Interactive Multimedia Services: Trend & Insights

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Incheon, Korea

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Interactive Multimedia Services: Trend & Insights

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Postgraduate Studies in Business Administration

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IEEE Broadcast Technology Society

“The technologies to deliver information and entertainment to audiences worldwide, at home and on the go.”

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Outline

• Integration of Broadcast with Broadband
• Technologies of IBB, standards
• Architecture, Model of IBB
• Applications and Services of IBB
• Freeviewplus, Hybridcast
• Summary
What is this?

MALAYSIA'S AWESOMEST INTERNET TV

- 30 days unlimited access. FREE!
- Thousands of TV shows, movies and more.
- Stream on your phone, laptop, tablet or TV.
- You can even Download & Watch Offline.
- Only RM8/month!

HOW TO GET STARTED
(We're super easy, promise!)

- Go to www.iflix.com
- Click Start your FREE one month trial
- Choose to sign up with Facebook or Email
- Create your password and...
- You're in. Let's play!
Where are they?

UniFi has your back with 1 YEAR of iflix, brought to you by TM (worth RM96)!

So you're a UniFi customer?
Connect to your UniFi Network to get started!

IFLIX.COM

Watch More
Is affordable? Quality?

Are you on UniFi? Get instant iflix brought to you by TM!

1 year of iflix is all yours (worth RM96)!
Connect to your UniFi Network to get started!

IFLIX.COM

Watch More

84 Comments  128 Shares
Linear TV audience

• Linear TV audience is growing all around the world

[Source: IHS – ScreenDigest]

• Cross-platform Television Viewing Time FY 2012

Note: Forecast from 2012 // * 2020 forecast by EBU. Non-Linear includes DVR
Type of VOD Services Consumed

- TV & Film services (e.g. Netflix/Lovefilm): 16%
- Long form video (e.g. Catch-up TV): 40%
- Short form video (e.g. Youtube): 53%

Source: Ofcom, 2013 (adapted)
## Classification

<table>
<thead>
<tr>
<th>(Semi interactive) traditional broadcast networks</th>
<th>Video service with managed QoS</th>
<th>Video service with unmanaged QoS</th>
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<tr>
<td>Traditional</td>
<td>1 Linear TV</td>
<td></td>
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<tr>
<td></td>
<td>2 Linear VoD</td>
<td>Wired IBB</td>
</tr>
<tr>
<td></td>
<td>3 Linear VoD</td>
<td>Wireless IBB</td>
</tr>
<tr>
<td></td>
<td>4 Linear VoD</td>
<td>IPTV/HFC</td>
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<td></td>
<td>5 Linear VoD</td>
<td>Internet TV</td>
</tr>
<tr>
<td></td>
<td>6 Linear VoD</td>
<td>Internet</td>
</tr>
<tr>
<td></td>
<td>7 Linear VoD</td>
<td>3/4G</td>
</tr>
</tbody>
</table>
A service that simultaneously provides an integrated experience of broadcasting and interactivity relating to media content, data and applications from multiple sources, where the interactivity is sometimes associated with broadcasting programmes.

[Source: Definition in Recommendation ITU-T 1205]
Application types

• Broadcast-oriented managed application
  – Service associated application with enhancement
  – Can continue running if application signalling in a newly selected channel instructs AUTOSTART to the same app.

• Non broadcast-oriented managed application
  – "Stand-alone application" accessible to broadcast resources under the permission given by broadcasters

• General application
  – "Stand-alone application" not allowed for simultaneous presentation with broadcast programmes
• ARIB STD-B24, Vol. 4 defines syntax and delivery of application signalling
  – Signalling by Application Information Table (AIT)
  – MPEG Section format and XML notation are defined
  – URL and identification information for application
  – Priority information for execution of data broadcast content and Hybridcast application

• Delivery of AIT
  – Elementary stream which conveys MPEG section formatted AIT
  – XML documents transmitted by DSM-CC data carousel
  – Acquisition from the server(s) on the Internet
Service Associated IBB application

An application that is part of the integrated broadcast and broadband (IBB) DTV service tuned to by the user at a given time.

