

Predicting TV in the year 2013

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ABSTRACT

TV technology is rapidly advancing. This paper focuses on describing the current trends of television industry, and predicting the situation until 2013. Now it seems that the fusion among TV, Internet and personal mobile device is unstoppable depending on the current trends. As interactive TV, HDTV, 3DTV and all of these television devices which could enhance consumer experience and interactive activities have gradually become the mainstream.

Keywords

Ambient media, integration, smart device, interactive activity

1. INTRODUCTION

Since the late 1920s, commercial television has nearly developed for one century. After the prosperity of half a century, television industry has become the pillar of the media industry. TV has become essential electronic device in the normal daily lives, which has greatly affected the people's work situation and life style. However, the emergence of personal computer is challenging the status of television in the media industry, as the TV has made the same thing to the radio broadcasting. With the fast development of Internet, broadcasting network, and mobile Internet, the current TV has new trends showing some characteristics of ambient media.

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1.1 HISTORY DEVELOPMENT

The evolution of TV industry is closely related to the technology development and social environment development [1]. After the II World War, in the 1950s, because of the advent of peace, people focused more on producing and developing. They created a large number of TV programs for public consumption. Until the 1980s, the emergence of color television and the popularity of the MTV made the image consumption rising to the theme of media consumption. In the 21st century, people's participations in the media are greatly increasing. They hope to emphasize contact and community relations. The sudden appearance of personal computer with Internet connected has been largely satisfied these human requirements. The whole world is becoming to one global village, while more young people join in the PC audiences but not TV. The development of TV industry seems to encounter a bottleneck. But now, people want the further improvement for TV. Personalized, smart, interactive, SNS applications as well as basic TV functions, all of these demands lead to that ambient features with converging service become the mainstream rather than single services in television development.

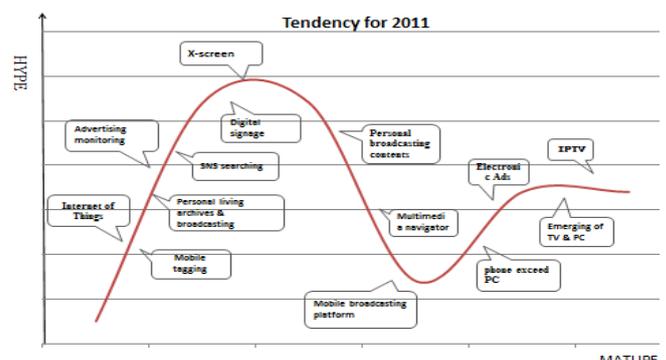


Figure 1. Ambient Media Tendency for 2011

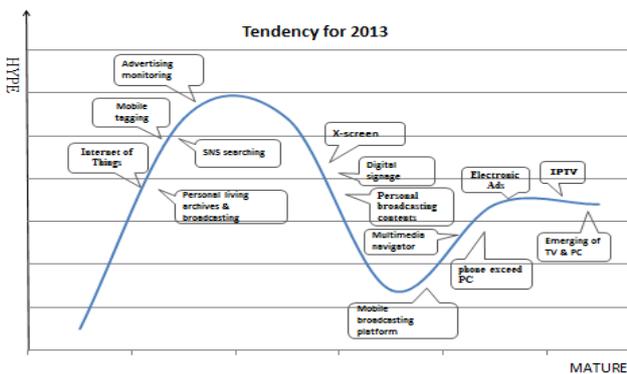


Figure 2. Ambient Media Tendency for 2013

The above two figures are comparison diagrams showing the progressive relationship of ambient media technologies between 2011 and 2013. Vertical axis shows the technology types, and horizontal axis gives the technology mature. The overall trend of the curve paints the specific technology trend in the rising and falling stage. Some of these technologies belong to the broadcasting fields and others do not, but all of them are derivative technologies from ambient media.

In 2011, figure 4 shows that Internet of things, mobile thing technique, personal living archives and broadcasting, advertising monitoring, SNS searching and Digital signage, all of these technologies and services are increasing stage. Mobile broadcasting platform and multimedia navigator have passed their tops; while electronic advertising, phones exceeding PCs and emerging of television and PC are gradually going into their maturity stage.

