IPTV Standard & Network Service for Digital TV in Japan

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Summary

With analog telecasting set to be switched over to digital service in a few years, the TV receiver that was originally born as a display device just for broadcast signals is now diversifying its role to involve new functions, including the display of many types of personal digital content such as videos shot by camcorders, images by DSCs (digital still cameras) and a variety of other content created by end users. TV is going to be a new window for plenty of content available on and through the Internet. TV is getting to have Internet communications capability, becoming the so-called Net-TV (network-friendly TV). Numerous standardization activities for Net-TV have been under way in preparation for new services that permit viewers to enjoy much richer TV experiences and that can bring much more information than in the analog TV era.

Network Service & Its Environment

Since TV was born more than 50 years ago, the TV set has been in the center of a living room in our home and its content has been mainly broadcast TV programs. Although this style will not change quickly, digital technologies enable consumers to easily make high-quality digital content by shooting videos with camcorders and taking photos with DSCs, then displaying them on TV more precisely as well as enjoying broadcast content. For this change of lifestyle, many movies and other products commercially available on devices such as DVDs and Blu-ray discs are changing from analog to digital formats so that customers can enjoy them without losing video and audio quality.

In 2000, terrestrial digital TV broadcasting started in Japan. DTVs (digital TVs) in Japan were designed to receive not only digital audio/video broadcasting, but also digital data services available

through broadcast signals; if a TV is connected to telephone lines, customers can enjoy additional data service that is linked via the Internet to broadcast programs. Although the new generation of TVs in the digital era has such Internet capability, it is only for accessing limited services that are related originally to broadcast programs. It does not fully satisfy PC users because it is a limited world, unlike the free Internet community in which they are well versed to enjoy a variety of services. So there is a natural request for the capability of freely accessing the Internet from DTVs as well.

Japan's network service for digital data started in 1988, originally based on the ISDN (Integrated Services Digital Network), offered at the speed of 64 Kbps, 128 Kbps and 1,500 Kbps. It penetrated into the market with services for BBS (Bulletin Board System), simple web browsing, e-mailing and so on. This was also limited from the standpoint of TV customers because, with this slow network speed, it was difficult to capture huge websites and download large-size content such as movies and TV-like services other than text or images. For the TV in the digital era, it is necessary to handle audio/video information through networks. So the network environment should have enough speed to cope with such huge information traffic.

High-speed Network for Rich User Experience

At the same time as the start of digital telecasting in 2000, a key project to improve the environment for networked information started. The "e-Japan" project was succeeded by a "u-Japan" project later as a more integrated information service model in Japan.

The "e-Japan" project had a key message: "Bring high-speed network service throughout all Japanese homes." Given the message, many network service providers accelerated efforts to offer

broadband network services, starting with ADSL (Asymmetric Digital Subscriber Line) with a speed of a few Mbps. This enabled customers to enjoy a new taste of Internet services that made available not only high-speed text transmission but also audio/video services with small windows. Once ADSL was introduced, competition intensified among key operators and they stepped up promotional campaigns for their Internet services, prompting major operators to expand high-speed networks with a speed of more than 10Mbps such as VDSL (Very high-bit rate Digital Subscriber Line).

Another major change was the telecommunications "big bang" that made possible the FTTH (Fiber To The Home) service such as the so-called "B-Flet's" service. Once the speed merit of VDSL and FTTH was well accepted by PC users, old network services were all replaced by Internet services; ISDN and ADSL started to be replaced by FTTH because it has much greater possibility of service in the digital era. It is another major motive for TV to have a network service business in Japan.

A wide range of customers have already started changing their network environment to one using broadband services at home and such services penetrated more than 60% of households in Japan as of 2007. The broadband services by telephone companies and cable TV operators are continuously expanding *(Chart 1)*.

Joint Net-TV Study Group

There is a product called an STB (Set-Top Box) that can connect TV to a network to provide Internet services. But it has some difficulties to set up and connect to networks because it is not integrated into the TV set itself and it is hard to set up and connect seamlessly using a single TV remote.