[Source: Definition in Recommendation ITU-T J.205]
Life cycle and types of applications

- **Current channel**
  - Program 1 starts
  - Control to start App #1 from broadcast
  - Program related app to Program 1
  - App #1

- **Channel 1**
  - Program 1

- **Channel 1**
  - Program 1 ends
  - Control to stop App #1 from broadcast
  - Program related app to Program 2
  - App #2

- **Channel 1**
  - Program 2

- **Channel 2**
  - Program 1

- **Change a channel**
  - Control to start App #2 from broadcast
  - App #2 terminated due to channel change
  - App #3 continues to run regardless of changing a channel

- **Stand-alone apps**
  - A user chosen app starts at anytime by a user
  - App #3

  - A user terminates the app at anytime
The ITU-R SG6 are currently studying the Integrated Broadcast-Broadband (IBB) Systems, and based on the Recommendations established at ITU-T SG9, in July 2013

- they established the Recommendation ITU-R BT. 2037: General requirements for broadcast-oriented applications of integrated broadcast-broadband systems and their envisaged utilization,
- in February 2014 they also established the Recommendation ITU-R BT. 2053: Technical requirements for integrated broadcast-broadband systems

Currently working towards a new Recommendation ITU-R BT. [IBB-SYSTEM]
## ITU Texts related to IBB systems

<table>
<thead>
<tr>
<th>Category</th>
<th>ITU-R</th>
<th>ITU-T</th>
</tr>
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<tr>
<td>Requirements</td>
<td>Rec. BT.2037</td>
<td>Rec. J.205</td>
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<td></td>
<td>Rec. BT.2053</td>
<td></td>
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<tr>
<td>Reference Architecture</td>
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<td>Rec. J.206</td>
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<tr>
<td>System</td>
<td>Rec. BT.2075</td>
<td>DNR J.acf-spec</td>
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<tr>
<td>Information Doc.</td>
<td>Rep. BT.2267</td>
<td></td>
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</table>
IBB systems in ITU Texts

<table>
<thead>
<tr>
<th>ITU Text</th>
<th>Systems</th>
</tr>
</thead>
</table>
| Rec. BT.2075   | • HbbTV 1.5 & 2.0  
                 | • Hybridcast 2.0 (+ARIB STD-B62)  
                 | • HTML5 based smart TV platform                                                                 |
| Rep. BT.2267   | • HbbTV 1.5 & 2.0  
                 | • Hybridcast 2.0 (+ARIB STD-B62)  
                 | • Enhanced BML for simple IBB  
                 | • HTML5 based smart TV platform  
                 | • Ginga
• Wired Cu (Copper) or Fibre
• IBB - Integrated Broadcast Broadband
• Three systems
  1. HbbTV
  2. Hybridcast - Japan
  3. iCon, now HTML5 based smart TV platform - Korea
  4. Enhanced BML for simple IBB
  5. Ginga
• MHP - Italy was considering MHP
• Italy has moved to HbbTV
What is HbbTV?

- Innovative services can be offered directly on a "Connected TV" or on an appropriate set top box, without the consumer having to buy extra equipment using HbbTV technology.
- The Hybrid Broadcast Broadband TV (HbbTV) is a new international standard.
- HbbTV standards are
  - developed by the "HbbTV Association"
  - published by ETSI (European Telecommunications Standardisation Institute)
- HbbTV launched in Australia on September 2014, July 2015 NZ and may be in Malaysia in 2016.
- It is also in the process of being tested in Indonesia, Myanmar, Vietnam, Thailand and Singapore.
IBB Basic System Architecture

- **Broadcasters**
  - Servers
  - Programme related metadata, etc.

- **Service Provider**
  - Servers
  - Web services for Apps.

- **Network**
  - Applications
  - Communication by Apps.

- **Receiver**
  - Application
  - API call
  - Receiver functions
  - API
  - Device collaboration
  - Companion Devices

- **Applications**
  - App
  - App
Countries Adopting HbbTV

- In Asia-Pacific Australia, New Zealand, FreeviewPlus
- Malaysia
- Vietnam
- Indonesia
- Myanmar
- Thailand
- Singapore
- …
Freeviewplus NZ

- NG FTA of NZ
- Game changer
- TVNZ, Maori TV and Mediaworks
- 19 Live channels
- On-demand content from 3 broadcasters
- FTA+VOD
- STB NZ$150, approx. US$ 100 (unified)
- Rx - Panasonic, LG, SONY
- Agnostic to the content is consumed
• Launched in Sep 2014

• STB AUS$129 (approx. US$92)

• Aggregation and Curation (a range of activities and processes done to create, manage, maintain, validate, deliver a component of media)

• Samsung-2015 and range of Rx
Interactivity

• Robust App Runtime Environment with HTML5 support

• Based on HbbTV 2.0 with restrictions and extensions
  – HbbTV 2.0 was published earlier this year
  – 20+ extensions being documented, several based on ATSC: A/105 (aka “ATSC 2.0”), now in Candidate Standard phase
  – Changes being documented due to ATSC 3.0 IP delivery solution (HbbTV is based on MPEG-2 TS)
ARD connects HbbTV to second screen

- ARD connects HbbTV to second screen
NRK outlines HbbTV future
HbbTV deployment

USA - ATSC is in active liaison with HbbTV to use the technology as part of ATSC3.0.

