**텍스트, 클립아트이(가) 표시된 사진

자동 생성된 설명**

**APT REPORT ON**

**INTERACTIVE MULTIMEDIA SERVICES ON IPTV/CATV IN THE ASIA-PACIFIC REGION**

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1. **Scope**

The ITU Asia-Pacific Regional Initiative (2011-2014) on Digital Broadcasting focused on the field of interactive multimedia services to broadcasters in the Asia-Pacific region. It did not identify the problems to introduce IP based interactive TV services and to deploy it. EG MA in ASTAP planned to survey the current status of broadcast, CATV, and IPTV by telecom operators, their interests on interactive multimedia services on IPTV/CATV, and their expectations to standardization organization to solve their problems. This report describes the results of the questionnaire and the standardization targets on this matter in Asia-Pacific region.

1. **References**

[ITU-D Survey] REGIONAL INITIATIVES – ASIA-PACIFIC in ITU-D, “Interactive multimedia services in Asia-Pacific: Trends and insights” (2015).

[ITU-T H.780] Recommendation ITU-T H.780 (2012), Digital signage: Service requirements and IPTV based architecture

[ITU-T Y.1901] Recommendation ITU-T Y.1901 (2009), Requirements for the support of IPTV services

[ITU-T Y.1910] Recommendation ITU-T Y.1910 (2008), IPTV functional architecture

1. **Terms and Definitions**
   1. **Terms defined elsewhere**
      1. **IPTV** [ITU-T Y.1901]: Multimedia services such as television/video/audio/text/graphics/data delivered over IP-based networks managed to support the required level of QoS/QoE, security, interactivity and reliability.
      2. Digital signage [ITU-T H.780]: A system that sends information, advertising and other messages to electronic devices (e.g., displays, speakers) in accordance with the time of day and the location of the display, or the actions of audience. Contents and their relevant information, such as display schedules, are delivered over networks.
   2. **Terms defined in this Report**

*‘None.*

1. **Abbreviations and Acronyms**

CATV: Cable Television

IPTV: Internet protocol television

FTA: Free to Air

DTH: Direct to home

PHL: Philippines

CHN: China

MNG: Mongolia

JPN: Japan

PLW: Palau

PNG: Pupua Newguinea

THA: Thailand

CITA: Communications and Information Technology Authority in Mongolia.

VNM: Viet Nam

1. **Interactive multimedia services on IPTV/CATV**

In the converged industries of telecommunications and broadcasting, interactive multimedia services are not new. Even in the pre-convergence era, both industries developed and delivered these services. In Europe, broadcasters started delivering interactive ‘Teletext’ services as early as the 1970s, and the first attempts by telecom operators to browse the Internet and deliver web content over ‘connected’ televisions were recorded in the 1990s - the latter limited by Internet speeds and applications to access content.

With the widespread availability of broadband Internet and powerful connected devices, the service propositions and traditional roles in the converged value chain have changed dramatically. This availability has made it possible to efficiently distribute and consume data heavy services (i.e. video or television like services) anywhere and anytime. Consumers now have a choice of watching video content over connected, smart television sets, set-top-boxes, tablets or smart phones. They can choose what, when, and where they would like to consume their audio-visual services, combined with services such as voice, text, Internet and social network access.

From the supply side, broadcasters and content providers have access to a wide range of networks and connected devices to deliver their content. Network and service providers can enter into content provisioning (more) easily as delivery networks have become (more) technically independent from the content they carry. This broadband development comes along with the digitization of the entire value chain, from content production to consumption, lowering unit costs and entry barriers. Market players now often have multiple roles, change their roles more easily and enter into multiple alliances for delivering interactive multimedia services.

The ITU Asia-Pacific Regional Initiative (2011-2014) on Digital Broadcasting has the objective of the Provision of assistance in the field of interactive multimedia services to broadcasters in the Asia-Pacific region. Their report contributes to this objective by providing insights into the trends in the field of interactive multimedia services to broadcasters, telecom operators providing broadcast services, and national regulatory authorities (NRAs) [ITU-D Survey]. It covers market, technical and regulatory trends in this field and builds on the work carried out by ITU on digital broadcasting, broadband Internet, and convergence.

