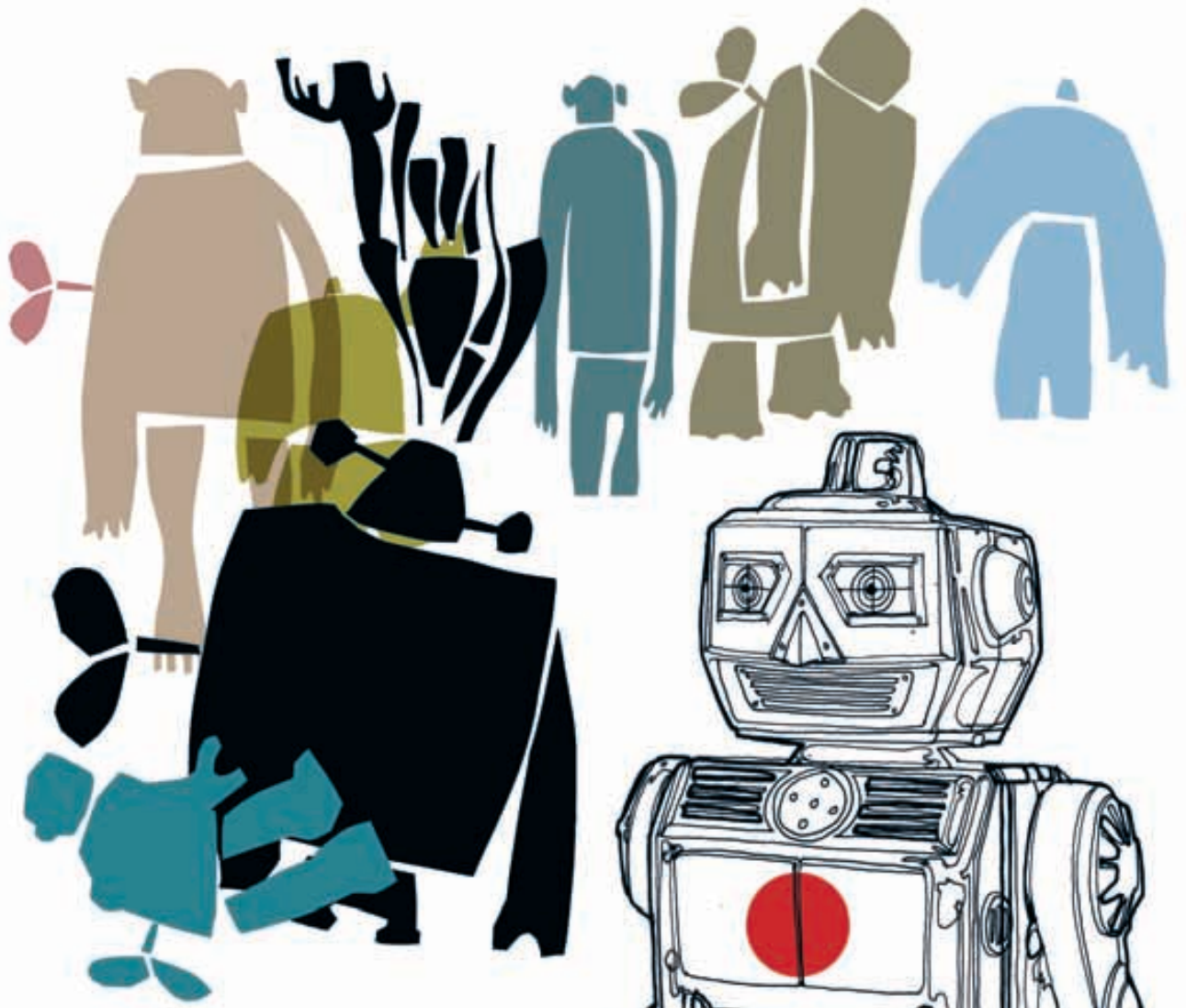
is gratis, how many registered users you have is less important than how you can make money from them. And here, Niko Niko Doga has an advantage. Run by Dwango, a mobile games and contents company, it has 144,000 members who pay a premium of 525 yen (USD 4.8) per month to get quality. Usage is more than double that of YouTube.