- Live
- Planned

- Hungary - All Antenna Hungary channels on the terrestrial platform are HbbTV enabled.
- Slovakia
- Czech Republic
- Poland
- Finland
- Austria
- Germany
- Denmark
- Switzerland
- France
- UK
- Senegal
- Italy
- Turkey
- Russia - The Russian Television and Broadcasting Network trials begun in 2013 with a formal launch expected soon.
- Namibia
- South Africa
- Australia
- New Zealand
- Malaysia
- Vietnam
- Hybridcast
- 2013 Sep
- Broadcast-oriented managed applications
- Standardised at IPTV Forum, Japan
- Submitted to ITU for world standardisation as a IBB system
Hybridcast system concept

- Broadcast (simultaneous delivery, high-quality, reliable)
- Communications (able to respond to individual viewer's request)
- Network cloud
- Additional program-related information
- CGM, SNS
- Content management/delivery technology
- Content rights protection technology
- Viewer private information protection technology
- Enriched viewing experience
- Synchronized playback technology
- Mobile terminal linking technology

HybridCast Receiver

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Hybridcast system architecture
Tx/Rx system architecture for sync Brct

Transmitter/Receiver system architecture for synchronized broadcasting
Examples of Hybridcast programmes

Nippon TV
Price of items are fixed by voting of views, utilizing interactivity of Hybridcast.

TV Asahi
Popular animation characters are controlled by viewers smartphones by Hybridcast function.

TBS(Tokyo Broadcast System Television)
Graphical game/players data are shown on the screen of Girls Football game(live program)

TV Tokyo
Viewers participate Invader shooting game program by Hybridcast
Examples of Hybridcast programmes

CBC (Chubu-Nippon Broadcasting Co., LTD.)

Japanese scripts are translated to Foreign scripts by machine-translation

Local area information (Disaster, traffic, tourism, local event) is shown on TV screen, referring to Local information site (“Hot-furusato”)

YTV (Yomiuri Telecasting Corporation)

1. Activate the application.
2. Access to the Travel Guide.
3. Download coupons, travel info to mobile device.
4. Use coupons and info at the destination. (ex. Purchase a discounted item at a store)

Attracting Tourism, Promotion of local areas
Examples of Hybridcast programmes

TBS (24hrs, 2014.10 onward)

Customized layout of various data contents on Screen by viewers.
News video clips could be replayed on portable devices.
More detail/rich/graphical information (weather, traffic report) via internet.

Nippon TV (24hrs, 2014.12 onward)

News, weather, program info, Social index of TV programs are available.

Fuji TV (24hrs, 2015.1 onward)

Weather, disaster information, news, EPG interactive services (game etc.)
Hybridcast Rx

- As of January 2015 [Ref. http://www.iptvforum.jp/hybridcast/receiver.html, etc.]

<table>
<thead>
<tr>
<th>Brand</th>
<th>TV Size</th>
<th>Smartphone applications</th>
</tr>
</thead>
<tbody>
<tr>
<td>TOSHIBA</td>
<td>32V~84V</td>
<td>RZHybridRemo [Android, iOS]</td>
</tr>
<tr>
<td>Panasonic</td>
<td>40V~85V</td>
<td>TV Remote2 [Android, iOS]</td>
</tr>
<tr>
<td>SHARP</td>
<td>40V~80V</td>
<td>AQUOS Connect [Android, iOS]</td>
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<tr>
<td>MITSUBISHI ELECTRIC</td>
<td>29V~65V</td>
<td>—</td>
</tr>
<tr>
<td>SONY</td>
<td>32V~85V</td>
<td>TV SideView [Android, iOS, Windows8.1]</td>
</tr>
<tr>
<td>LG</td>
<td>32V~65V</td>
<td>LG Hybridcast [Android, iOS]</td>
</tr>
<tr>
<td>FUJITSU</td>
<td></td>
<td>PC (TV tuner model)</td>
</tr>
</tbody>
</table>
Standardization structure of Hybridcast

Technical Standard

IPTVFJ STD-0010
[ System specification ]

IPTVFJ STD-0011
[ HTML5 browser specification ]

ARIB STD-B24
[ Application signaling ]

2K Hybridcast

Core standards by IPTVFJ

ARIB STD-B62
[ Hybridcast for UHDTV ]

ARIB STD-B60
[ MMT Protocol Suite ]

Operational Guideline

IPTVFJ STD-0013 (for broadband)

ARIB TR-B14/15 (for broadcast)

Operational Guideline for UHDTV
[ Under development]
• KBS launched iCon in Korea on March 19, 2013

• iCon is the first terrestrial hybrid TV (OHTV) service in Korea

• The service includes EPG, program search, video clip, vote, etc.

