

DIGITAL BROADCASTING SYMPOSIUM 2019



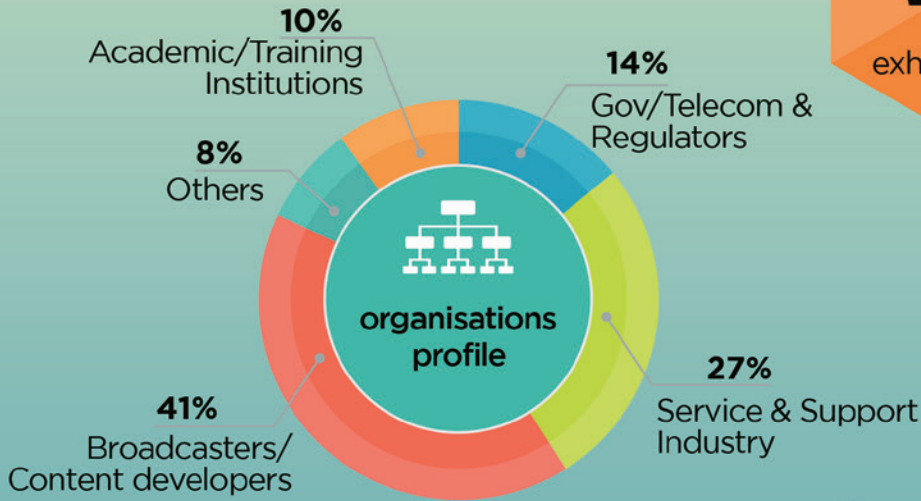
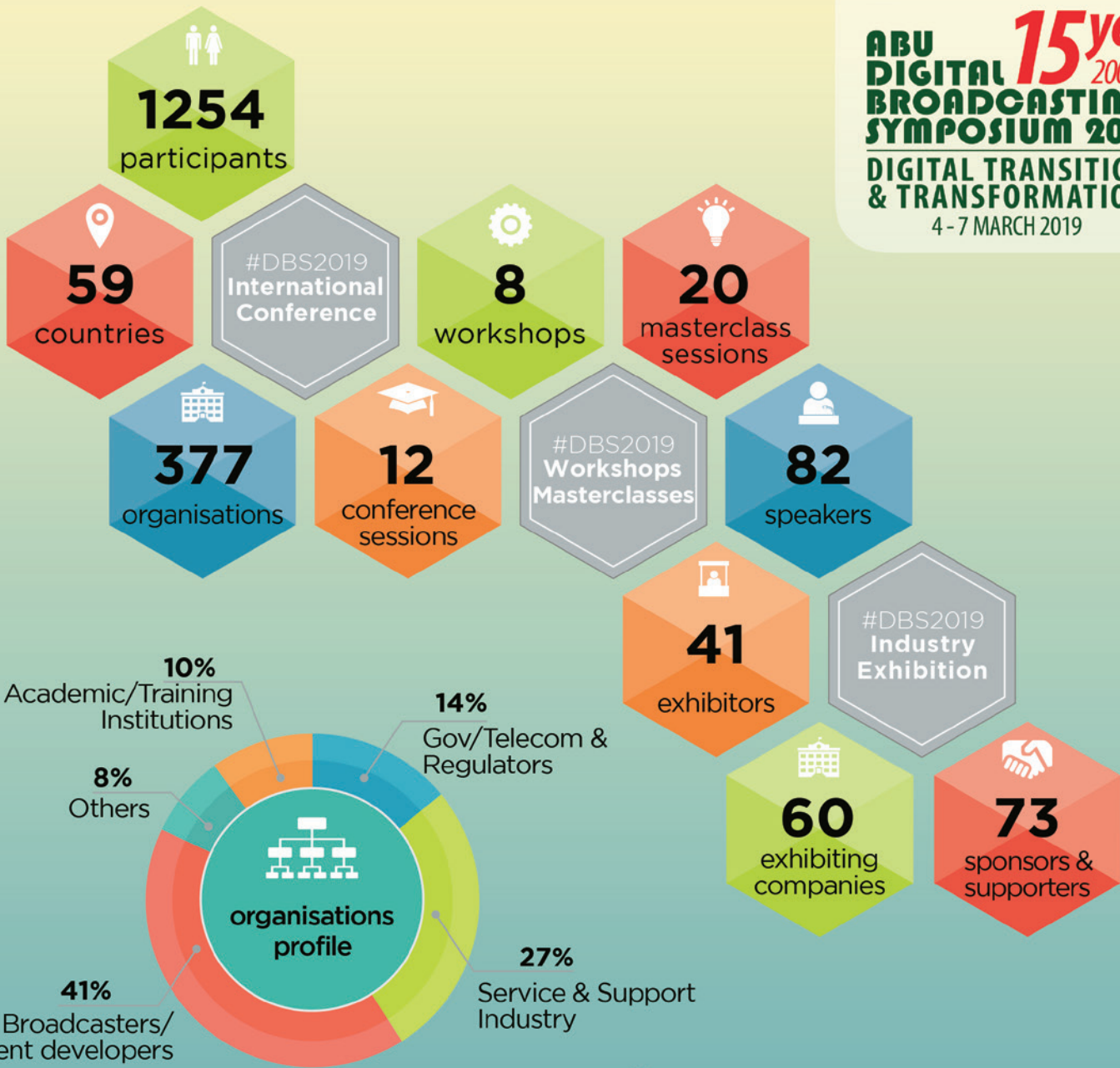
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ABU **DIGITAL BROADCASTING SYMPOSIUM 2019**
15 years 2005-2019
DIGITAL TRANSITION & TRANSFORMATION
 4 - 7 MARCH 2019



Participants' Profile



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The DB Symposium, with its international conference, industry exhibition, workshops and masterclasses provides a platform for the broadcast and media industry stakeholders to network, share and experience wide-ranging technologies, advanced solutions and innovative content ideas. The event provides international and regional exposure to our members and the media industry.
 The Digital Broadcasting Symposium is an annual event organised by the Asia-Pacific Broadcasting Union (ABU)



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Go Digital to Stay Relevant, Minister tells Broadcasters



YB Gobind Singh Deo, Minister of Communications and Multimedia, Malaysia

Broadcasters have no choice but to use mobile and Internet-based delivery systems to compete and remain relevant, Malaysia's Minister of Communications and Multimedia told the Digital Broadcasting Symposium.

In his ministerial address, Mr Gobind Singh Deo said digital technologies and innovations were transforming the way organisations and businesses operated, and the way information was shared and exchanged.

"Like other industries, these innovations are forcing the broadcast and media industry to evolve by incorporating and adopting these technologies and solutions.

"The evolving behaviour of consumers, the growing strength of online and internet-based media delivery platforms, together with the exponential increase in mobile devices – this is the driving force that is changing the whole media landscape."

Mr Gobind said audiences today demanded that broadcasters make content available to them on their choice of device at their preferred times.

"This is a drastic change from the traditional way broadcasters used to operate. We as broadcasters serving the public need to accept this and make necessary changes in our operational model to serve the public.

"If we don't, then it is highly likely that the audience will switch to other providers who meet their requirements."

Mr Gobind said many broadcasters in the region are still struggling with their move from analogue to digital. This transition was not easy.

"We have been working very closely with countries in the region which have successfully completed the transition, as well as with ASEAN. I am happy to note that Malaysia is moving swiftly towards this goal.

"We have made huge investments to get the infrastructure ready for the digital transition and with the support of both government and private stakeholders involved, we hope to announce our analogue switch-off soon."

He was happy to note that Malaysia's public broadcaster, RTM, had actively been transforming itself in this digital wave in recent years, and was able to offer the public the benefit of these technologies now.

Mr Gobind encouraged fellow broadcasters from the region to make use of events and forums such as DBS to learn from the experts and work together to implement digital solutions quickly.

"The ABU has always been supportive of such endeavours from its members and the industry, and I believe they will continue to support them in the future."