However, the report includes the limited country cases such as Austria, Hong Kong (China), India, Japan, Republic of Korea, and Thailand. These countries have been introducing interactive multimedia services. Countries that are considering the introduction and deployment of such services are not included. And the report focuses on digital broadcasting, mobile application and IPTV. The problems to introduce IPTV and to deploy it are not described. EG MA is interested in the interactive multimedia services on IPTV/CATV and the problems to be overcome.

The objectives of the questionnaire are to collect the IPTV deployment situation and goal of countries in Asia-Pacific region. For examples, Figure 1 shows categories of interactive multimedia services (see Appendix 1) [ITU-D Survey].

After collecting the questionnaires and analyzing them, we would like to identify the problems to be overcome, to share the ideas to solve the problems, and to identify the standardization topics in order to spread interactive multimedia services in Asia-Pacific region.

1. **Status of deployment for Interactive multimedia services on IPTV/CATV**
   1. **Broadcasting services**

In several countries, the latest technologies and services are deployed from their capital city or metropolitan cities. Regarding broadcasting services, digital broadcasting by FTA, DTH, IPTV, CATV and mobile TV are used in such areas. Some countries are opening the roadmap to move to digital broadcasting from analog broadcasting completely. Table 1 shows the roadmap to digital broadcasting in the responded countries.

Table 1 – migration timing from analogue broadcasting to digital broadcasting

|  |  |  |
| --- | --- | --- |
| No. | Country | Analog to digital migration |
| 1 | Philippines | 2023 |
| 2 | China | No roadmap (Number of digital CATV subscriber is about 200 million) |
| 3 | Mongolia | 2015 (89 terrestrial broadcasters, 87 TV broadcasters, 63 CATV broadcasting entities) |
| 4 | Japan | 2011 (except the area where was affected by the Great East Japan Earthquake) |
| 5 | Palau | 2006 (Only one digital TV provider in Palau) |
| 6 | Pupua Newguinea | 2018 (Three analog and four digital TV services) |
| 7 | Thailand | 2023 (five years from 2018) |
| 8 | Viet Nam | 2019 (31/12/2019) |

In PHL, Digital terrestrial television broadcasting services will gradually replace the analog terrestrial television broadcasting service. On the other hand, cable television broadcast services subscription is expected to decrease due to the rise of affordable video on demand (VoD) offerings provided by the pay OTT players (e.g. Netflix, HOOQ, Hulu).

In CHN, they are expected to be more interactive and smart to TV services.

In MNG, the State Policy on Development of Information and Communication Technology for year 2017-2025 was approved by the resolution No.47 of the Cabinet of Mongolia in 2017. Within the framework of the policy, radio broadcasting technology will have transferred to digital system.

In JPN, there is no plan to do a new broadcasting service in Japan.

In PLW, IPTV has high startup cost and is being considered as a 4G product rather than riding the CATV infrastructure by Palau National Communications Corporation (PNCC).

In PNG, once television broadcasting is switched to digital, this will pave way for the Radio Broadcast to follow. Also with this transition will create more spectrum for future use.

In Viet Nam, the project on transmission, terrestrial TV broadcasting digitalization have been implemented in phases with different zones of the country and complete the transition to digital terrestrial television before 01/01/2020.

* 1. **(Mobile) broadband services**

As for the broadband Internet services, xDSL, FTTx, HFC(CATV), WiFi, Mobile(3G/LTE) are used. The speed of broadband services are shown in Table 2.

Table 2 – Speed of broadband services.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| No. | Country | Coverage | Speed of broadband services (Mbps) | | | |
| xDSL | FTTx | HFC | Mobile (3G/4G) |
| 1 | Philippines | - | 20 | 150 | 200 | 12.7 |
| 2 | China | 70% | - | 50 | - | - |
| 3 | Mongolia | (\*2) | 2 | - | 5 | - |
| 4 | Japan | 100% | - | - | - | - |
| 5 | Palau | (\*3) | 45 | 100 |  | 63 |
| 6 | Pupua Newguinea | 11% | - | - | - | - |
| 7 | Thailand | - | 30 | 200 | - | 10 |
| 8 | Viet Nam |  | 5 | 100 |  | 21 |

(\*2) Mongolia implemented National Broadband Program between 2011 to 2015. In result of implementation of Program on high speed broadband network the fiber optic cable network has been extended to over 25,000 km connecting 298 villages /soums/ of Mongolia excepting 32. These 32 soums have limited ICT service /only mobile phone/ by the private VSAT network.