If a network-connecting function is installed on a standard TV, there will be a good opportunity to enjoy not only

Chart 1 Broadband connection spreading at households in Japan
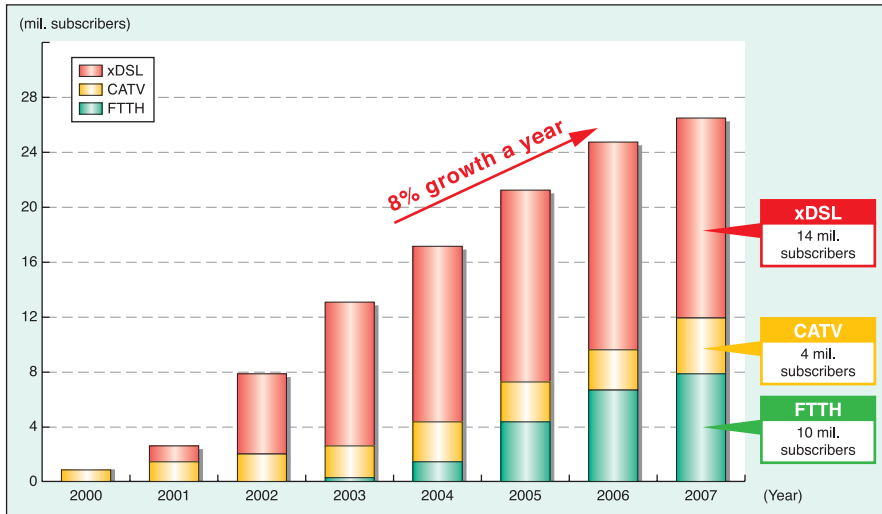
Source : *Ministry of Internal Affairs & Communications*

Internet services linked to TV programs but also many content services and personal entertainment such as the sharing of web photos/movies.

In response to those changes in the broadband environment and requests from customers, major Japanese consumer electronics (CE) manufactures agreed in April 2003 to jointly set up an open discussion group, DTV-SG (Digital TV Information Study Group). The companies – Hitachi, Panasonic, Sharp, Sony and Toshiba – sought to define the specifications of a TV interface for Internet connection and IPTV (Internet Protocol TV) services especially fitting living-room TVs – those equipped with a simple interface permitting the use of a conventional TV remote. The goal of DTV-SG is to define common standards for a standard digital TV having networking features such as Internet browsing, data downloading and search for many kinds of content, making the digital TV a "network-friendly TV" in the digital era.

This group has been expanding by including not only other TV manufacturers but also content suppliers, system providers, network operators and broadcasters. DTV-SG comprises more than 120 companies now and has published reports such as those on Internet browser specifications and on network requirements to pursue many services of content providers, viewed as the next digital fundamentals of Net-TVs.

Network Portal Service for Net-TV

Another important activity in 2006 was the creation of DTP-WG (Digital TV Portal Working Group) designed to find ways of ensuring a safe and secure environment for TV in the Internet era. TV is at the center of the living room and all family members must be able to enjoy it without worrying about unwanted or violent content. It should be well considered to deliver content to Net-TVs in a safe and secure manner when hooked up on the Internet.

For that reason, DTP-WG proposed a certification system between TVs and network portals, and a copyright protection system based on "Marlin technology" for standard Net-TVs in the Internet era. When a TV is switched to the Internet communication mode, a common authorization system will be activated, putting the TV into a safe world regardless of TV brands. This is different from the PC world that should be controlled by customers themselves at their own risk.

Targeting Unified Specifications for IPTV

Later, major network service providers and TV broadcasters also sought to establish unified specifications of TVs capable of Internet hook-up without STBs or special modifications of TVs. Their aim was to make available standard and next basic services with TVs

without any adapter or extra cost of modifications and it is thought the best way from the viewpoint of customers.

As a result, an "IPTV forum" was created in 2006 to establish unified IPTV standards in Japan. DTV-SG, DTP-WG and the IPTV forum have been jointly working for finalizing the unified specifications. IPTV standards in Japan are expected to be finalized by the fall of 2008, permitting content providers, network operators and TV manufacturers to provide many rich services to customers at home with Net-TVs.

"acTVila": Network Service Portal for TV

One of network service portals for Net-TV born as a result of the activities of DTV-SG and DTP-WG is the "acTVila" network service.

"acTVila" was established in July 2006 by major CE manufactures and So-net Entertainment Corp. for offering a "friendly," "safe" and "secure" portal service for Net-TVs and provide many network services to such TVs. It started service for Net-TVs from February 2007.

Information service by acTVila *(Chart 2)*
Web services:
Currently acTVila is offering web information services for daily life and others.

– Information with many images and videos (currently free of charge)
* Weather forecasts for local cities
* Stock price information
* Town/city information
* Beauty and health
* Delivery
* Photo sharing
* Shopping
* Banking
* SNS, etc.