Mr Shakib Ahmad Shakir, KKMM Deputy Secretary General (Policy), YB Gobind Singh Deo, Minister of Communications and Multimedia, Malaysia and Dr Javad Mottaghi, ABU Secretary-General

Digital Transition & Transformation



Joan Warner, CEO, Commercial Radio Australia

The 2019 ABU Digital Broadcasting Symposium was held on 4-7 March at Hotel Royale Chulan, Kuala Lumpur. This symposium, themed 'Digital Transition & Transformation' is held once annually by the ABU, and was the 15th in the series. Prior to the conference proper, a half day workshop on DVB was held on the morning of 4 March, followed by an afternoon workshop on DAB+. The three-day conference, 20 Masterclass sessions covering five topics, and eight workshops together with exhibit booths, provided a unique opportunity for attendees to have access to information on all the various aspects of broadcasting, ranging from terrestrial to satellite. The symposium attracted many participants representing broadcasters, telcos, regulators, manufacturers and other industry players.

Opening Session

The Industry Keynote address entitled 'Seizing the Digital Opportunity' was delivered by Joan Warner representing



Dr Javad Mottaghi, ABU Secretary-General, presenting a token of appreciation to Ms Joan Warner

the principal sponsor, WorldDAB. She reiterated that the broadcaster's role in shaping the future and saving lives during disasters is more important than ever before. This was demonstrated during the recent forest fires in California, where battery operated radio sets played a crucial function in keeping the affected population in touch with disaster relief centres as well providing timely weather updates. These sets overcame the blackspots, where broadcast content was still available, despite the mobile network transmitters being knocked out. In Australia, millions were raised for the Queensland flood crisis and stations doled out essential goods such as food, water and milk. All Townsville radio stations had 24/7 live and local broadcasts, providing emergency updates.

Digital improves the customer experience in various ways, including waking up to breakfast radio on DAB+. They can also listen via a station app on the bus or train, and check in on radio on Facebook. It is a breeze to find your station brands across different platforms, which is now made even easier with voice technology. WorldDAB has updated user experience guidelines for automakers, outlining how radio should be easily found and displayed in the multimedia system. The guidelines make allowance for station logos, programme information, internet integration and voice control of radio. This is radio's challenge in the car interior, as dashboard screens go supersized, in tandem with the trend in using voice to control the Internet of Things (IOT).

Digital can improve the experience for advertisers as DAB+ offers more targeted and integrated content, with innovative marketing opportunities. It makes the radio buying experience easier through automated holdings, and moves to more effective ways to trade broadcast, digital and podcast inventory.

Technologies & Standards: New Developments and the Next Wave

The first session was moderated by Mr Hamid D Nayeri of IRIB-Iran and the panelists were Dr Peter Siebert, DVB Project Office, Lindsay Cornell, BBC, Mats Ek, Progira and Akira Kiuchi, NHK. They elaborated on the developments of the various broadcast/telecommunication technologies over recent years and the improvements achieved. Broadcast to handhelds have been tried often with different technologies such as DVB-H and MediaFLo. However, all high-power high tower-based schemes (and satellite) have failed.

There are clear commercial reasons like extra costs for handsets, networks and content and no specific business model compensates for this. There are also technical challenges, especially restricted indoor reception as compared to mobile outdoor or rooftop. This point can be discerned by the findings that the signal level difference between Fixed DTT and Mobile TV is about 47dB for roof top vs indoor mobile reception (Source: Kent Walker, Qualcomm, DVB World 2017). Coverages predictions indicate that many more transmitter sites are needed to provide handheld reception, requiring the use of a dense cellular infrastructure. Thus,

handheld indoor reception is a demanding case, resulting in a trade-off between capacity, coverage and cost.

Entering this scenario is 5G, with its Fully Evolved Multimedia Broadcast Multicast Service/Enhanced TV standard. The 3GPP Release 14 specifies for dedicated carriers with up to 100% MBMS allocation and increased guard interval for bigger SFN networks. First trials with the new FeMBMS are taking place in Germany, and further improvements are expected to be announced with Release 16. DVB-T2 has higher spectrum efficiency, compared to FeMBMS which is not as cost efficient. Potential 3GPP-DVB cooperation is being explored, with two scenarios under consideration. The first is enabling DVB Services on 5G connected receivers and the second is installing DVB-I as a fully compatible service layer on top of 5G enTV/FeMBMS.

FeMBMS is LTE based, using OFDM like DVB-T2 and incorporates selectable lengths of Cyclic Prefix which allows the usage of SFN. Capacity is from 1 to 33 Mb/s, allocated in resource blocks and bandwidth options range from 1.4 to 20 MHz. A variety of modulation and coding schemes, comparable to DVB-T2 namely QPSK, 16QAM, 64QAM, 256QAM) are offered. FeMBMS may replace DVB-T2 networks even when using traditional broadcast infrastructure but it is about 20-30% less efficient compared to DVB-T2 in 8 MHz Channel. It could also provide mobile/indoor reception to handheld devices, but then Low Power Low Tower based networks need to be used.

On 1 Dec 2018, new 4K/8K Advanced Satellite Broadcasting was launched in Japan. 8K was offered as a single service whilst 4K was available with 16 services. Transmission was designed to combat rainy weather by implementing Hierarchical Modulation, in the form of 16 Amplitude PSK (APSK) with the more robust QPSK.



Hamid D Nayeri, IRIB-Iran, Dr Peter Siebert, DVB, Akira Kiuchi, NHK, Lindsay Cornell, BBC, and Mats Ek, Progira

Broadcasting Business and Strategies for the Future

The Moderator was Asaad Bagharib, Thinking Tub Media Ltd, with the panel comprising Panna Dey, Dolby, Grant Blackley, Southern Cross Austereo, Nick Piggott, RadioDNS, Fabio Gattari, Etere, Markus Fritz, Eutelsat, Dennis Breckenridge, Elevate Broadcast, and Ruxandra Obreja, DRM.

The four elements of the Next Gen Experience comprise of more pixels, better pixels, faster pixels and better sound. There are more pixels as the 8K mode has 7,680 x 4,320 pixels, better pixels, with wider colour gamut as 12 bits/pixel are used and faster pixels at 120 frames/sec. More pixels deliver a picture that is 16 times the resolution of present HDTV or 2K. Better pixels result in a High Dynamic Range (HDR), mimicking real viewing experiences to excite senses, physical and emotional responses. The high frame rate portrays better and smoother motion, while the wider colour gamut allows the reproduction of almost all surface colours.

Delivery of sound is better because it is multi-dimensional, fully immersing the viewer with sound objects that move around and above thus adding the perception of height dimension. The objects describe position, size, diffusion and require dynamic metadata. Immersive sound engages human sensory system more naturally by allowing the sensors to process information more similarly to the natural world

OTT literally means Over-the-Top, a term used for delivery of video streams via the internet. It bypasses traditional distribution channels, with no cable or satellite service needed. The service can be streamed over the public internet, with lower costs than the traditional methods of delivery. OTT is developing at a rapid pace in transforming the TV industry and reshaping content distribution models, consumer viewing habits and advertising. There is growth in OTT advertising with ad targeting, personalisation, measurement and engagement.

Consumers are using OTT because they can choose their TV series based on the programming. OTT platforms offer digital access to programs at a lower cost, with the added convenience of media consumption on the move, with smartphones and tablets. The market opportunities are considerable as the digital data can be measured, enabling advertisers to understand the cost of media, placement of ads and its success. Monetisation of content can be increased with dynamic ad insertion capabilities. OTT can reach out and engage relevant audiences while re-targeting capability based on audience data.

A challenge for OTT is fragmented media consumption, where young adults favour streaming services. There are a variety of industry standards, gaps in ad delivery infrastructure and the cost of IT infrastructure is high. It is best to use a Content Delivery Network (CDN) which is a system of distributed network servers. CDN optimises delivery of content via the internet, minimising latency and brings content to many



Asaad Bagharib, Thinking Tub Media Ltd, Grant Blackley, Southern Cross Austereo, Nick Piggott, RadioDNS, Dennis Breckenridge, Elevate Broadcast, Markus Fritz, Eutelsat, Fabio Gattari, Etere, and Ruxandra Obreja, DRM

places at once. It also allows the service provider to multiply OTT streams without purchasing unnecessary bandwidth.

Cybersecurity and Media-Action Required

Moderated by Masakazu Iwaki, NHK, the panelists were Hamid Dehghan Nayeri, IRIB-Iran; Kathryn Brown, Commercial Radio Australia, Syed Mokhsein Syed Mansor, MCMC-Malaysia, and Mariette Peters-Goh, WongPartnership LLP, Singapore. A recent study conducted by Newscycle Solutions had revealed that 52% of news media companies experienced data breach or other forms of cyber-attack, in recent years. Most of these attacks happened on news media websites, where hackers tried to take over the site to further their agenda and interests.