(\*3) PNCC offers VDSL (293 subscribers) to business/government customers, residential ADSL (1,076 subscribers), FTTP (2 subscribers), Single-Dwelling (3,240 subscribers), Multi-Dwelling (889 subscribers) services, Wi-Fi Hotspot (157 locations) services, and 2G, 3G & 4G services with prepaid (23,247 subscribers) and postpaid (2,523 subscribers), according to PNCC 2016 Audit Report.

The future roadmap of high speed broadband network is shown in Table 3.

In JPN, there are no data about the speed of each broadband service.

Table 3 – Roadmap of the speed of broadband services.

|  |  |  |
| --- | --- | --- |
| No. | Country | Future roadmap of high speed broadband network |
| 1 | Philippines | With the realization of National Broadband Plan, it expected to have at least 10 Mbps in every household by 2020. This will be complemented with the entry of new major player, in which the winning telco player, to have deliver an average of 27 Mbps in its first year of operation. |
| 2 | China | By 2020, it will cover all rural areas and get through the last mile of the network infrastructure |
| 3 | Mongolia | Future goal is that 100Gbps high speed internet service will provided to subscribers in 2025 |
| 4 | Japan | It is appropriate to continue efforts toward the development of the environment that will enable all people to utilize ICT whenever they wish in existing underdeveloped areas where mobile phones or ultra-high speed broadband services are not available and correct disparities in ICT use opportunities. |
| 5 | Palau | PNCC plans to increase its 3G & 4G coverage, expects to decommission its 2G services in 2019. While data is the main objective, other services to be offered on top of the 4G services. |
| 6 | Pupua Newguinea | Telecom network operators yet to deploy fixed high speed broadband services and also costly for mobile broadband users |
| 7 | Thailand | - |
| 8 | Viet Nam | The broadband development plan aims to at least 40% of households (or individual subscribers) nationwide will have access to and use fixed-line broadband services by 2020. Of these subscribers, at least 60% will be connected with the minimum download speed of 25 Mbps. The plan aims to ensure that all public telecommunications access points nationwide will use fixed-line broadband services, of which at least 50% will have fixed-line broadband access with the minimum download speed of 50 Mbps. With regards to mobile data networks, the broadband development plan seeks to ensure that at least 95% of residential areas will have coverage of 3G/4G services at average downstream speeds of 4Mbps in urban locations and 2Mbps in more rural areas. |

* 1. **Interactive TV services by CATV operators**

### 6.3.1 Deployment IP based interactive TV service by CATV operators

In PHL, the important points to realize IP based interactive TV services in these years are Internet speed, quality of video, number of contents available and cost. They are interested in digital signage, e-learning and disaster alert information dissemination as the future interactive multimedia serves. Closed caption will be used as an accessibility function to the above services. Relationship between OTT services and local services will be determined.

In CHN, the important points to realize IP based interactive TV services in these years are quality of video. They are interested in Video on demand, TV instant messaging, Video games, education, Smart Home, TV shopping etc. Killer application will be all-in-one content search and personalized content recommendation. The IP based interactive TV services has been deployed. Now they are using CDN to reduce the pressure of trunk bandwidth, which may also reduce operating costs. Accessibility functions like voice input specifically improved user experience significantly. The goal of the interactive TV is to revolutionize the traditional TV services and attract more people back to TV screen by more appealing user experience and innovative TV functions. The two services, OTT services and local services, will be gradually integrated in order to provide better service for customers.

In MNG, Currently, four IPTV operators has been playing the market and also there are several OTT services, such as onairtv.mn, looktv.mn. In order to realize IP based services, there are following problems, such as weak regulations and policies and infinitive cost with interactive connection between IPTV operators and TV service or content providers. TV services, such as e-learning, e-health, data services so on, are not well developed. There are no killer services in IPTV services yet. MNG’s goal is to create interactive connection center. So, CITA will plan to formulate feasibility study in the year 2019.

In PLW, PNCC think that offering IP based interactive TV services will be solely dependent on the coverage of 4G services in Palau. OTT services are to be taken into consideration as they have the potential to overtake DTV as the primary source of video entertainment. A sustainable, high-performing platform needs to be implemented to support the growth of either trend.