Very interactive audiences

The 4 million registered users are not lazy, either. With 3.2 million comments per day, and 59.49 million page views, the 1.43 million unique users watch 15.67 million videos per day. The target is even more ambitious, though: 9 million registered users, and half a million premium members. International expansion is also in the cards for Niko Niko Doga – it has just started in Taiwan, so far with a modest 20,000 members.

The most popular content is Korean soap operas, a genre the Japanese have loved since housewife heartthrob Bae Yong Joon created a stir with *Winter Sonata*, a tear-jerking love story about a couple in trouble and their undying love. So popular are Korean soap operas in Japan that there even are charter tours to the shooting locations for the most famous shows.

But what has potential to change the



Japan is ready to take on any challenge coming from the internet space, in a highly market-driven way and using next-generation networks.

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internet-protocol television (IPTV) world completely is the Japanese leveraging their strong position in consumer electronics. Still the world leader in the development of television sets and video recorders, Japanese manufacturers have been looking hard for ways to keep ahead of their low-cost Chinese and Korean competitors. They may have found it in a unique video-on-demand service, named AcTVila (pronounced “actovila”).

Japan has changed the world before, by listening to what consumers want. And according to a recent study by Ericsson ConsumerLab, the message is loud and clear: Give us TVs in the living room – where we also have the network connections. Already, the flat panel TV is the device users most want connected to the internet.

Long a driver in the Digital Living Network Alliance (DLNA), which aims to make it possible for home devices to connect and share data easily and seamlessly, Sony is a key player in the AcTVila consortium as well, together with marquee names such as Sharp, Panasonic, Toshiba, and Hitachi.

All TVs will have internet

Available in a free and premium version, AcTVila is based on a simplified browser installed in the TV set. When connected to the internet (in addition to – or instead of – the regular antenna), the TV automatically looks up the AcTVila portal, which is also available over the internet. Not all TV models do this – yet. But when they do, the user will be able to choose from a large number of free videos, and become a subscriber, with access to the premium content.

One reason for doing this now is that the Japanese market for TVs is being renewed – the Japanese analog TV network will be shut off in 2011. As in the rest of the world, this is a strong driver for IPTV services. Almost all TV sets will be delivered with an internet-connection in 2008.

In November 2007 there were 100,000 AcTVila users only two months after the

video service started (the basic version launched in February). But the goal is much more ambitious: 70 million AcTVila-capable TV sets in 2011, with 10 percent of all users being paying subscribers, with access to the premium content.

Today, the video content includes Japanese TV series and anime classics such as Gundam or the popular Sazae-san. There are also international standbys such as CSI and recent movies. In the portal part of the service, there are TV listings, news, weather, games, and other content that bears a striking resemblance to the early i-mode portal. In addition, there is shopping – so far, only to view the goods; ordering is done with a mobile phone or PC. And navigation services, which are a hit in the busy Japanese cities that lack street names, are also available for the AcTVila users.

The internet connection in the Japanese television sets has other uses as well. Sony has created a system to show “widgets” – exactly the same as the popular web 2.0 technology used by Google and Facebook – in two models of their TV sets. Connecting to a server on the internet, widgets give users access to information services like Yahoo, weather forecasts, and e-mail.

Video-on-demand from television sets; expanding use of services for user-provided content; these mean lots of

traffic in the network, even though IPTV, in the sense of traditional television distributed over the internet, has yet to take off in Japan despite a penetration of fiber to the home that is second only to Korea.