We need to be concerned about Cyber Security as the broadcast industry is quickly adopting virtualised cloud services, for financial or agility reasons and multi-protocol delivery of content over IP to a wide range of consumer devices. The industry is also offering OTT services for direct consumer delivery of digital content and IP-based technology to support the bandwidths and speeds of next generation advanced television systems. These technologies create an environment that is more connected and hence more vulnerable to cyber threats.

Cyber threats may result in the theft of valuable content, piracy, including pre-release material. The result is damaging to the reputation of a news organisation together with leakage of data, such as financial information, personal data and e-mails. Other bad effects are software/file corruption or encryption and some of these could result in a media/broadcast operation's inability to continue operation.

The ABU is working with World Broadcasting Union to combat this, by setting up study project tasks, specifically on Cybersecurity and threats to broadcast and media. It encompasses collaboration between the different Broadcasting Unions and sharing threat information, actions taken and preventive methodologies. Other initiatives taken are continuous education and Information to member organisations in the form of seminars, workshops, conferences and recommendations. WBU documents include "WBU Cyber Security Recommendations for Media Vendors' Systems, Software and Services" published on January 2018 and "WBU Recommendations for Core Cyber Security Controls" issued on October 2018. Next will be "Cyber Security Requirements for Cloud Service Providers" and work on it is due to start in 2019.

Media is a high-profile target, attracting attention from all types of threats caused by occasional controversial statements made on air and objection to talent or programming from activist groups. Broadcasters have loyal listeners and lots of valuable information about them. Stations attracts hackers, snoopers and those who gain satisfaction from attempting denial of service on media sites. Cyber resilience can be acquired by updating antivirus protection for files and emails, procuring the latest firmware and software updates and installing firewalls that restrict the ports from being accessed remotely. There should be regular password changes by the users, as well as daily back up of files in cloud or hard drives with offsite storage. The employees should be educated in increased awareness of threats and undergo training to counter them.



Masakazu Iwaki, NHK, Hamid D Nayeri, IRIB-Iran, Mariette Peters-Goh, WongPartnership LLP, Singapore, Syed Mokhsein Syed Mansor, MCMC-Malaysia, and Kathryn Brown, Commercial Radio Australia

Big Data, Artificial Intelligence And Personalisation Of Media

The Moderator was Aale Raza, Whiteways Systems, with the panelists comprising of Deb Hishan, GfK, Masakazu Iwaki, NHK Japan, Asaad Bagharib, Thinking Tub Media Ltd, and Charles Sevier, Dell EMC. The portability and ubiquity of radio make it hard to undertake audience measurement but there many tools available such as diaries, meters and observations from streaming data. Hybrid RAM or Radio Audience Measurement (multimode) delivers a more holistic measurement of radio listening, by maximising completeness and granularity. A pilot study on audience measurement was conducted in Australia using wearable meter cum watches, E-diary pilot and smartphone app meter pilot. Analysis indicates that the meters are reporting incomplete listening and comparable patterns of listening when compared with diaries.

The pilot study also indicates that the participants had a sense of importance, were highly motivated and found the involvement, interesting and fun. The diary was comprehensive, non-invasive, and controllable, with most listeners jotting down the details required. Listeners liked the watch design, enjoyed wearing it and considered the step-counter as a bonus. However, they expressed privacy concerns and repeatedly forget to charge the battery. The app meter was easy to install, but again privacy concerns were expressed together with negative perceptions about battery drain.

Artificial Intelligence (AI) is assisting in the production of TV and Radio Programme, when viewed from the aspect of editing and forecasting. Speech synthesis is used for stock market reports and weather forecasting. Japanese sentence is synthesised from received data with fill in method, while the recorded words are connected and its time allocation adjusted by speech rate conversion technology. Speech is automatically generated from meteorological data sent from Japan Meteorological Agency based on announcer's experience. AI has learnt, how the announcer intonates and speaks with an interval.

Automatic audio broadcasting has reformed working-style by reducing the routine, repetitive task of the regional station announcer. It enriches regional broadcasting services by shifting working hours, to developing a regional programme. The development of quality speech synthesis technology has created an asset from NHK announcer's style of speaking. Automatic audio description is a form accessibility technology for visually challenged people and is enabled by XML sports data. In the past, TV reporters have been manually transcribing video footages such as interviews for accurate production. Utilisation of speech recognition systems is thus strongly recommended. The Rapid Transcription System produces transcripts from video footage both quickly and efficiently. The system has 80% Speech recognition accuracy, with user friendly application for correcting misrecognised words. A further development by NHK, is the real time recognition of information programmes, enabling closed captioning to be aired to viewers instantly.



Aale Raza, Whiteways Systems, Deb Hishon, GfK, Masakazu Iwaki, NHK, Asaad Bagharib, Thinking Tub Media Ltd, and Charles Sevier, Dell EMC

Migrating to IP – Standards, Strategies and Challenges

The session was moderated by Dr Fintan Mc Kiernan, Ideal Systems SEA, and the panelists were Yew-Jin Cheong, Rohde & Schwarz, Toshiro Mitsuyoshi, NHK, Torkel Aamodt Thoresen, Nevion, Peter Bruce, IABM, and Jonathan Triboulet, Skyline Communications.

Broadcasters are losing audiences and revenue to OTT operators and current SDI infrastructure won't be able to support the high bandwidth demand of 4K/UHD/HDR/HFR/WCG content. Satellite transmission is still too expensive compared to the IP contribution/distribution method. More and more solutions are based on Virtualisation and Cloud, which can leverage the commercial off the shelf (COTS) platform. The merging of IT and broadcast is happening at a faster pace. Video has become mainstream content consumed on the Internet and the line between Internet Professional Video and Broadcast Video has blurred.

The challenges of IP adoption include interoperability, as the IP Standards Set is not fully complete. More details are still under discussion and evaluation, such as single stream 5G Latency issue as the current latency can be as low as 2ms, but still not good enough for some programmes, like high-frequency-trading or soccer matches. Other challenges are Cyber security issues and the skillset upgrade of current broadcast operators and technical staff.

IP adoption has been slower than predicted due to interoperability concerns. Thus, SMPTE ST 2110 was ratified at the end of 2017, and looks set to drive growth in the adoption of IP technologies. End-users could increase their investment in IP enabling remote production workflows at events. The earlier SMPTE ST 2022 ratified in 2012, provided a single Serial Digital Interface (SDI), over IT networks using IP and Real-time Transport Protocol whereas the latest SMPTE ST 2110 conveys audio, video and data as separate flows across the network. Packetised data is contained or “encapsulated” inside other packets for transport. Information in headers is vital to make it all work but does represent an overhead. However, SMPTE 2110 needs a managed IP Network without any packet dropping.

NHK Japan has undertaken the implementation of IP for DTT network in SFN taking into account that there are 40 channels (470-710MHz) and about 2200 relay stations. An SFN is a network of transmitting stations that use the same frequency channel and carry the same data. Broadcast waves from each relay station have to reach overlapping area between adjacent stations within guard interval duration. IP networks are used as a backup, and the wired IP network area has been spreading rapidly. NHK has connected IP networks to the tops of mountains at an affordable cost. The problems of IP transmission for SFN are network delay, delay jitter and packet loss. The results are that delay time cannot be adjusted, slave synchronisation clock plus Broadcast TS cannot be regenerated and a program cannot be transmitted within the determined time of microwaves by Forward Error Correction (FEC) subsystem. Hence IP transmission equipment has been designed to contain a receiver buffer that absorbs the delay jitter, and a common clock which makes it possible to adjust delay time. The equipment can also regenerate BTS (Broadcasting TS) by synchronizing with common clock and lost packets are recovered by using the FEC.



Dr Fintan Mc Kiernan, Ideal Systems SEA, Torkel Aamodt Thoresen, Nevion, Jonathan Triboulet, Skyline Communications, Peter Bruce, IABM, Toshiro Mitsuyoshi, NHK, and Yew-Jin Cheong, Rohde & Schwarz

Digital Transformation – Workflow Enhancement, Media Management and Cloud Integration

The Moderator was Charles Sevier, Dell EMC, and the panelists were Paul Shutt, VIRZT, Aaron Alphonso, Macquarie Media Ltd, Johan Vanmarcke, Mediagenix, Tomas Chen, Sony, Bruno Burte, NOA GmbH, and James Taylor, Ideal Systems.