In PNG, mainly CATV subscribers are from mining employee residence, company residential areas, etc. Public often rely on Free – To – Air. As such for average would be 100% CATV connection to each residential area of Mining and companies. Public would be not have connectivity.

In THA, IP based interactive TV services are thought to solve the problem by increasing speed internet with FTTH technology. However, high cost, quality of video, and resolution are problems to be overcome to realize IP based interactive TV services including games, voting, online shopping, etc.

Table 4 –Status of CATV

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| No. | Country | Number of CATV operators | Subscribers | Interests of IP or OTT | IP technology (DOCSIS / FTTH ) | Plan to IP based TV services |
| 1 | Philippines | 1457 | 2,531, 651 | IP | DOCSIS/HFC. | No plan |
| 2 | China | Dozens | 230,000,000 | Both | DOCSIS, FTTH(PON), HINOC | Already deployed. CDN is expected to reduce costs and so on. |
| 3 | Mongolia | 63 | 833,000 | Both | - | Currently, CITA is formulating a broadcasting network policy. |
| 4 | Japan | 508 | 30,000,000 | - | - | - |
| 5 | Palau | 1 | 4,129 | OTT | FTTH(PON) | No plan |
| 6 | Pupua Newguinea | 20 | - | - | - | No plan |
| 7 | Thailand | 390 | - | Both | DOCSIS and FTTH(PON) |  |
| 8 | Viet Nam | 27 | 11,000,000 | Depends on operator | DOCSIS 3.0 and FTTH (GPON) | Providing IP based interactive TV in big city. |

### 6.3.2 Standardization topics to be expected for future services

* Parameters for the Quality of Service and deployment models should be determined to ensure the success of IP based interactive services deployment (PHL).
* Video Metadata structure for the new IP video streaming services, more features like content data mining, closed caption, video labeling, and interactive advertising should be supported and standardized (CHN).
* Guidelines, solutions should be related with connection center and remote monitoring center (MNG).
* We expect that handbooks will provide difficult, challenge of deployment, maintenance, improvement interactive TV services as well as solutions in order to overcome (VNM).
  1. **Interactive TV services by telecom / broadband / mobile operators**

### 6.4.1 Deployment IP based interactive TV service by telecom operators

In PHL, the important points to realize IP based interactive TV services in these years are Internet speed, quality of video, number of contents available and cost. They are interested in digital signage, e-learning and disaster alert information dissemination as the future interactive multimedia serves. Closed caption will be used as an accessibility function to the above services. Relationship between OTT services and local services will be determined.

In CHN, the important points to realize IP based interactive TV services are Quality of video, number of contents, cost. They plan to optimize system architecture of IP based interactive TV service, create ecological environment for more partners (including content providers, value-added service providers, application providers). They are interested in Video-call, e-learning, e-health, e-government, etc. Good technology and user experience of OTT services will be converged in IP based interactive TV service.

In PLW, OTT services are to be taken into consideration as they have the potential to overtake DTV as the primary source of video entertainment. A sustainable, high-performing platform needs to be implemented to support the growth of either trend. Offering IP based interactive TV services will be solely dependent on the coverage of 4G services in Palau.

In THA, IP based interactive TV services started. The current problem is how to regulate the contents. Accessibility functions are included in requirement, OTT services are more popular than traditional services. The goal of IP based interactive TV services is to control behavior of human.

In Viet Nam, interactive TV services based on IP have been deployed by operators as Viettel, VNPT, FPT, SCTV. The subscriber cost of IPTV services must meet the quality of contents in order to gain more customers, right now the quality of contents is very low and audience behavior still prefer traditional TV over interactive TV programs.

Table 4 –Status of Interactive TV services by telecom operators

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| No. | Country | Number of TV services by telecom operators | Subscribers | Interests of IP or OTT | IP technology (FTTH/others ) | Killer service |
| 1 | Philippines | 436 | 67, 267, 180 | OTT | FTTH (PON). | Nothing |
| 2 | China | 2 | 50,000,000 | IP | FTTH | Nothing |
| 3 | Mongolia | 4 | 192,000 | No | - | Nothing |
| 4 | Japan | - | - | - | - | - |
| 5 | Palau | 0 | 0 | OTT | FTTH (PON) | - |
| 6 | Pupua Newguinea | 1 | 20,000 | - | FTTH | Telecoms operators to ascertain and liaise with content providers |
| 7 | Thailand | 12 |  |  | FTTH (PON) | - |
| 8 | Viet Nam | 4 | 1,800,00 | IPTV | FTTH (GPON) |  |

