What evolution of content forms should cable networks anticipate?

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WHERE WAS BROADCAST TECHNOLOGY IN/ABOUT 1967?

- **SDTV Colour TV** (PAL, SECAM, NTSC) already well developed
- **HDTV idea** already there (Dr Takashi Fujio, in 1964)
- **Data broadcasting** nearly there - in early 1970s (Teletext, Captain, Antiope)
- **Data services by telephone lines** nearly there – in early 1970s (Viewdata, Videotext)
- **3D slide HMDs**
- **Home video recording** not far away
WHAT IS BROADCAST TECHNOLOGY IN 2017?

• HDTV relatively well developed
• UHDTV services started
• Broadcast multimedia delivery widely available
• Internet multimedia delivery widely available
• Early Virtual Reality services
Which forms are evolving?

- Video formats and systems
- Audio formats and systems
- New media forms: virtual reality
- New media forms: augmented reality
- Access systems
- Voice activation
- Hybrid systems
- 3DTV
Video formats

- Image quality continues to increase
- A number of parameters that contribute to quality are involved: image resolution, frame rate, dynamic range, colorimetry.
- New formats use 1080p1920 as building block
- 2K, 4K, 8K, 12K, 16K, 32K, HDR, HFR in prospect?
- Basic specs. ITU BT. 2020, BT 2100.
**IMAGE RESOLUTION**

What does “more of the same mean” here?

<table>
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<tr>
<th>System</th>
<th>H. res</th>
<th>V. res</th>
<th>Pixels per frame</th>
<th>Compressed Bit rate H264</th>
<th>HEVC</th>
<th>Next Gen. Comp.</th>
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GREATER IMAGE RESOLUTION – AN INEVITABLE TRENDS?

• Why more detail?
• “Simple acuity (60c/d)” is not all there is. “Hyper acuity (120c/d)” for feature localisation may also be important.
• Depth perception is improved by better texture gradient.
• There is degradation between the camera and the TV screen and domestic TV sets vary in quality.
• Cinema wide screen aspect ratios can be attractive.
• Bigger numbers always appeal to the public.
• Compression technology continues to improve.
Audio formats

• New concepts in audio – the ‘sound element’ sound plus metadata
• Receiver renderer translates to LS signals
• Channel based coding
• Scene based coding (ambisonics)
• Object based coding
• ITU-R BT 2051
Access Systems

- Subtitle systems - TTML based systems (for UHDTV)
- Audio descriptions (closed).
- Signing (open and closed).
- Clean audio (Rx or transmit).
- Multiple options using NGA for new services
- W3C/IRG AVA
Integrated/Hybrid Systems

- Combination of linear and non-linear content
- Companion screens
- Plurality of standards – HbbTV, Hybridcast,…
- Latest systems have arranged time synchronisation
- ITU-R 2267
Voice activation

- AI and IoT used
- Control of media system
- Advice and suggestions
- Will take time to develop universally - 7000 different spoken languages
- May become a “gatekeeper” for content
PERSONALISATION AND VOICE ACTIVATION

• Voice activation will become more and more important for everything, including television and media.
• But we will need more sophisticated ‘agents’ in the TV set – a friendly face that recognises you, listens to you, and talks to you.

I think I have some programmes you may be interested in

Oh, and your mother called
3D TV?

- Simple stereoscopic L and R eye images systems did not prove popular.
- Unwieldy glasses, unsuitable for multitasking, and fatigue of the visual cortex. Horizontal disparity only.
- Future systems need to provide more object wave information (phase) and both horizontal and vertical disparity.
- New tools being developed such as Integral TV.
- DVB standards.
Virtual reality

- 360 video
- 3DoF (Head movement only)
- 6DoF (Head and body movement)
- Mono and stereoscopic video
- JTC1 MPEG OMAF
- Limited content duration
- May be a niche
Augmented Reality

- Addition of multimedia to image
- IEEE standards activity
- Mixed Reality – combines two realities
- Uses in both programme production and programme distribution
- Can be used for access services
- May be a niche
Conclusions

• Important for the developers of cable networks to take into account the evolution of content technology.
• Public expectations rise as the public educates itself to its viewing context.
• Most important is to develop systems that can adapt to evolving content forms.
• The most critical evolution is probably image quality and personalisation.
THANK YOU FOR LISTENING!

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