Figure 5 shows the similar condition until 2013. It is the further development of conditions at present. The obvious changes are that Internet of things, mobile tagging technique, SNS searching will highly speed up. The advertising monitoring even will be the mainstream method. X screen and digital signage will be popular. Multimedia broadcasting platform looks like a little recovery after declines. As the same, emerging of television and PCs, electronic advertising are still in their maturity stage.

1.2 Ambient media features

As the birth of ambient media based on the surrounding environments, this new industry is continuing to encroaching on traditional media industries and never stops. Television industry is not an exception. Ambient media as a part of new electronic media, is beginning to occupy all aspects of the site originally belonged to traditional media. TV industry shows new features in ambient environment.

2. CURRENT TRENDS

2.1 Internet

The traditional coaxial cable couldn't afford the requirement of video quality. IPTV, HDTV and other digital TV program need broadband as the carrier to transfer high quality digital signal. On the other hand, people are spending more time on multimedia devices but not the household TV industries. People aged 15-35 spend most of their time on mobile phones,

computers and other mobile devices for study, work and entertainment, comparing with less time on television, traditional newspapers and magazines [2]. This is a changing for life style, and this continuous tendency will continue over time. Users could choose TV program as their like.

Optic connection

For household TV, they will have more computer features using optic fiber as the main transmitting line. When the programs are transmitted in HD or 3D model, they require lots of bandwidth. Until now, only optic fiber could afford this high capacity to transfer several thousands of HD signals at the same time. On the other hand, broadcasting or multicasting is probably robust and efficient way to do this, in the case of live sport event or popular show.

Wireless connection

For mobile and vehicle TVs, wireless connection would be the only choice for TV. The mobile TV enables consumer to watch program at work place by portable device. Besides that, multimedia navigator with screen connected by satellite or cell networks could also receive TV program wherever driver is. Contents of video and audio could be downloaded from Internet, including road guiding and video clip [3]. Unlike the robust of optic transmission, the advantage of wireless transmission is mobility, which pushes ambient TV to come true by remote control.

2.2 Smart services

Under the help of IPv6 addresses, Internet of things will be built up. Television, as the one of the main household appliances, will be produced and improved with higher intelligence. This intelligence allows TV to be monitored whenever and wherever over the Internet. People could monitor and control TV outside home or even global detection in theoretically. However, the transition from traditional TV to ambient TV will last a long time.

2.3 Interactive

Consumer to device

Interactive television provides a communicating method to enrich viewing experience. By the way of adding additional features in the traditional television program, audiences could complete some communications with television, like playing tennis game with television by gesture controlling interactivity, automatic memorizing the favorite of audience's choice and even filtering the uncomfortable contents for audiences (children).

Consumer to business

Broadcasters and advertisers could almost do everything possible to get consumers' real reaction after watching programs. How to design interactive activities to receive consumer's feedback is a key point for both consumer and company. Audiences could directly involve in the program through phones, remote controller and other sensors for enriching viewing experiences while watching. There are typical uses including selecting video to watch from the video library, participating in online game, online poll and television real-time feedback, home banking, home shopping and so on.

3. DETAIL AND EVALUATION

Based on the previous prediction, connecting with Internet, smart intelligence and more interactive actions are three major trends of television by 2013. Except for these, there are some predictions for the detail of working style of television industry which are divided into four parts: technology, production, content and service.

3.1 Technology

IPv6 address: IPv6 addresses, since reserving IPv4 addresses have been distributed by Internet Corporation for Assigned Names and Numbers (ICANN) On February 3rd, 2011, is becoming the major hope to replace IPv4. These IPv6 addresses could be allocated to mass refrigerators, TVs, telephones and other electronic devices to sharp a real Internet of things. Theoretically, IPv6 addresses could reach 2 to the power of 128, which could be allocated more than 1,000 addresses on per square meters for the whole earth [4]. Except for smart television, every electric and electronic appliance could be assigned to an IP address and controlled by remote network interconnection. The Internet of Things which is still in human imagination could be gradually realized.

Mobile TV: Mobile broadcasting network is further developing. These current smart phones have powerful functions already to watch television programs. Therefore, the rest things are focusing on building up better network and faster transmitting technology. On the mobile TV formats, DVB-H and its evolution DVB-NGH could be good choice. Depending on the prediction report of Pyramid Research, the mobile phone users will continually increase from 2011 to 2015, especially for smart phones. The percentage of smartphones sold to end users is expected to rise from 27% of the cell phone market in 2011 (1.46 billion devices) twice that at 53% in 2015 [5]. More smart phones users will lead to more time spend in smart phones. The consumers' time spent on household TV and computers will also decrease. This trend mainly represents people changing of online lifestyle, and great opportunity for mobile TV development.