The new Media Asset Management (MAM) system comes with higher resource efficiency across multiple cloud infrastructure zones and increased automation, while leveraging Cloud Technologies to improve video production workflows and IT

return on investment. The MAM introduces a new smart transfer system, optimised search for millions of assets and extended media support.

MAM is now available across multiple cloud infrastructure zones where Media companies have the flexibility to access their content anywhere on Amazon Web Service. The new cloud infrastructure zones allow MAM to manage compute, storage and transcode resources across multiple cloud and on-premise zones. This technology is also extremely useful for connecting multiple physical data centres or production facilities under a single MAM. Support for this technology enables both cloud and hybrid architectures. This allows pre-existing infrastructures to be connected and augmented with the most attractive cloud services. Users can securely access content on MAM from any location, using the improved two-factor authentication in-cloud or on premise.

The complexity of multi-platform production and delivery is reduced by streamlined workflows where the station is managed with a single tool. The MAM automatically moves media where it's needed and when it's needed. It consolidates news, sports, promos, and programming. At the same time, it can produce for and deliver to any platform: broadcast, mobile, and online. Thus, using MAM as a platform can make content delivery workflows more efficient, whilst delivering superior ROI and maximise the value of the content. MAM scales as the organisation's needs grows/changes whilst using robust open APIs for simplified integration with other applications.

The core concept of Media Services Orchestration Platform is to ease the creation of viable broadcast platforms in the cloud. By working with the world's leading technology vendors it is possible to create modular broadcast solutions, automated and orchestrated with common DevOps and SDI tooling. Investing in fixed infrastructure for transient workflow spikes caused by moving archives between platforms is highly inefficient. Instead of purchasing or renting infrastructure, a cheaper alternative is a hybrid cloud solution. This solution removes the need to provide additional in-house capacity in terms of software and hardware. It can perform simultaneous pathways with no incremental pathway licence cost, associated with some workflow orchestration solutions. There are no fixed costs as pure 'on-demand' costing enables the workflows to exist in a 'cold-standby' state with no cost overhead. However, Cloud DevOps skills are required to initially setup and configure the workflows. It is also Inefficient for small numbers of assets.



Charles Sevier, Dell EMC, Paul Shutt, VIRZT, Aaron Alphonso, Macquarie Media Ltd, Johan Vanmarcke, Mediagenix, Tomas Chen, Sony, Bruno Burte, NOA GmbH, and James Taylor, Ideal Systems

Delivery Technologies for the Future – UHD, 5G and More

The session was moderated by Dr Peter Siebert, DVB Project Office, and the panelists were Andreas Streit, LS Telcom, Fumiki Uzawa, NHK, Jae Kwon LEE, KBS-Korea, Dr Les Sabel, WorldDAB, and Colin Prior and Simon Tsang of ENENSYS.

8K UHD TV Video Transmission System with Adaptive Rate Control for Mobile Live Production has been initiated by NHK in Japan. On December 1st, 2018, Japan started 4K and 8K ultrahigh-definition television (UHD TV) broadcasting. Japanese broadcasters have developed various kinds of equipment for UHD TV but mobile wireless links for live productions were not ready.

Marathon races are very popular and coverage is produced by NHK and many commercial broadcasting companies. It's necessary to enable real-time video transmission from moving vehicles using mobile wireless links. However, current marathon broadcasting is implemented with only 2K HDTV.

Changing from 2K to 8K is demanding as a very high bit rate is required for transmission of 8K UHD TV. 8K satellite broadcasting at 85 Mbit/s uses 3.5 times the bit rate of 2K and for ENG (Electronic News Gathering) applications an even higher bit rate is required. In Japan the frequency allocation is limited for broadcaster mobile wireless links, with only 1.2 and 2.3 GHz bands available. This factor has to be taken into account seriously, as the frequency bandwidth available for 1 video channel is 18 MHz. Requirements for 8K mobile wireless link systems keep 18 MHz channel spacing, the same as for 2K signal transmissions.

Technology for Implementing 8K Mobile Wireless Link uses adaptive transmission-controlled MIMO technique for large-capacity transmission. The technique consists of 4x4 Singular Value Decomposition MIMO which optimises the propagation path generated by multiple antennas. Added to this technique are adaptive bit and power allocation, together with Time Division Duplex which provides feedback without additional bandwidth. Additional techniques are rate matching technology for uninterrupted video transmission, which adapts error correction coding rate control in accordance with channel conditions and adaptive video bit rate control, that adjusts the video bit rate to the rate-matched coding rate. The combined techniques achieve more than 145 Mbit/s transmission capacity for uninterrupted video transmission.

An alternative method of broadcast content distribution is FeMBMS (Further evolved Multimedia Broadcast Multicast Service) using Point to Multi Point (P2M) in 5G networks. FeMBMS can offload linear TV and scheduled broadcast content, saving on air interface spectrum and transmission network resources. When configured in broadcast mode, up to 60% of carrier resources can be allocated in eMBMS and up to 100% in FeMBMS. Increase of the guard interval up to 200µs is needed and broadcast services may be shared amongst multiple mobile network operators using High tower High power (HTHP) Transmitters. Combining broadcast (DVB-T2 HPHT) and broadband LTE (LPLT) networks allows HPHT TV to a mass audience (P2MP) whereas LPLT (Low Power low tower) satisfies individual request for content (P2P).



Dr Peter Siebert, DVB, Simon Tsang & Colin Prior ENENSYS, Andreas Streit, LS Telcom, Fumiki Uzawa, NHK, Jae Kwon LEE, KBS-Korea, and Dr Les Sabel, WorldDAB

Advances in Digital Radio and TV Technologies

Moderated by Bernie O'Neil, WorldDAB, the panelists were Taeko Hattari, NHK-Japan, Dr Kong Bin, NRTA-China, Jun Ho CHO, KBS-Korea, Sota Kobayashi, Ikegami, Rezvaneh Sahba, IRIB-Iran, and Alexander Zink, Fraunhofer IIS. On 1 Dec. 2018, Japan officially launched UHDTV (8K/4K) channel with two satellite broadcasting services capable of send 22.2 multi-channel audio. The services at UHDTV resolution provide sports, orchestra and documentary programmes, which are able to be received by LCD/LED Display units purchased at reasonable cost from home electronics stores.

NHK has the world's first 8K live production studio which is usually used for sports programmes to receive signal from OB vans. IP technology is utilised in studio core system with Video-over-IP and audio-over-IP. All signal paths are duplicated to make provision for redundancy or back up and can produce 22.2 multi-channel audio and 5.1 channel audio. The design of the audio system enables quick switching and with a backup MAD1 line for live broadcasting. The design caters for both 22.2ch and 5.1ch audio system, and 30 loudspeakers have been placed in the studio for this dual purpose. The 22.2ch programme signals are fed from 22.2ch audio mastering studio or 22.2ch OB van. The function of this studio is to add some comments, music, and sound effects in order to make the final programme mix.

The performance requirements for the new generation of 4K Master Monitor are more stringent compared to HDTV. The 3 major changes in performance are that 4K UHDTV need to have better resolution, higher dynamic range and better colour conforming to BT2020 international standard. HDR is more realistic and closer to what we see in real life, providing video with a wider range of luminance. Thus, a HDR Master Monitor should output more than 1,000cd/m² for peak luminance, by utilising brighter backlight and powering circuitry. It must contain an LCD specifically designed to reduce backlight leakage and have good contrast ratio. Uniformity in terms of luminance and chromaticity are also necessary. HDR monitor for 2K systems are also available to show HDR videos.

The Digital Radio Mondiale Emergency Warning Functionality (EWF) can save lives by its integration with the national warning infrastructure. In the case of pending or current

disasters, EWF must inform the public with maximum reach and as quickly as possible whilst carrying all relevant information. All DRM sets have EWF as default feature and can receive alarm signals, automatically retune to stations and have automatic receiver switch-on. EWF Implementation requires a government decision to include DRM radio into the national emergency warning network. Identification of the coordinating agency is needed as well as choice of languages used for alerts. EWF implementation also requires firm communication to receiver industry for mandatory incorporation of DRM EWF features.