– VOD (Video on Demand) service
* Launched from the end of 2007 (free of charge or pay per play)
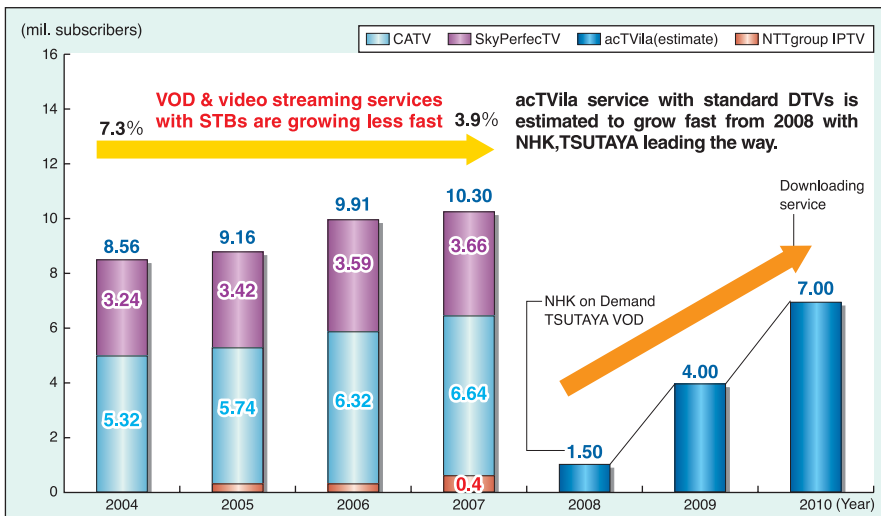 Movies, short clips, information videos

– Download service
* Specifications of the service in the final stage of development; acTVila to start the service by the end of this year
* Catch-up TV service, movie download service

Chart 2 acTVila service

<information service by acTVila>

<VOD service by acTVila>

Source : *acTVila*

Chart 3 IPTV market in Japan

(mil. subscribers)

CATV   SkyPerfecTV   acTVila(estimate)   NTTgroup IPTV

VOD & video streaming services with STBs are growing less fast 7.3% 3.9%

acTVila service with standard DTVs is estimated to grow fast from 2008 with NHK,TSUTAYA leading the way.

Downloading service

NHK on Demand
TSUTAYA VOD

Source : *Sony*

and recorded media, i.e. Beta/VHS videocassettes, laser discs, DVDs and Blu-ray discs. They are completely separated media from each other and customers cannot find related content easily as a seamless service; that is, for example, customers cannot find related movies starring identical actors/actresses or content that is in the same series or category.

If Net-TVs and networked CE products such as networked PVRs (personal video recorders) once get connected with one another, they will have the capability of finding related content through networks by the use of "key" information, so-called metadata.

Metadata is "data of data" and it describes relations among a variety of data, i.e. name, program title, date of creation, author of created content, actor, actress and so on. Networked services should support metadata for this reason and it is an important key for finding related content and linking content. So to say, metadata is a navigation map of content on the Internet.

In addition to navigation, a digital content guide, in particular, and customers' history of use once reflected in their behavior make it much easier to recommend content in a friendly manner through networking services as well.

Conclusion & Future

Once conventional TVs are switched over to Net-TVs, TV can bring a broad range of content from the Internet to our living room. Net-TVs and the networking system will become a digital highway for home because of the speed, offering a great opportunity for new business through Net-TVs and the Internet. With the home network supported by PLC (power line communication), wireless technology and others, Net-TVs will be a digital hub of home networking because of their high-resolution display capability and also their capability of communication with the Internet world.   **JS**

By spring 2008, almost all major TV manufacturers in Japan had installed the IPTV function on their TVs. IPTVs are expected to number more than 70 million by 2010 (Chart 3).

Metadata a Key for Net-TV Service

Given many content services and their providers, another issue to be considered in the digital networking service is to allow customers to search easily, find, and manage content as well as download content easily from the Internet to TVs. Content will be lined up by individual service providers or companies from their own perspectives. It will not be aligned from the viewpoint of customers, but vertically aligned by service providers. It will spread horizontally over many different content providers, making content-to-content relationships fragmented from many different aspects. For end users, it will be much more difficult to search for content without "key" technology in the digital sphere than in the old analog era.

Before the onset of the networking era, entertainment content for TV was mainly programs from broadcast stations