### 6.4.2 Standardization topics to be expected for future services

This clause collects topics to be standardized for future services

* Parameters for the Quality of Service and deployment models to ensure the success of IP based interactive services deployment. (PHL)
* Solutions for the deployment (CHN)
* More specific solutions for service platform deployment (CHN)
* sustainable evolution for standards (CHN)
* convergence to provide for IP based interactive TV service, cost effectively (PNG).
* Quality of Services (QOS) and pirated content protection techniques (THA)
* Handbooks are expected to provide difficult, challenge of deployment, maintenance, improvement interactive TV services as well as solutions in order to overcome (VNM).
  1. **Policy and regulation concerns to IP based interactive TV services**

This clause describes policy and regulation concerns to start and deploy IP based interactive TV services. In PHL, IP-based interactive TV services fall under the rules that govern value-added services (VAS). In the era of convergence, Institutional convergence is necessary in order to resolve convergence issues. A regulatory issue is how it will be treated especially when an IP based interactive TV service is failed to delivered/transmitted.

In CHN, IP based interactive TV services can be carried out under the license of government. Different providers in the supply chain should conform to the regulation and take their responsibilities.

In MNG, CITA is formulating policies which are a broadcasting network and broadcasting content.

- In 2017, CITA presented a draft of Broadcasting law. Communication regulation commission, CRC, grants separate licenses. However, MNG have been planning converged licensing, it is still on research.

In JPN, IP multicast transmission falls under broadcasting in the Broadcast Act, since the transmission by IP multicast involves simultaneous transmission of identical content to an unspecified number of people and not the transmission of content according to the request by a recipient. Therefore, those who want to perform the services must obtain the registration of the Minister for Internal Affairs and Communications based on the Broadcast Act, and will be expected to follow the rules pertaining to broadcasting programs, in the case of pay TV rules pertaining to pay TV, and rules pertaining to telecommunication equipment, etc. They have no plan about institutional convergence.

In PHL, it is expected to put demarcation on where IP based interactive TV services provider and telecommunications provider is accountable, whenever it fails to deliver the IP based interactive TV services.

In VNM, there is policy on management, provision and utilization of radio and television services. IPTV is one of many television services is being regulated in Viet Nam.

* 1. **This project and questionnaire**

For PHL, it is very helpful for the administrations to assess its future needs. This project will be helpful in developing country’s plans and policies. The questionnaire comprehensively covered the situation, issues and solutions involving Interactive Multimedia Services.

For CHN, it is quite inspirable for CATV, Interactive TV and Telecom operators to rethink their business positioning. they are glad to help this project and interested in the successful experiences from other countries. On the other hand, it’s important to produce more completed international standards which should consider situations and objectives of different countries.

For MNG, the report will show where we are and give a change compare to other same level countries. Also, MNG hope it will support to identify future trend in the field of broadcasters and broadcasting services. MNG hopes the report will be useful for a further policy and regulation of Mongolia.

For THA, this survey will be useful for getting ready to step into IP interactive TV services.

1. **Consideration**

Responded countries in Asia-Pacific regions are interested in interactive IPTV/CATV services. Telecom operators and CATV operators are interested in migration to IP based services. In some countries, however, the quality of services by IP based services are not better than digital broadcasting services due to network bandwidth. It is expected that handbooks will be standardized in order to provide difficult, challenge of deployment, maintenance, improvement interactive TV services as well as solutions in order to overcome. End-users in responded regions become more interested in on-demand video services than broadcasting services. Accessible TV services, such as captioning, sign-language, and audio description, are not included in their road map now.

1. **Conclusion**

There have been many countries migrating into digital terrestrial broadcasting and they are interested in IP-based broadcasting over networks. They are investing on fixed broadband and mobile broadband. As OTT services are rapidly deployed in APT region, technologies to provide good user experience are expected by convergence between IP based interactive TV services and OTT services. Regarding standardization, more specific solutions for service platform deployment, sustainable evolution for standards are expected. Applications of interactive IP-based services such as e-learning, e-health and accessible TV services have not been provided yet.