Alexander Zink, Fraunhofer IIS, Dr Kong Bin, NRTA-China, Bernie O'Neil, WorldDAB, Jun Ho CHO, KBS-Korea, Sota Kobayashi, Ikegami, and Rezvaneh Sahba, IRIB-Iran

Immersive Technologies And Industry Trends in VR, AR, MR & 360 Video

The Moderator was Peter Bruce, IABM, and the panelists were Atsunori Toyoda, NHK, Toni Fiedler, Fraunhofer IIS, Jong Min Kim, VR, and Dr Mohieddin Moradi, IRIB-Iran.

A lot of programmes in recent years have been using computer graphics and virtual reality. However, the equipment is very expensive and the station has to find space for the green and blue backdrops. A recent advancement was made by NHK with the development of a real-time virtual studio with no chroma keying. The system does not require chroma key green or blue backdrops and can cope with people making gestures.

The key features of this system are that the boundaries can be touched up, to generate good masking. The subject can be separated from any distance with the depth sensor, whilst its viewpoints are converted into a TV camera viewpoint. The skeletal tracker allows for computer graphics following a person's movements. Lastly, the system is easy to operate with its simple graphical user interface. The results are that background separation and compositing, without the need for chroma keying, is available for the first time.

This new technology uses Left and Right Infrared (IR) Cameras to measure depth from the backscreen. The depth can be adjusted to lift out the things in the foreground, causing an image to be separated from the background. The TV camera itself obtains a colour image, while the IR depth sensor obtains a depth image. Both images are combined and the boundaries touched up to make them smoother. This in turn generates a key signal, separating just the person. The novelty of the system is that it can be used indoors or outdoors without chroma keying and

can produce virtual reality in existing studios. There is no limit on what colours a person can wear and it will cope with a person making gestures.

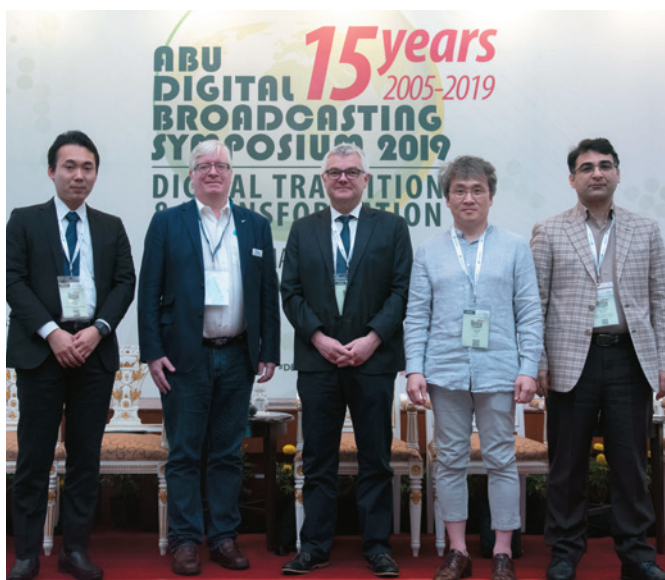
Versatile Video Coding is slated to be the next generation of video compression technique for UHD TV, HDR and 360 video. Versatile Video Coding (VVC) is being developed for finalisation around 2020 by the Joint Video Exploration Team (JVET), a united video expert team of the MPEG consortium and the ITU. It will be the successor to High Efficiency Video Coding (HEVC also known as ITU H.265). The standardisation process for the HEVC successor officially began in October 2017.

The new algorithms have 30-50% better compression rate for the same perceptual quality, with support for lossless compression. VVC can also support YCbCr configurations of 4:4:4, 4:2:2 and 4:2:0 with 10 to 16 bits per component, BT 2100 wide colour gamut and HDR of more than 16 stops (with peak brightness of 1000, 4000 and 10000 nits), variable frame rates up to 120 Hz, scalable video coding for temporal (frame rate) and spatial (resolution). This new standard is expected to have encoding complexity that is 10 times that of HEVC.

The advantages of render ahead workflow in the Cloud are that it renders “chunks” based on the events in the playlist into the desired delivery format by ‘render-nodes’. These chunks are then played out by a ‘payout-node’. Separating rendering and real-time playback of these chunks massively optimises resource utilisation by allowing all the heavy rendering to be compressed in the time domain, releasing the render resources when no longer required. Render-ahead fits into playout operations, as it allows for greater decoupling of upstream operations from the playout. Render-ahead workflow builds on cloud security as rendered segments are held in an encrypted form at rest and can only be decrypted by playout nodes for transmission. It is impossible to directly access assets through any, user as authentication is needed.

Hybrid broadcast broadband TV (HbbTV) is a global initiative aimed at harmonising the broadcast and the broadband delivery of entertainment services to consumers through connected TVs, set-top boxes and multiscreen devices. Among the technological advantages of HbbTV are that it enriches Broadcast Services with Datacast and OTT Internet. It enables personalised and targeted ads on TVs, as well as create branded TV viewing experiences with Operator Applications (OpApps) in Smart TV and STB.

Another type of content can be exploited is by leveraging weather for broadcast and online viewership. There is a case for more weather events as the destructive power of typhoons in the NW Pacific has increased by 50% in the last 40 years. The average precipitation from storm events has increased by 20 to 40% in the last 40 years. There has been improving accuracy and lead-time of warnings and forecasts. The public need to be informed and warned and the primary concern for severe weather forecasting is not forecast accuracy, it is the timely communication of warnings. Broadcast media have a pivotal role in communicating this critical information. Cost effective weather programming has wide appeal with highly sponsorship value and has low cost of production. Broadcasters have an essential role in communication of weather warnings. Due to its real-time nature and their high engagement, broadcasters can leverage weather using quality data and compelling graphics.



Atsunori Toyoda, NHK, Peter Bruce, IABM, Toni Fiedler, Fraunhofer IIS, Jong Min Kim, VR, and Dr Mohieddin Moradi, IRIB-Iran.

OTT, IBB and Content Networks

The session was moderated by Dr Ahmad Zaki Mohd Salleh, Media Prima, and the panelists were Oliver Linow, Deutsche Welle, Mika Kanerva, Sofia Digital, James Taylor, Ideal Systems, Tom Sutherland, Metraweather, and Yoshimitsu Tsurimaki, NTT Data Institute of Management Consulting.

The limitations of 2nd Gen playout in the cloud are that real-time or ‘just in time’ systems place a number of constraints on a system. Servers must be able to handle peak real-time load, often requiring expensive dedicated GPU instances to guarantee deterministic performance. Errors due to mistakes in playlists or assets can often only be detected during the event itself, limiting the ability for OPs to correct an error. Playout Operations had always been restricted to be reactive in their problem solving, this makes 24/7 real-time ops expensive



Dr Ahmad Zaki Mohd Salleh, Media Prima, Oliver Linow, Deutsche Welle, Tom Sutherland, MetraWeather, James Taylor, Ideal Systems, Yoshimitsu Tsurimaki, NTT Data and Mika Kanerva, Sofia Digital

Digital Transitions and Analogue Switch Off – Challenges, Case Studies and Experiences

The Moderator was Alex Reza Shariman Othman, RTM-Malaysia, and the panelists were Helge Stephansen, Nevia, Ilham Ghazi, ITU, Bernie O'Neil, WorldDAB, and Yogendra Pal, DRM Chapter India. India has a population of 1.3 billion and coverage by public broadcasting is from 138 MW Transmitters, 48 SW Transmitters & 489 FM Transmitters, making up a total of 675 Transmitters. Private FM Broadcasters are also operating with 330 Stations having a coverage of about 40%.

All India Radio (AIR) FM Services provide 52% of population coverage whilst the private FM cover 40% (mostly overlapping). 98.4% of population is covered by AIR MW Coverage and it must be emphasised that about 50% population of country depends only on MW coverage. India also broadcasts internationally by transmitting on AM/SW Radio to practically every part of the world.

However, there are concerns for analogue MW & SW because of poor quality signals, only one service per transmitter and no Value-Added Services. FM provides better quality than AM but has limited RF spectrum, single service per frequency, no value-added services and huge capital investment is required. Both AM and FM are obsolete technology, inefficient in terms of spectrum and energy hungry.

Digital systems must allow easy migration by re-using existing frequency spectrum and utilising existing technical infrastructure consisting of transmitters, feeder lines and towers. The new system should be capable of simulcast operation (analogue as well as digital) until listeners procure digital receivers. Digital must be non-proprietary and work in all broadcast bands i.e. SW, MW and FM.