• Advertising market share on the Internet has been rapidly increasing and a smartphone is the most necessary media for the age group under 30’s
About half of viewers in Korea use a smartphone while watching TV.

In future, OHTV 2.0 service will be provided by KBS.

The service uses HTML5 and second screen devices such as smartphones or tablets.

KBS launched VOD service in fourth quarter of 2014.

Now on HTML5 based smart TV platform.
Specifications for IBB systems

- **Hybridcast**
  - IPTVFJ STD-0010, “Integrated Broadcast-Broadband system specification V1.0”, IPTV Forum Japan and IPTVFJ STD-0011, “HTML5 Browser specification V1.0”, IPTV Forum Japan

- **HbbTV**
  - ETSI TS 102 796 V1.2.1, “Hybrid Broadcast Broadband TV” and ETSI TS 102 809 V1.2.1 “Signaling and carriage of interactive applications and services in Hybrid broadcast/broadband environments”

- **OHTV - Korean system** TTAI OT-07.0002, now HTML5 based smart TV platform

- **DVB-MHP**
  - ETSI TS 102 728 V1.2.1, “Globally Executable MHP (GEM) specification 1.3 (including OTT and hybrid broadcast/broadband)”
Mobile OTT – Astro on the Go

- Collaboration between TM and Astro
- Astro – well known DTH provider in Malaysia
- Telecom Malaysia, National Telco in Malaysia
- Use Apps to interface
Content on Mobile

Be part of the action, even when you’re on the go

Enjoy LIVE coverage of this week’s spectacular action wherever you go

Sign up now

How to sign up
Mobile TV – mmbi

- NOTTV
- April 2012
- On NTT Docomo devices
- ISDB-Tmm
- Sub-spec of ISDB
- Mainly used for time-shift services
- Uses XML based BML meta data
- Encrypted
- MEG4 AVC/H264
Smooth A2D & maximise the digital dividend

Expectations of ITU:

• Policy and regulatory frameworks for digital terrestrial broadcasting, including mobile television and spectrum refarming due to the digital dividend

• Digital broadcasting master plans for transition from analogue to digital broadcasting, including mobile TV and IPTV

• Appropriate mechanisms for conversion from analogue to digital archives and mechanisms for sharing of content

• Provision of assistance in the field of interactive multimedia services to broadcasters in the Asia-Pacific region
Broadcasting in the Internet World - ATSC 3.0

**PRODUCTION & CONSUMPTION**

- **TV APPLICATION**
  - (interaction layer)

**Base Media File Format**
- (ISO-BMFF)

**TRANSPORT**

- **DASH**
- **HTTP**
- **TCP (Bidirectional)**
- **UDP (Unidirectional)**

**DATA LINK**

- **IEEE AND/OR 3GPP PHYSICAL LAYERS**

**DEVELOPMENT**

- **BROADBAND INFRASTRUCTURE**
- **TERRESTRIAL**
Broadcasting in MPEG world

[Diagram showing various broadcasting systems and technologies, including DVB, MPEG, DASH, HTTP, TCP, IP, and physical layers like satellite, cable, and broadband.]
## Classification

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<tr>
<td></td>
<td>DTTB/Sat</td>
<td>OTT</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>(Interactive) integrated networks</th>
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</thead>
<tbody>
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<td>Linear VoD</td>
<td>OTT - wireless</td>
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<td>Internet</td>
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<td>MTV</td>
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<td>3/4G</td>
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</table>

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<tr>
<th>(Fully interactive) duplex networks</th>
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<td></td>
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<td></td>
<td>OTT</td>
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<tr>
<td></td>
<td>Wireless OTT</td>
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Summary and Recommendations

- OTT – over unmanaged networks, are improving
- IPTV – less penetration
- IBB – middle ground
- HbbTV, Hybridcasting, HTML-5 Smart TV platform, ...
- Technologies are evolving
- How we build infrastructure using such Technology will determine the services
- Regulation especially policies will play a key role in it
- Assurance to access to information - No information divide (Dr AMAL Punchihewa)
- Less harm to the society
To summarise

- Access to content without gatekeepers
- Foster innovation in Hybrid broadcasting
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