IPTV: IPTV (Internet Protocol Television) is a system using broadband network to delivery of digital television services to subscribers. IPTV providers often provide IP phones, broadcasting and Internet access over broadband because of using the Internet. According to the report by Pyramid Research, IPTV subscriptions will reach 131.6 million globally by year-end 2015. Depending on the driven for emerging markets and the extension of coverage in developed markets, the compound annual growth rate will be up to 23% [6]. IPTV would totally replace the traditional TV in the future.

Ambient screens: comparing with traditional screens, ambient screen has incomparable advantages. For example, ambient screen has ambient light rejection, which rejects ambient light. Any lights hitting screen from an oblique angle, such as that coming from above or off to one side, is not reflected back to the audience. And ambient screen has higher contrast. When ambient light hits a conventional screen, it washes out black levels and reduces contrast by significant amounts. But the light for ambient screen control is good and improves higher contrast. The third advantage of ambient screen is HD surface. It has a very smooth surface that allows for the reflection of minute detail found in a high definition video image. Screens with a more noticeable surface texture can make an image appear less sharp and detailed. Audience won't have to sacrifice picture detail to get ambient light performance with ambient screen [7].

3.2 Production

X-screen: x-screen concept gives the consumer a higher sense of control of his own media consumption. X-screen could be efficiently applied that each device is aware about consumer engagement, behaviour, attention, and activity. The X-screen just like a regular projection screen, but it substantially boosts contrast, color saturation, and black levels in ambient light. X screen has the ability to defeat cross lighting from ambient sources. X-screen reflects ambient light from windows and lamps away from the screen and greatly enhances the projected image. Watch movies in a cinema setting, play video games on a larger-than-life scale and experience TV and sports like you've never imagined with front projection in consumers' ambient light environment [8].

3DTV: In the past few years, digital 3D technology is still developing, and finally it can be applied. There are many forms for achieving 3D stereoscopic effect. Three dimensional effects is very powerful advantage for TV display. 3DTV and TV programs will be raised according to the use of image enhancement, virtual reality and human-computer interaction; the mainstream newspapers and magazines would cooperate with the telecom operators and mobile device manufacturers. In terms of products, Sony, Samsung and other electronics companies have been developing 3D household projection equipment. In the future, 3DTV will appears, which will greatly stimulate the 3D consumer market. Removing 3D glasses, the audience could directly watch 3D imaging products with the naked eye and enjoy stereo effect in the near future [9].

System Controlling: One example of consumer contributed and moderated media is A3TV that is Anytime, Anywhere and by Anyone TV introduced by Oliveira [10]. The system is designed to broadcast TV over the Internet with content produced, defined and consumed by Internet communities.

3.3 Content

Consumers as creators: Consumers as to be the creator and contributor of TV content. When Internet takes part in the world of television, the contents also step into the TV screen. Especially, most of these contents are produced by private persons themselves. Everyone could be the media creator and broadcaster, while openness will be more and more common.

Self-controlling: consumer automatically moderate content and choose what they want to watch by themselves, which is online content control and aggregation. This is happening and growing its popularity all the time when the technology is getting better and consumers are learning how to use it. Before watching the broadcasting material and advertising, those consumers have actively chosen what they are interested in, which has provided the preliminary selection for advertisers already.

Content filtering and automatic distribution: broadcasting company also has to provide automatic filtering and distribution service for content, although consumers could control what they like and dislike. Most of personal broadcasting to multi strangers does not specifically point to some certain people group, but point to all the possible receivers without any differences, which is a kind of harassment as well as novelties for the ordinary people who do not accept the intention. People need firewalls and filtering services to block these aimless random broadcasting. Companies as content provider should be very professional for automated distribution of broadcast program, advertising, and

announcements across various channels, as their Internet associates have done, Google and Bing. If broadcasters and advertisers provide automated distribution services, these services will help them more accurately select the potential buyers. Providing best services for consumers and finding the most suitable buyers for companies, it looks like a perfect model without disadvantages.