India has one of the largest digital radio deployments comprising of 39 DRM Transmitters with 35 transmitters operating in the MW band and 4 Tx operating in the SW band. Over 3 billion rupees have been invested and 0.6 billion people have been covered, with a power consumption of 8 MW. In addition, AIR has carried out trials on Emergency Warning Functionality as certain areas of India are prone to natural disasters.

The lessons learnt by AIR on the Digital Rollout are manifold and are felt by the stakeholders. Broadcasters (public & private), Government (ministries, regulator, etc.), manufacturers (chipsets, desktop, automotive, mobile) and retailers must have close cooperation and coordination. The launch date for public market must be announced after all technical preparation has been completed. The radio content must be ready and inexpensive receivers available. The relevant authorities must convey clear and consistent information to public about Digital Switch Over (DSO).



Alex Reza Shariman Othman, RTM-Malaysia, Dr Helge Stephansen, Nevia, Ilham Ghazi, ITU, Yogendra Pal, DRM Chapter India, and Bernie O'Neil, WorldDAB

ANNOUNCING THE NEXT

ABU DIGITAL BROADCASTING SYMPOSIUM 2020

2-5 MARCH 2020, KUALA LUMPUR

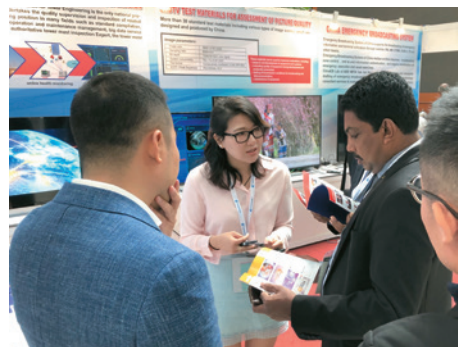
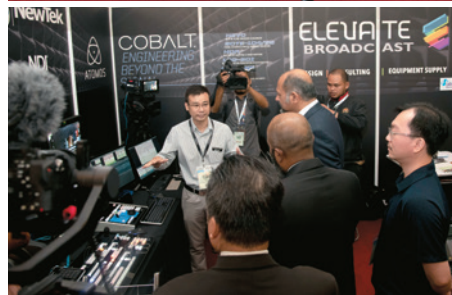
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For more information, contact db@abu.org.my
db.abu.org.my

DBS Exhibition

The DBS Exhibition was held on 5-7 March and played host to 41 exhibitors, some of whom invited partner companies to exhibit alongside them at their booths, bringing to 60 the total number of companies represented.

The DBS exhibition this year showcased VR headgear, antennas, digital cameras, mixer and frequency & coverage planning software among others.

Integriti Padu Sdn Bhd won the 2019 DBS Best Booth Award. Mr Hamid D Nayeri, the ABU Technical Committee Chairman from IRIB-Iran, presented the award to Ms Mardhiah Nasir, Vice President of Sales, Integriti Padu Sdn Bhd.



Industry Debate:

Broadcasters and the Connected Generation

– Content Ideas, Business Cases and Serving a Global Audience

Panelists: Hong, Young Kyung, KBS-Korea, Oliver Linow, Deutsche Welle, Abdul Muis Shefii, Radio Television Malaysia, Peh Beng Yeow, Mediacorp-Singapore, Lindsay Cornell, BBC-UK, Ruxandra Obreja, DRM.



Abdul Muis Shefii,
Radio Television
Malaysia



Mr Akira Negishi,
NHK-Japan

The Moderator, Mr Akira Negishi of NHK-Japan, started the debate by stating that the audience wants to get engaged by being connected with the station. The younger generation prefers interactivity, challenging the broadcast stations to stay relevant in a rapidly changing world. The population between the age group of 10 to 30 tends to access the internet more than staying tuned to linear TV. Besides that, studies have shown that 70 % of them get news via the internet.



Hong, Young Kyung,
KBS-Korea



Ruxandra Obreja,
DRM

Everyone has a smartphone, demands instant access to information and wants to know the gist of everything going on. In Singapore, Toggle, which is the local OTT entertainment provider, allows users of the new Apple TV to access locally-produced content from Toggle. This latest foray marks the aggressive expansion of Toggle over the years, to be available on different platforms and screen sizes – starting with an online entertainment portal to an app on smartphones and tablets that allows for livestreaming and catch-up TV services. Multiplatform usage has spread to the younger generation with each owning a phone. There is

now more competition for the eyeballs and ears.

Being tech savvy, consumers want more control and want to share information. Viewing patterns have changed, with users preferring small clips of video instead of long programmes. The viewing locations have changed from the house to the office and while taking public transport or walking. Even when the TV in the house is switched on, the phone that is by the user's side is also switched on

New platforms have emerged, as old ones are not working efficiently. There are lots of content but not all can be seen as there is limited time. Hence, it is a wise move to put the additional content on social media such as Facebook, YouTube and Twitter. It is also best to customise content for advertisements and create content that enables consumer engagement. The media landscape is rapidly changing with the mega trend of migrating to digital platforms. There is a changing pattern of content consumption, with people binge-watching and using “snack culture”: the trend of consuming entertainment or other media in brief periods.

Watching regular TV is declining with a corresponding rise in enjoying content via Smartphone. The result is that there is a reduction of the total size of TV ads market for traditional media. Hence, the three major broadcasters in Korea started POOQ as a joint service. POOQ is a Korean broadcasters' OTT platform and supports N screen service – transmission to smartphone, personal computer, tablet or regular TV.



Peh Beng Yeow,
Mediacorp-Singapore



Lindsay Cornell,
BBC-UK



Oliver Linow,
Deutsche Welle

DVB Workshop: Best Video and Audio Combined with More Interactivity – The New DTT



Dr Peter Siebert, DVB

With hybrid services, OTT and online distribution growing in importance, DVB is applying its expertise and know-how in this all-important domain by introducing DVB-Internet. DVB-I will complement the current DVB standards, that form the basis of the way consumers watch TV today. DVB-I is expected to provide internet TV enablers for the highest quality DVB TV experiences, from traditional big screen TVs to non-traditional devices such as phones, tablets, and laptops.

Self-interference in SFN can be resolved in many ways, such as increasing the guard interval; this however, causes loss of capacity. A more robust system configuration can be utilised, such as lower constellation mode of 64 QAM or by reducing the antenna height of the most distant transmitter. Other methods use antenna tilt and directional antennas, adding artificial delay to the nearest transmitter and installing more low power, low tower (LPLT) transmitters.

DVB-T2 is designed with a powerful Forward Error Correction (FEC) subsystem which combats effects from interference. It is necessary to understand the Modulation Error Ratio (MER) parameter, which determines the amount of margin left before a crash occurs. RF impairments can occur from impedance mismatching in the distribution network at high rise building, impulse noise from electrical motors and propagation conditions.



Jerry Gui, Dolby

Another impairment that needs to be taken into account is the stratification effect, which originates from the antenna height. By varying the antenna height, the signal strength changes significantly, with impact on the Bit Error Ratio (BER) and MER. These different behaviours are due to the different location of the transmitter and the orography of the territory. With the use of proper diagnostic tools, the shape of the signal spectrum can be analysed and steps taken to avoid wave ripples that are too deep. The choice of the antenna and its positioning are crucial, because they determine the quality of the entire system.



Mats Ek, PROGIRA



Colin Prior, Enensys



Simon Tsang, TestTree



Gino Salocchi, Rover



Dr Leon Mun WY, Sony



Mika Kanerva, Sofia Digital

A large part of terrestrial TV network costs is related to transmitter sites and comprise infrastructure, transmitters and antennas. It is possible to optimise coverage, and hence reduce costs by switching over to DVB-T2, as there would be a lower number of fill-in sites required, compared with analogue TV. In Sweden, the number of fill-in sites was reduced from about 650 to 500. Single frequency networks (SFNs) require careful planning in order to avoid network problems, including self-interference. A well specified network can reduce uncertainty for the equipment manufacturers and thus the price of equipment.



