

tech



Time for T2 in Germany

Plus

- **MAKING DATA PRIVACY
A PRIORITY**
- **WHAT'S IN 3GPP RELEASE 14?**
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Cover Story: March 2017 saw the launch of the DVB-T2 platform in Germany, delivering HD services enhanced with HbbTV (see page 10). Our cover photo shows Bayerischer Rundfunk's Munich-Freimann transmission tower, used for DAB+, DVB-T2 HD and LTE eMBMS trials by BR and IRT. (Photo: Ekkehard Winkler/IRT)

Editor-in-Chief: Simon Fell
 Managing Editor: Eoghan O'Sullivan
 Email: osullivan@ebu.ch
 Tel. +41 22 717 27 05

Design: Louise Tait
 Printed on FSC certified paper by New Goff n.v.

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I love it when a plan comes together!

Simon Fell, Director, EBU Technology & Innovation

As I write these words we're deep into the final stages of preparing the EBU Technology & Innovation workplan for the next two years. We will be asking the Technical Assembly to endorse this important document in Stuttgart on 8-9 June.

Preparing the workplan is both a challenging and a rewarding experience, as it gives us a chance to take stock of the work we're doing and examine how we can best serve you, our Members. While the process is led by the Technical Committee, we have also sought to involve our Technical Liaison Officers and those who are active in our working groups.

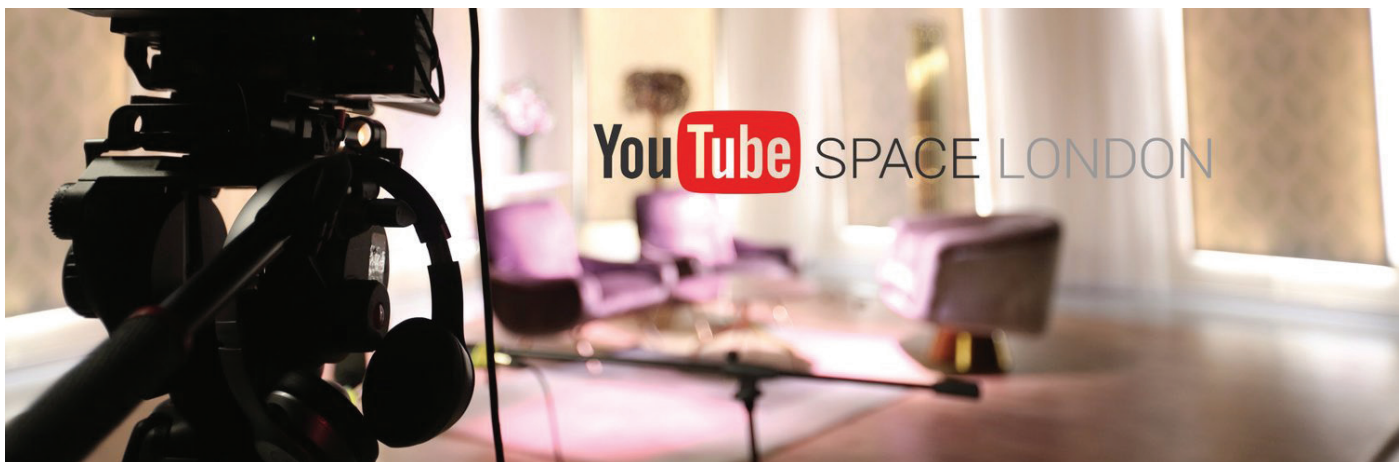
The aim has been to identify the trends in media technology that are of most relevance for our Members and subsequently define the focus areas for our activities. In a world of rapidly changing technologies, the digital transformation of our industry and the subsequent impact on public service media operations are uppermost in our minds.

While I urge you to consult the workplan itself on our website, I'd like to outline here the broad strokes. We've aligned our activities under six thematic areas:

- **User Experience:** here we address the need for increased personalization, the focus of our PEACH project, assist in the transition to UHD TV, and examine the value – or otherwise – of VR/AR/MR.
- **Distribution:** this covers everything from spectrum through to broadband/online delivery, the positioning of broadcaster requirements vis-à-vis upcoming 5G standards, and, of course, digital radio.