Since 2020, COVID-19 changed the world. The telecommunication technologies became indispensable in order not to spread the pandemic. Working remotely and staying home increased the time to use interactive IP-based TV services at home. As this report is based on the responses before COVID-19 pandemic, the latest concern may not be reflected in this report. It is important for us to continue further research to search for the new needs to standardization in Asia-Pacific region.

**Appendix: Questionnaire on Interactive multimedia services on IPTV/CATV**

**Section 1: Elementary Part**

1. **Introduction:**

In the converged industries of telecommunications and broadcasting, interactive multimedia services are not new. Even in the pre-convergence era, both industries developed and delivered these services. In Europe, broadcasters started delivering interactive ‘Teletext’ services as early as the 1970s, and the first attempts by telecom operators to browse the Internet and deliver web content over ‘connected’ televisions were recorded in the 1990s - the latter limited by Internet speeds and applications to access content.

With the widespread availability of broadband Internet and powerful connected devices, the service propositions and traditional roles in the converged value chain have changed dramatically. This availability has made it possible to efficiently distribute and consume data heavy services (i.e. video or television like services) anywhere and anytime. Consumers now have a choice of watching video content over connected, smart television sets, set-top-boxes, tablets or smart phones. They can choose what, when, and where they would like to consume their audio-visual services, combined with services such as voice, text, Internet and social network access.

From the supply side, broadcasters and content providers have access to a wide range of networks and connected devices to deliver their content. Network and service providers can enter into content provisioning (more) easily as delivery networks have become (more) technically independent from the content they carry. This broadband development comes along with the digitization of the entire value chain, from content production to consumption, lowering unit costs and entry barriers. Market players now often have multiple roles, change their roles more easily and enter into multiple alliances for delivering interactive multimedia services.

The ITU Asia-Pacific Regional Initiative (2011-2014) on Digital Broadcasting has the objective of the Provision of assistance in the field of interactive multimedia services to broadcasters in the Asia-Pacific region. Their report contributes to this objective by providing insights into the trends in the field of interactive multimedia services to broadcasters, telecom operators providing broadcast services, and national regulatory authorities (NRAs) [ITU-D Survey] . It covers market, technical and regulatory trends in this field and builds on the work carried out by ITU on digital broadcasting, broadband Internet, and convergence.

However, the report includes the limited country cases such as Austria, Hong Kong (China), India, Japan, Republic of Korea, and Thailand. These countries have been introducing interactive multimedia services. Countries that are considering the introduction and deployment of such services are not included. And the report focuses on digital broadcasting, mobile application and IPTV. The problems to introduce IPTV and to deploy it are not described. EG MA is interested in the interactive multimedia services on IPTV/CATV and the problems to be overcome.

1. **Objective of the Questionnaire:**

The objectives of the questionnaire are to collect the IPTV deployment situation and goal of countries in Asia-Pacific region. For examples, Figure 1 shows categories of interactive multimedia services (see Appendix 1)[ITU-D Survey] .

After collecting the questionnaires and analyzing them, we would like to identify the problems to be overcome, to share the ideas to solve the problems, and to identify the standardization topics in order to spread interactive multimedia services in Asia-Pacific region.



1. **Responsible Group:**

WG SA / EG MA

1. **Rapporteur of the Questionnaire:**

Name and contact detail of the person of the WG/EG who will deal with the responses

1. **Meeting at which the Questionnaire was approved:**

EG MA and WG SA in ASTAP-29 and ASTAP-30

1. **Target Responder:**

APT Members/Associate Members/Affiliate Members

1. **Deadline for Responses:**

15 December 2018

**Section 2: Questionnaire Part**

**deployment of interactive multimedia services on IPTV/CATV**

1. **Contact information**

1.1 Primary contact information

|  |  |  |  |
| --- | --- | --- | --- |
| *Date* |  | *Country* |  |
| *Organization* |  | | |
| *Title* |  | *Name* |  |
| *Email* |  | *Telephone* |  |

* 1. Secondary contact information

(Please copy the following table, if there are two or more secondary contact persons)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| *Date* |  | | | |
| *Organization* |  | | | |
| *Title* |  | | *Name* |  |
| *Email* |  | | *Telephone* |  |
| *Answered section Q. No.* | |  | | |
| *Notes* | |  | | |

* 1. Status of this response

Select one: First response / Second response

1. **Questions**

Question 1: Broadcasting services

* 1. In your capital city, how many broadcasting services are available?
  2. In broadcasting services, are digital broadcasting services available?
  3. If you have the roadmap of the migration from analogue TV to digital TV services, when would you terminate analogue broadcasting services?
  4. What is the penetration ratio of TV sets in households?