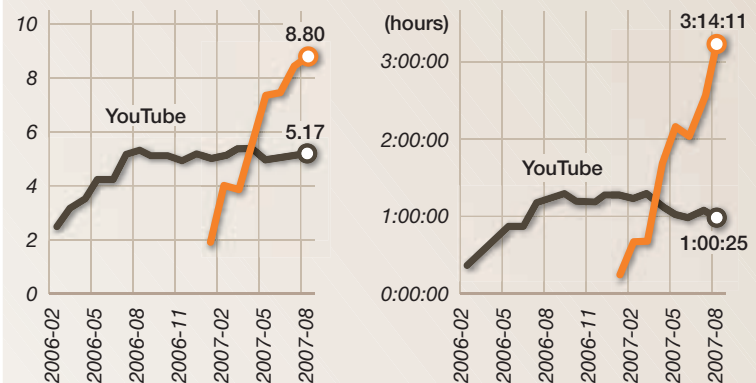
The Japanese broadband connections are the cheapest in the world, and leading operator NTT targets 20 million fiber-to-the-home (FTTH) connections by March 2011. The Japanese government has launched an ambitious plan to turn all the 25 million broadband users in Japan into fiber users by 2010. This puts entirely new requirements on the network.

A secure and open network

With broadband becoming a reality in Japanese homes, users start expecting it to work as well as the telephony network – especially when the two largest suppliers are NTT and KDDI, the second biggest fixed-line operator. For customers, voice-over-internet protocol (VoIP) has long been a reality, and the quality of service (QoS) for the regular number series is dictated by Japanese law.

This has raised a number of problems for NTT, which it decided to address in its next-generation network (NGN) trials by solving all the QoS problems for NGN in one stroke – and creating an open network to boot. Realizing that fiber is only the first step, NTT announced in

Average views and average time per user of Niko-Niko Doga and YouTube



Source: Net Ratings Japan, Inc

February 2006 to August 2007, access by home PC

Yahoo's BB P2P takes on TV

SoftBank owns Yahoo Japan, and its offering of a peer-to-peer-based (P2P) system for television viewing is a challenge in many ways. Notoriously hard to manage from a traffic perspective, yet immensely popular among internet users for sharing multimedia files (copyrighted or otherwise), P2P got a bad reputation as a malicious technology. But when used in a managed way, it can be leveraged to provide services with very little investment for the operator.

That is the intention behind SoftBank's "BBbroadcast," a system that uses a P2P overlay on top of the IP network to enable PC users to view and redistribute content in near-real-time. Using their own SoftBank Hawks baseball franchise as the test vehicle, SoftBank has sent baseball games to more than 120,000 simultaneous users. The number may seem low, but it is exactly the target audience for BBbroadcast. SoftBank intends it to be a service providing "long tail" content, making things available that are not broadcast on national TV, such as SoftBank Hawks games.

The BBbroadcast client does not replace IPTV, but enhances it. Incorporating digital rights management (DRM), it does not create a problem with illegal file sharing. The overlay P2P system overcomes some of the issues with the uncontrolled nature of P2P. Still, it is an unproven technology, not yet established as a popular feature among Japanese users.

Mobile TV in Japan

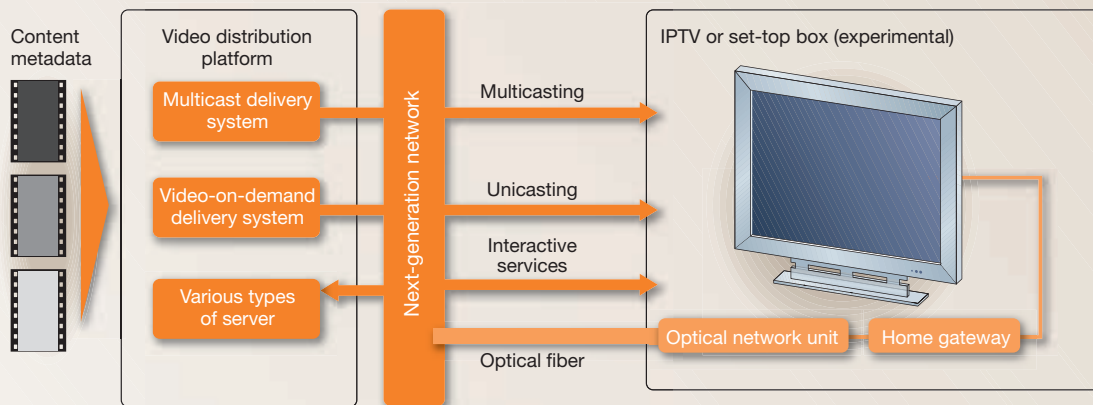
In Japan, mobile television is everywhere. Most new mobile phones have television receivers (popular models include Sharp's Aquos, and Sony Ericsson's Bravia models—spinning on the popular TV brands). Television receivers are even appearing in other devices, electronic dictionaries being one example.