WorldDAB Workshop: DAB+ -Understanding the Business Case



Joan Warner,
WorldDAB

Grant Blackley,
SCA

Bernie O'Neill,
WorldDAB

It is already well known fact that DAB is 10x more cost effective than FM and that IP streaming is not an economic replacement to DAB broadcast. Current European analysis shows that 10% of traffic via IP costs similar to 100% traffic by DAB+ . DAB+ costs less to operate than Full-IP streaming which is in turn less than FM. DAB+ and IP are complementary, thus making Hybrid DAB-IP as the most cost effective multimedia delivery combination.



Cath Dwyer, ABC-
Australia

A study on using 4G for streaming radio delivery uncovered multiple issues including poor coverage in many rural areas, and high impact of video streaming on cell congestion. The different streaming apps had different responses to loss of coverage, congestion and errors, resulting in audio dropouts. Congestion occurs frequently in densely populated areas mainly during traffic jams and at high density urban areas. It can be concluded that streaming over 4G is not reliable.



Orasri Srirasa,
NBTC

5G has some really good new capabilities, but still comes up short when compared to broadcasting. 5G is an evolution from 4G, with new technologies gradually being rolled into the existing LTE/4G mobile ecosystem in order to provide improvements, by increasing speed, lower latency and improved reliability. 5G provides improved solutions for massive machine communications for Internet of Things (IoT). It is said to be ultra-reliable, with low latency for IoT. However, all extensions and capabilities are not available at the same time.



Nick Piggott, RadioDNS, and Aaron Alphonso, Macquarie Media

5G retains the basic spectral efficiency of current 4G, with high connection speeds made possible by using more spectrum and carrier aggregation (CA). The highest speeds require, the use of the 3.6 GHz frequency band and the millimetre Wave (mmW) frequency band of 26/39 GHz. The implications on spectrum are that there is significant distance loss impact at high frequencies and long distances. 26/39 GHz is limited to micro/pico cells with maximum range of 0.5 km while 3.6 GHz micro cells have a range up to a few km. Therefore sub 1 GHz band is still needed for macro cells and wide area coverage.

There will be discussions on the acquisition of sub-700 MHz spectrum in the World Radio Conference 2019 – WRC19. Existing mobile frequency operating bands are listed from 450 MHz and higher. Now, the implication is that there will be further compression of terrestrial DTV into UHF band. Compression of UHF bands threatens the ability of DTV to both increase content offerings and video resolution. The loss of spectrum for terrestrial DTV has the potential to threaten the capacity available for DAB+ in VHF Band III.



Do Anh Duc, VOV

Lindsay Cornell, BBC

Steve Ahern, AMT

Report on DBS by Jeewa Vengadasalam, Specialist II, Department of Electrical & Electronic Engineering, Lee Kok Chiang, Faculty of Engineering & Sciences, University Tunku Abdul Rahman, Malaysia



DBS Workshops

DOLBY

Mr Geoffrey Low, Staff Content Engineer, Dolby, covered the topic Simple Surround Sound Production for Enhancing the Immersive Experience.



Geoffrey Low

Dalet

Mr Laurent Jardin, Project Manager/Solution Architect, Dalet Digital Media Systems, covered the topic Orchestrated Media Solutions – Innovative Media Asset Management and AI Enable News Operations.



Laurent Jardin

DRM

Mr Yogendra Pal, Honorary Chairman of the DRM Chapter in India, presented Introducing the DRM benefits and Services to Millions – the India Case.



Yogendra Pal

Mr Alexander Zink, Senior Business Development Manager, Fraunhofer ISS, Germany and Senior Consortium Member, covered the topic How to Transition from Analogue to Digital Radio – Get the Practical DRM Know-how and Experience.

NTT Data Institute of Management Consulting Inc

Mr Yoshimitsu Tsurimaki, Senior Manager/Social System Innovation, NTT Data Institute of Management Consulting, Inc, presented on Hybrid Technical Update.



Whiteways Systems

Mr A Raza, Director and Mr Yashovardhan Sharma, Senior Manager Sales, of Whiteways Systems covered Modern OB Van Design Concept.

Rohde & Schwarz

Mr Stephen Wong, Regional Sales Manager, India & South East Asia, Rohde & Schwarz Singapore, presented Video Over IP: Optimizing IT Technology in Broadcast.



Stephen Wong



Ong Kah Keong

Mr Ong Kah Keong, Solution Architect, Broadcast and Media (Asia-Pacific), Rohde & Schwarz, Singapore, covered HPC, Leading to Smart Storage.



Yashovardhan Sharma



A Raza



3D Audio Demos at DBS by Fraunhofer IIS

“Welcome to the new world of 3D Audio for Television!”, was the theme of the special 3D Audio demonstrations that ran among the DBS Masterclasses. The demo sessions organised by Fraunhofer IIS used their 3D soundbar used in a private living room setup with a 65” TV set. Visitors to the demo were able to experience next generation TV broadcasting audio solutions that incorporate MPEG-H technology providing an immersive audio experience just using a soundbar.

The MPEG-H TV Audio System introduces 3D immersive audio based on a 7.1 plus 4 height speaker set-up and, object coding that allows for user interaction, multi-lingual programming and sophisticated sound effects. The system covers to complete signal chain from program production

Mr Kurt Ji Zou, Technical Manager
Fraunhofer IIS, China,
Conducting the demo



over distribution networks to the consumer home. The 3D immersive soundbar reference hardware design is equipped with a MPEG-H decoder and Fraunhofer UPHEAR technology (immersive audio virtualization algorithms). It proves that it is possible to recreate immersive 3D sound through a relatively simple and easy to install speaker in the living room.

The demos sessions were conducted by Mr Kurt Ji Zou, Technical Manager, Fraunhofer IIS, China.

DBS Immersive VR Showcase Offers Delegates a Real Treat in 8K

The ABU teamed up with HTC Vive Malaysia and Funique VR Studio to present a unique immersive experience showcasing state-of-the-art content creation in the Virtual Reality (VR) domain at DBS 2019. The core mission of this immersive experience was to showcase VR as a true form of art to bring an unparalleled experience of storytelling and content creation. In total, eight showcase sessions were delivered over three days from 5 to 7 March 2019.



Ellen Kuo, Funique VR

Thanks to HTC Vive Malaysia, participants were able to experience the latest 8K high quality VR content with the latest headsets from HTC Vive. Each session lasted about 50 minutes, showcasing a selection of VR experiences chosen by Funique VR Studio which is dedicated to realising 8K per eye Stereoscopic VR in the film industry and creating a new generation platform for viewers. Participants also explored how each of the VR content was created, what makes them unique and why they are successful. More than 70 participants joined the immersive VR experience at DBS this year.

The highlights from the VR showcase included an award-winning, live-action comedy titled *Your Spiritual Temple Sucks* directed by John Hsu, which explores the full cinematic potential of virtual reality in storytelling. Another VR film showcased was an 11-minute VR short film titled *Eyes in the Red Wind* directed by South Korean VR filmmaker Lee Seung-moo. *Eyes of the Red Wind* tells the story of a family that holds a ritual with a shaman to help the soul of a deceased man who was drowned.



Aaron Lim, HTC and Kevin Yu, Funique VR

The showcase also offered a series of episodes from Funique VR Studio's Insect Channel featuring some fascinating creatures that one participant described as "feels being immersed in the National Geographic channel."

This marks the second year that ABU has organised a VR showcase at DBS. Last year for the first time, DBS delegates were treated to an immersive VR experience from World VR Forum (WVRF), an international organisation dedicated to advancing the virtual reality industry.

MoJo Masterclass at DBS a Major Hit



Viasen Soobramoney

Multiple award-winning South African journalist and trainer Viasen Soobramoney took DBS 2019 by storm as he conducted a Mobile Journalism (MoJo) masterclass series, a first-of-its-kind organised at the ABU Digital Broadcasting Symposium.

He delivered it over the course of DBS as three individual sessions. Participants in each masterclass were taught how to

create professional videos and engaging digital content with their smartphone with the ultimate goal to help them transform the communication workflow of their newsrooms. More than 100 participants took part and benefitted from the three masterclass sessions conducted from 4-7 March 2019 at Royale Chulan Hotel.

"The sessions were tailored to give participants insight into the latest trends regarding mobile journalism. The highlight of the course was the practical nature of the sessions that saw all participants going out and trying the new techniques they had learnt. The engagement was high and very encouraging. Wish the sessions could have been longer!" said Viasen.