Advertising skipping: the self-controlling leads to another question. How about advertisement? That is the most major incoming for commercial broadcasters but consumers dislike to watch advertising in most situations. Ads skipping will lead them to lose mass advertising clients. However, for consumers they definitely dislike the contents having no relation and interest with them. Only when they watch some necessary production ads, this offensive feeling will be a little released. There are will be compromise between consumers and companies. The company only support advertising skipping service for subscribers and prevent any other advertising skipping attempts. Actually, some companies have developed similar patent application to prevent users from changing channels to avoid watching television commercials as well as prevent viewers from fast-forwarding through recorded advertisements.

3.4 Service

EPG service: EPG (electronic program guide) services could be extended by ambient technology. It could be made context and time aware. For example the TV screen in the children's room could have special emphasis on showing all the kids programs from the guide. In the living room the EPG could be showing specially the family programs during day and then different content depending on parent's preferences in the evening. Lehtinen Juha-Matti has introduced a method for combining context-awareness with DVB-H [11]. The idea is that user's context and location would affect the way programs are displayed in the guide. For example when consumers' location information are outdoors, the emphasis is on "short" content which is easy to jump in and doesn't require long concentration.

Multi-channel distribution: Since TV service looks like ubiquitous, the information distribution by multi channels also becomes available. Including mobile TV, outdoor TV, household TV, hotel TV and vehicle TV, all of these TV sets **Higher interactive experience:** both EPG and audience measuring will be further designed to provide better interactive experience as well as feedbacks by new electronic sensors and higher efficiency method. 3DTV, ambient screen and sound will further improve to step into household room.

Multi-content provider: except for the professional broadcasting companies, the private outdoor group as well as personal consumer could be the provider under the situation of network fusion. Consumers may add eyewitness material from newsworthy events, when news happens. Personal and living archives will allow consumers are able to produce their personal media contents. Connecting with Internet will provide possibility to spread these contents [14]. There are following by content filtering and anti-advertising skipping.

SNS with TV: SNS websites seems that they will broaden their operating ranges. Some biggest SNS have tried to provide TV service, as Facebook TV and Twitter TV. Because of numerous subscribers or users, this SNS TV will be popular among some group of persons liking watching TV when chatting with friends. People enjoy gathering around it to watch something of mutual interest. Discuss and debate about

could be used to spread public news and emergency information unconditionally and preferentially. Take emergency alarming of earthquake in Japan for example, UrEDAS, Urgent Earthquake Detection and Alarm System, can realize the real-time early earthquake detection and alarm system in the world [12]. This system, which announced beforehand about 10 seconds, has provided great help and saved tens of thousands of lives during Tsunami earthquake on March 11th, 2011 [13].

Audience measuring and feedback: broadcasters want to evaluate the affection of TV programs and advertisement from passive measurements to active measurements (e.g. via smart sensor inputs) to create a media experience, so they design interactive activities to receive audiences' feedbacks. Sending SMS to advertiser has been out of date. Audience measurement, engagement measurement, and attention measurement have new features under ambient technology condition. After having get the permission from audiences, broadcaster could use cameras, gesture controller in display and attention sensors to monitor consumer's attention. These technologies have already been implemented in vending machines in Japan. It is possibly to estimate age and sex with reasonable accuracy and these are the demographic variables with the strongest predictive power related to media use and content preferences. But the major question is how to persuade consumers to accept these monitoring sensors. The market researching companies of measuring is very likely to pay back or compensate for these large scale feedbacks.

4. FUTURE

The future development of TV industry is the successor of current mainstreams.

Integration of all kinds of networks: Internet, Internet of Things, and broadcasting network, (including mobile broadcasting) the integration for all of these networks allows every consumer to watch TV program or even video clip anytime and anywhere by a universal terminal (such as mobile phone). Consumer will enjoy the convenience from this integration. Subscribers could even download these video data through the universal network. By WiFi, or other near-field communication technology, consumers give commands to control those smart televisions.

what they are viewing and explaining others how they understood it and so on. With people who has also seen the same show or maybe have missed it and wants to hear about it. In this perspective it seems more than natural that TV would become a part of the social media that further impact on the existing pattern of television industry to some extent.

5. CONCLUSION & ACKNOWLEDGEMENTS

This paper has viewed the present condition of TV field. To show the outline, it is not only for main trends but also for technology details in the 2013. It also predicts the prospect in the future, but the real life is still unknown until the world is coming. We would like to sincerely express highest appreciation and gratitude to all our research colleagues at NELME project group, especially these great teammates at VTT and YLE.

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