Mobile TV in Japan, however, is still the same as the terrestrial TV, using the same technologies. Analog television broadcasts will be switched off in 2011, and in preparation for this, digital broadcast has already begun. As part of this offering, broadcasters send out their programs on the regular analog network—but also in a lower-resolution format in one segment of the digital multiplex. Originally intended for use in electronic program guides and similar, this low-resolution format still provides crystal-clear TV-pictures on the small screen of the mobile handset.

As yet, broadcasters are the main beneficiaries from this trend, together with end-users, who get a new source of entertainment during their famously endless commutes.

Operators are so far reduced to the role of selling the handsets, which can have its benefits—the Aquos mobile with TV being an early hit for SoftBank. Regulatory changes may affect things, but, paradoxically, mobile TV is likely to be nothing more than a niche application for operators in Japan—even though it is ubiquitous.

Connections to set up internet service providers



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2004 that it would build an NGN with IP everywhere. Field trials started in December 2006.

Based on the ITU Telecommunication Standardization Sector (ITU-T) standards being worked out in the Telecoms and Internet converged Services and Protocols for Advanced Networks (TISPAN), the NTT NGN features high security and reliability. By virtue of being standardized, it is also intended to be open, and interfaces have been released to other players. Interoperability is being shown in the NTT showrooms in Osaka and Tokyo (fully booked several months in advance), though large-scale trials have yet to take place.

The most important feature of the NGN being created in Japan is the quality of service. Using IP Multimedia Subsystem (IMS) to control the traffic, NTT is assuming that four types of communication will dominate in fiber networks of the future:

- Two-way communication, such as VoIP
- Unicast communication, such as video-on-demand
- Multicast communication, such as IPTV with HDTV resolution
- Connections to set up internet service providers

In the showrooms, users can enjoy HDTV video conferencing and video telephony, as well as demonstrations of telepathology and e-healthcare, which show how the Japanese government's stress on tech-

nology is being applied to solve the escalating health problems of its aging population.

Another world first

For video-on-demand with high quality (movies instead of YouTube clips), QoS management makes it possible to download videos at the same time as using the internet, without problems such as pixelated artifacts showing up in the transmission of the stream.

In an NGN, users can get all the advantages of IMS-based IPTV services, such as those under standardization in the Open IPTV Forum. This includes viewing missed broadcasts, trick play (back, forward, etc) and interactive services.

But the technically most complicated area is the encoding and decoding of the video signal. Using a telecom-grade codec, it is possible to shrink HDTV to less than 10 Mbps. This makes sure the network is not overloaded, since even in a fiber optic network the capacity is not infinite.

However, fiber can be used to support the digital TV services being deployed in Japan. The Ministry of Public Management, Home Affairs, Post and Telecommunications has used the NTT NGN to validate retransmission of programs broadcast over the digital network using IP multicast. The intent is to cover those areas of the country where the digital broadcast network may not be available from the start, or conditions are unfav-

orable for other reasons. This has required tweaking the coding of the television signal, as well as solving the signaling of the service information – both of which NTT has done as part of the support work for the ministry. It is not likely, however, that traditional television will be rebroadcast over the NGN from the start of commercial service.

The infrastructure of the NGN conforms to the international standardization, using IPv4 as well as IPv6, IMS in the core network for control of services, and a number of different suppliers of equipment (including television manufacturers) connecting their products into the network. NTT has also realized that the equipment required will be of a totally different magnitude than today's equipment. Terabit routers will be the norm, and NTT is working on studies to create a "carrier-grade" server platform with Japanese manufacturers.

Field trials have been in full swing since April 2007. In the first phase, showrooms were set up in four locations to explain and demonstrate NGN technology to visitors. In the second phase, NTT Group employees tested the NGN services in Tokyo and Osaka. In the third phase, ordinary customers tried out the NGN in the test areas. Commercial deployment will happen in the near future, giving the Japanese another world first: commercial NGN services to ordinary customers. ■

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