The four modules covered Mojo Photography, Mojo Radio, Mojo Video, and Mojo Playbook. Participants learned how to maximize their smartphone's potential when capturing images with tips and tricks and basic smartphone photography principles. They also learned the art of audio broadcast using their smartphones and how to capture audio and the fundamentals of radio storytelling on smartphone.

In addition, participants tried their hands at shooting, editing and packaging broadcast quality video using their smartphones. The biggest attraction of the masterclass was the ultimate guide to tools, apps, tips and tricks to creating content on smartphone shared by the trainer. Participants were delighted to walk away with some quick basic knowledge on mobile journalism that they could apply in their daily work routines.

Based in Cape Town, South Africa, Viasen specialises in the areas of digital convergence and multimedia strategy. He is the founder of Africa's first Mobile Journalism newsroom and a vastly experienced media trainer.

Masterclass on use of Drones in Professional Video Production



Ming Tse Lin, Fire Phoenix Creative

One of the most interesting masterclasses that the participants looked forward for at the Digital Broadcasting Symposium was the masterclass on using Drones for video coverage. With the theme “Send in the Drones”, these sessions presented the basics of using drones for different kinds of production applications. It also looked at the current drone market space, which is a fast-evolving industry segment, with different kinds and types of drones available at different prices for different kinds of applications. Features and functions of

different types of drones were explained with the kind of technologies available in today’s drones. The session provided a guide on how to select the most appropriate drone for different production projects.

The masterclass also covered drone handling techniques, including how to proceed in critical and emergency situations. Modern drones are well equipped with 4K cameras and built-in collision avoidance systems, obstacle detection sensors to scan the surroundings, wide coverage range and multiple sensors to track a target object and help fly and guide the drone. The sessions also addressed its applications in video and broadcast production including the use of latest 360° video capture devices. Few models of state-of-the-art drones were used to showcase and demonstrate expert techniques. Professional tips and tricks were shared with the participants who had a chance to try to fly a drone themselves. The main point of the masterclass was that, like any other equipment, drones can be used to tell compelling stories. Some stunning footage were also shown on the monitor as examples.

The masterclass was presented by Mr Ming Tse Lin, an experienced cameraman, videographer and drone operator and was supported by Green Speed Pictures.



Masterclass on Modern Broadcast Camera Techniques, Set-up and Operation



Dr Mohieddin Moradi, IRIB-Iran

The Digital Broadcasting Symposium this year featured an engaging masterclass on Modern Broadcast Camera Techniques, Set-up and Operation. The masterclass covered wide range of topics related to today's broadcast quality cameras including how the image sensors work to produce high-quality pictures in HD, 4K and 8K, how technologies like High Dynamic Range (HDR) and Wide Colour Gamut (WCG) is utilised and how to use the camera for optimum output in various cases. The sessions utilised the state-of-the-art 4K camera and professional monitor provided by Ikegami (model: UHK-430) to demonstrate these technologies, techniques and operations. Having the camera and monitor available made it easy for the participants to appreciate and see the different aspects of these technologies.

The half-day sessions covered all relevant topics when it comes to high quality image capture and representation. It introduced the various elements of quality we perceive for example; HD/UHD which relates to the resolution of the image, Dynamic Range (HDR/SDR) which relates to how well colour is represented, Wide Colour Gamut (WCG) which relates to the extent of colours represented, High Frame Rate (HFR) which effects the smoothness of a moving picture, and then the coding methods and compression which together defines the end quality of the digital signal. These elements collectively address the quality of experience.

Each of these elements was explained in detail starting with the difference in resolution and picture size comparing SD to HD and the two UHD standards 4K and 8K. Where 4K has 4-times for picture details and 8K has 16-times more compared to HD. HDR which is part of the UHD standard providing a more realistic colour variation compared to Standard

Dynamic Range (SDR) which has been part of the SD and HD era. HDR can present a much wider colour range when it comes to shadows, highlights and contrast in an image compared to SDR. The Wider Colour Gamut on the other hand increases the colour representation with a more wider colour space compared to what the industry has been using before. In short it allows to include more of every colour allowing more deeper colours, like more of red, green, blue and other colours, hence the pictures are more vivid and closer to what is perceived by the human eye. It was also explained how High Frame Rate (HFR) will help in creating a much smoother experience for the viewers in reducing motion blur and jitter specially when it comes to fast moving images like in sports applications. All of these combined provides a more realistic and immersive viewing experience but it also requires more storage and higher bandwidths to store and distribute these pictures as it contains a lot more data compared to SD and HD. Hence the need for better compression systems and higher bitrates to retain the quality of the video and the experience.

The sessions also covered various aspects of camera operation specially when it comes to today's 4K cameras which has the ability of capturing highest quality pictures incorporating the above mentioned qualities but at the same time can also be used to capture regular HD pictures with the ability to downgrade them further to SD at the output. This makes these cameras to be more future proof allowing them to be used for current HD production applications, while at the same time through the available multiple levels of settings can also capture the highest quality 4K pictures with HDR and HFR features. These settings and techniques were extensively demonstrated using the available Ikegami camera, including how to setup the camera for different types of lighting and other environmental conditions for optimum performance.

The masterclass was presented by Dr Mohieddin Moradi, a Video Engineer in the Research Wing of Islamic Republic of Iran Broadcasting (IRIB) who is also a lecturer at the IRIB University. He was assisted by Mr Mitsunori Yoshino, an Engineer from Ikegami, who helped with the demonstrations and operations using the Ikegami UHK-430 camera and the 4K monitor.



Thank you Radio Televisyen Malaysia

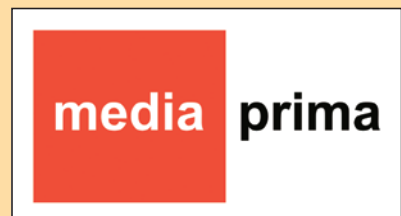


Thank you Media Prima



The ABU would like to extend our sincere gratitude and appreciation for all of the hard work and dedication provided by the AV team from Media Prima throughout the years in delivering top-notch coverage for the conference.

Special thanks go to Dr Ahmad Zaki Mohd Salleh, Group General Manager, for his continued support to the event.



ABU Technical Bureau Mid-Year Meeting

8 March 2019, Kuala Lumpur



Mr Hamid D
Nayeri, IRIB-Iran



Kenichi Murayama,
NHK-Japan

The mid-year meeting of the ABU Technical Bureau took place in Kuala Lumpur on 8 March, a day after the 2019 ABU Digital Broadcasting Symposium.

The bureau reviewed the symposium and heard the progress its members are making in the transition to digital broadcasting.

The meeting was chaired by its new Chairman, Mr Hamid D Nayeri of IRIB-Iran. He succeeded Mr Masakazu Iwaki of NHK-Japan.

The bureau also discussed the progress reports from the chairmen of its study projects in the areas of production, transmission and spectrum, and agreed on a new selection criteria for the ABU Technical Review Prizes, which are announced annually.



Peh Beng Yeow,
Mediacorp-
Singapore



Lasantha
Samaranyake,
EAP-Sri Lanka



Pongsaratch
Rachatavekin, NBT-
Thailand



Akira Negishi,
NHK-Japan



Dr Kong Bin,
RTPRC-China



Mr Manoj Gupta,
DD-India

It saw a high turnout, with bureau members present from RTPRC-China, NHK-Japan, KBS-Korea, DDI-India, RTM-Malaysia, Mediacorp-Singapore, NBT-Thailand, TRT-Turkey, EAP-Sri Lanka, MTV-Sri Lanka and VTV-Vietnam.

Members also gave updates on new projects, future plans and some of the challenges they are facing. Among other issues, the bureau discussed a recommendation on Ku-band satellite issues related to ITU WRC-19.

Members agreed to set up a study project on satellite broadcasting systems, digital radio technologies and to restructure the Training and Services Study Topic Area.



Tharaka
Mohotty, MTV-
Sri Lanka



Kazim Pektas,
TRT-Turkey



Gül Tuğba
YILDIZ,
TRT-Turkey



Augustine
HONG,
KBS-Korea



Masashi Kamei,
NHK-Japan



Jamel Seman,
RTM-Malaysia



Tue Nguyen, VTV-
Vietnam

They also discussed arrangements for the Technical Bureau and Technical Committee meetings alongside the ABU General Assembly in Tokyo in November 2019. The Technical Bureau meeting takes place on 17 November and the Technical Committee meeting on 18-19 November.