(1-5) Would you explain your future roadmap of broadcasting service in your country?

Question 2: (Mobile) broadband services

(2-1) In your country, what is the coverage ratio of Internet and broadband?

(2-2) What is the coverage ratio of each access network (xDSL, FTTx, HFC(CATV), WiFi, Mobile(3G/LTE))?

* xDSL
* FTTx (What is x?)
* HFC
* Mobile

(2-3) How fast is the speed of current access network services?

* xDSL
* FTTx (What is x?)
* HFC
* Mobile

(2-4) Would you explain your future roadmap of high speed broadband network?

Question 3: Interactive TV services by CATV operators

* 1. How many CATV operators provide TV services in your country?
  2. How many subscribers do they have in average?
  3. Are they interested in IP based interactive TV services by themselves or OTT services such as YouTube?
  4. Which technologies are they interested in to provide IP based interactive TV services, DOCSIS, FTTH(PON), or others?
  5. What are the problems or what are the important points(\*) to realize IP based interactive TV services in these years?

(\*) For examples, cost, quality of video, resolutions, number of contents, quality of contents, and so on.

* 1. When will you plan to deploy IP based interactive TV services? And how do you solve the problems described in the response of the above (3-5)?
  2. What services other than retransmission of broadcasting do they consider as interactive TV services? For examples, digital signage, e-learning, e-health, e-government and so on.
  3. What will be the killer services in your IP based interactive TV services, and when will it be expected to realize?
  4. Regarding the above services you are concerning, do you they, or part of them, support accessibility functions, such as captions, sign-language interpretations, and audio descriptions? Or how do you think about the importance or deployment of these accessibility functions for interactive TV services? (\*)
  5. What is the goal of your IP based interactive TV services, if you defined it.
  6. How do you think about the relationship between OTT services and your future services?
  7. What do you expect that International or domestic standardization body do in order to deploy interactive TV services? For examples, what kind of requirements or solutions should be standardized or what kind of use-cases do you expect to learn from handbooks or guidelines published by such standardization bodies?

Question 4: Interactive TV services by telecom operators or others (broadband operators and/or mobile operators)

* 1. How many operators provide TV services in your country?
  2. How many subscribers do they have in average?
  3. Are they interested in IP based interactive TV services by themselves or OTT services such as YouTube?
  4. Which technologies are they interested in to provide IP based interactive TV services, FTTH(PON), or others?
  5. What are the problems or what are the important points (\*) to realize IP based interactive TV services in these years?

(\*) For examples, cost, quality of video, resolutions, number of contents, quality of contents, and so on.

* 1. When will they plan to deploy IP based interactive TV services? And how do you solve the problems described in the response of the above (4-5)?
  2. What services other than retransmission of broadcasting do they consider as interactive TV services? For examples, digital signage, e-learning, e-health, e-government and so on.
  3. What will be the killer services in your IP based interactive TV services, and when will it be expected to realize?
  4. Regarding the above services you are concerning, do you they, or part of them, support accessibility functions, such as captions, sign-language interpretations, and audio descriptions? Or how do you think about the importance or deployment of these accessibility functions for interactive TV services? (\*)
  5. What is the goal of your IP based interactive TV services, if you defined it.
  6. How do you think about the relationship between OTT services and your future services?
  7. What do you expect that International or domestic standardization body do in order to deploy interactive TV services? For examples, what kind of requirements or solutions should be standardized or what kind of use-cases do you expect to learn from handbooks or guidelines published by such standardization bodies?

Question 5: Policy and regulation concerns to start and deploy IP based interactive TV services in your country

(5-1) What is your policy and regulation concern to start and/or deploy IP based interactive TV services in your country?

(5-2) How do you think about institutional convergence in order to start and/or deploy IP based interactive TV services?

(5-3) Are there other regulatory issues about it?

(5-4) Are there any ideas that the standardization bodies should do to solve the above issues?

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Question 6: This project and questionnaire

(6-1) How do you feel about this survey project?

(6-2) Are you interested in the report of this project in future? And why do you feel so?

(6-2) How do you feel about this questionnaire?

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