- **Multiplatform Production Workflows:** as we adapt to the multiplatform world, we need to study software for production and look at innovation in content creation and production technologies, as well as the new buildings in which PSM will operate.
 - **Data:** there are a range of metadata issues to be solved, along with data analytics and the use of big data in media; this also extends into areas such as artificial intelligence and machine learning, where we must keep pace with the leading global platforms.
 - **Cloud and IP Infrastructures:** new live IP infrastructure, remote production, use of cloud systems in production and distribution, and virtualization of today's studio hardware.
 - **Media Cyber Security:** we need to build on the recommendations we have already published, to look at cloud security and also work internationally with other groups, including through the World Broadcasting Unions, to encourage industry-wide adoption.
- The above will be set out in more detail in Stuttgart, where we will also have an opportunity to thank our Members, without whose valuable efforts we could not achieve all of this.
- Finally, if you want to have a little fun and are lucky enough to have access to an Amazon Echo, then you should try out a new tool we have developed based on the Eurovision Song Contest. You can now ask Alexa who won the contest in any given year and also hear the song in question. Something to keep you occupied until next year's contest! P.S. Well done Portugal!



NTS 2017 participants will find out how IP networks have been implemented by Google at YouTube Spaces.

Centre of the universe for IP-based production

LOOKING AHEAD TO THE EBU NETWORK TECHNOLOGY SEMINAR 2017.

For two days in June every year, Geneva becomes the centre of the universe for network technology in media production. The EBU Network Technology Seminar has been growing annually, to the point where last year's event was full to capacity, with 160 participants. The 2017 edition, on 20-21 June, looks set to match or even – if additional space can be found – beat that record.

The hot topic for NTS 2017 is likely to be SMPTE 2110. The standard, which will be at the heart of live and IP production for years to come, is expected to be ratified sometime this year. Many of those who are involved in drafting SMPTE ST 2110 will be present for NTS 2017, so it's a wonderful opportunity to gain early insights from the experts.

The centrepiece of the impressive

event programme is a panel session on Day 1 that will take a multilayered look at “The State of Live and IP Production”. An introductory presentation by BBC head of production architecture Mike Ellis will be followed by three discussions, each bringing a new set of experts to the podium. The discussions will move progressively down the IP production layers, from controlling the facility, to the devices, and finally to the network itself.

Another highlight of Day 1 will be a set of five use cases showing how a variety of leading media organizations are tackling the challenges of moving to IP in production. Swedish Radio will share their audio over IP experiences; there will be updates from BBC's Cardiff Central Square project and RTL City BCE in Luxembourg; and

presentations on how IP is used in Sky's master control room and for Google's YouTube Spaces facilities.

With a session on cloud and virtualization, a round table discussion on security issues, a set of demonstrations showcasing the latest in dematerialized broadcast functionalities, and a full morning of in-depth tutorials, it really is an unmissable event for media professionals working in this field. (EBU Members will be able to access videos of all NTS 2017 presentations a few days after the event finishes.) A Eurovision Academy Master Class on “Preparing your move to Live-IP TV Production” on the two days immediately following the Network Technology Seminar 2017 offers a chance to get even more value from the trip to Geneva.

tech.ebu.ch/nts2017



Farewell Félix

At the end of April 2017, we said goodbye to Félix Poulin, who has returned to his home country to take up the position of senior manager of new broadcast technologies at CBC/Radio-Canada in Montreal.

We wish him every success with this new challenge and thank him for all that he contributed to the team over the past six years, particularly in leading EBU Technology & Innovation work in the domain of networks and IP.

New to the team

THE FIRST HALF OF 2017 BROUGHT A NUMBER OF ADDITIONS TO THE EBU TECHNOLOGY & INNOVATION TEAM. OUR NEW EXPERT ON RADIO, BEN POOR, WAS INTRODUCED IN THE LAST ISSUE OF TECH-*i*; AND BELOW WE MEET THREE MORE NEW ARRIVALS.

THE SCRUM MASTER

Aurélie Boiteux comes to the EBU with a background in software engineering, which she studied in France. She has worked in the banking and telecoms industries in both France and Switzerland, serving as an agile software engineer, project manager and scrum master. It is in this last role that she joined the software team at EBU T&I.

Scrum is an agile framework for completing complex projects, used particularly in the software domain. The scrum master ensures that the methodology is well understood and correctly applied, to ensure maximum benefits for the team. She functions as a process owner, teacher, coach and facilitator.

Aurélie is working with our PEACH team to co-develop tools that will allow EBU Members to deliver personalized media services and experiences. (Read more about PEACH in issue 31 of *tech-i* and at tech.ebu.ch/personalization.)

THE RESEARCHER

Paola Sunna is always looking to the future. Her career so far has involved working on the boundaries of what is possible with media technology in a wide range of domains: from video coding and image quality to user interfaces, web technologies and immersive experiences. She studied Electronic Engineering at Turin Polytechnic and also received an MBA in 2005.

She began working at the RAI R&D centre in 1997. Over a 20 year period her work has brought her into contact with many EU R&D programmes as well as the DVB Project, MPEG and, of course, the EBU. Her work has been recognized with various awards and commendations, including



Patrick Wauthier, Paola Sunna and Aurélie Boiteux.

the Italian Prize for Innovation in Information Communication & Media Technology for an augmented reality application.

She started a new adventure at the EBU earlier this year, focusing on the cutting edge of immersive audio and video technologies, from content production to the end user experience.

THE COMMUNICATOR

Patrick Wauthier

Patrick Wauthier, responsible for publications and events at EBU T&I, has spent the past ten years working as a journalist and producer in radio

and television in several countries around the world. He began his working life as a sound engineer in the broadcast and music industries but was driven to swap seats by his belief in the importance of the fourth estate and his passion for radio.

The EBU has been a constant presence along the way: in the form of the AES/EBU standard in digital audio as a sound engineer; at Australia's SBS, which broadcasts the Eurovision Song Contest; or interfacing with the Eurovision News Exchange while at Euronews in France. Patrick joined the EBU in April 2017.

Metadata's most wanted

THE EBU'S ANNUAL GATHERING OF METADATA EXPERTS TAKES PLACE ON 27-29 JUNE.

The programme for the MDN (Metadata Developer Network) Workshop 2017 reads like a “most wanted” list of metadata-related topics: artificial intelligence, machine learning, content analysis, natural language processing, content enrichment, cognitive services, automated metadata extraction and more. The workshop is a must for anyone who deals with metadata in the context of media production and distribution.

The presentation slots at this two-and-a-half day event are each an hour long, which allows the speakers to present their topic in detail and leaves plenty of time for questions and discussion. It's an excellent forum in which to share experiences and explore new solutions.

The workshop is open both to EBU Members and non-members. There is no fee to attend, but registration is mandatory. tech.ebu.ch/mdn2017



EBU-TT now covers the complete workflow

The EBU-TT family of subtitling specifications was updated this May, *writes Frans de Jong*. The format now covers the complete chain from authoring to distribution, for both live and prepared subtitling.

Two of the specifications have advanced to v1.0 status. Part 2 (Tech 3360) provides strategies for converting existing EBU STL (Tech 3264) files into their modern EBU-TT counterparts. Thanks to its rich explanations, the document helps make informed choices about the best way to convert legacy subtitles. Special credit goes to John Birch (Screen Systems) for the extensive work done.

With Part 3, known as EBU-TT Live, subtitles can now be carried throughout production facilities as EBU-TT streams. The scope is not limited to live subtitling; prepared subtitling is also supported. EBU-TT Live offers a flexible collection of nodes with which to build subtitling processing chains. Think for example of one or more authoring stations that

send subtitle streams to a distribution encoder or an archive. The data carriage mechanism is not prescribed, but to help get started a WebSocket carriage specification is available (Tech 3370s1).

The EBU-TT Live work has benefited from extensive testing and implementation experience gained through the open source EBU-TT Live Toolkit project, to which especially the BBC has actively contributed. All of this builds on the core EBU-TT format specification (Tech 3350), which was updated in May as well. Changes include clarification on various topics and a more relaxed way to deal with metadata extensions. The EBU-TT metadata elements are now defined in a single, new document called EBU-TT Part M (Tech 3390). This makes it easier to keep an overview and avoid duplication. With all these parts and the existing EBU-TT-D spec for online distribution, subtitles are now truly supported 'glass to glass'. For more information see: tech.ebu.ch/ebu-tt

BroadThinking 2017 videos available

BroadThinking is the EBU's annual event looking at broadband media delivery, streaming technologies, front end design and user experience. The 2017 edition took place at the start of May (two months later than its usual slot of March, to which it will return in 2018) and delivered two days of excellent presentations and engaging discussions.

EBU Members can find PDFs and videos at: tech.ebu.ch/broadthinking2017



PSM and 3GPP: a new dream team or only part-time companions?

EBU MEMBERS HAVE SUCCESSFULLY ENGAGED WITH THE MOBILE TELECOMMUNICATION INDUSTRY TO ENSURE FUTURE 3GPP SPECIFICATIONS WILL BETTER MEET THE NEEDS OF BROADCASTERS. **ROLAND BEUTLER**¹, **JOCHEN MEZGER**² AND **ANDREW MURPHY**³ TELL THE STORY.

Even though Public Service Media (PSM) see mobile devices such as smartphones and tablets as user devices of growing importance, there has been very little engagement between the broadcasting and mobile telecommunication sectors around technology. This changed as recently as two years ago, when PSM became aware of an activity in 3GPP, the global standardization body for mobile telecommunication technology, which set out to enhance the specification to better accommodate television services in its forthcoming Release 14.

As this seemed to touch upon vital interests of PSM, they began to engage actively, with the EBU Strategic Programme “Future Distribution Strategies (FDS)” facilitating broadcaster involvement in 3GPP.

SPIRIT OF COOPERATION

For some time, the FDS group titled CTN-Mobile (Cooperative Terrestrial Networks) had brought together PSM and the mobile industry to discuss issues of common interest and allow both sides to develop a better understanding of each other's business, requirements and obligations. The spirit of cooperation within the group was key to getting the most out of the 3GPP process. Another FDS project, MTS (Mobile Technologies and Standards), was created to allow broadcasters to keep track of the detailed technical developments themselves.

The 3GPP initiative on television services over mobile networks called for the submission of service level requirements. This is where PSM had an opportunity to inject their particular requirements. Among



An IRT prototype build showing linear free-to-air television via LTE eMBMS with nonlinear (HbbTV) content.

others, these encompassed the need to deliver television services free-to-air and an option to cover large areas with a guaranteed quality of service, independent of the number of concurrent users. Furthermore, PSM requested the option of enabling the operation of standalone eMBMS (the broadcast/multicast mode of 3GPP) networks without the need to implement any unicast capability. This requirement is closely related to

the possibility of enabling receive-only devices.

3GPP is organized in three different strands which are differentiated according to whether issues relate to radio access, core network, or service and system architecture aspects. Clearly, any high-level service requirement will in one way or another impact all 3GPP areas. For example, while free-to-air access, receive-only devices

"If 5G is to suit the needs of PSM in the future we should not diminish our efforts to contribute actively to the 3GPP process."

and standalone eMBMS network operation have a direct bearing on the system architecture, the call for large area coverage affects the radio access technology.

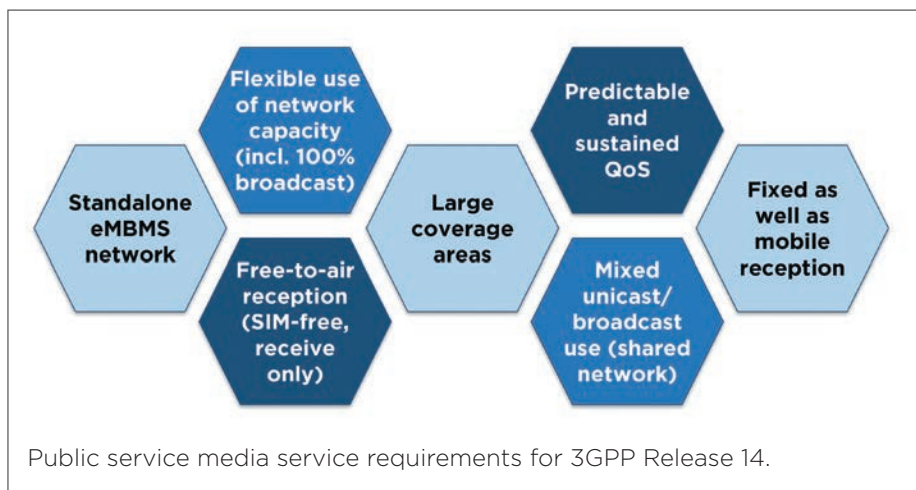
NETWORK TOPOLOGY

About every 18 months 3GPP publishes a new release of the specification, putting forward new features and enhancements. The current version is Release 13, with Release 14 to be presented in mid-2017.

LTE ('4G') 3GPP systems use OFDM modulation for the downlink, similar to digital terrestrial broadcasting systems like DVB-T/T2. OFDM exploits so-called guard intervals – or cyclic prefixes, in 3GPP language – to cope with self-interference in single frequency network (SFN) operation. Release 13 allows cyclic prefixes of up to 16µs. This translates into a maximum inter-site distance of about 5 km in an SFN to avoid self-interference. To cover large areas with such a network topology many transmitters are needed, which is likely to result in high operational costs.

From a PSM perspective it would be beneficial if a sparser network could be enabled, including perhaps even the use of some parts of traditional high-power-high-tower (HPHT) transmitter networks. The forthcoming 3GPP Release 14 will include 200 µs as an additional cyclic prefix while 33 µs (which was previously only specified at the radio layer) will also be fully enabled. Notably, 200 µs would support inter-site distances of up to 60km. This is close to a value of 224 µs commonly used in DVB-T networks based on HPHT infrastructure.

On the system architecture side, significant developments have been made with regard to a service layer for television services. A “pass-through” service layer will become part of Release 14, allowing a standard MPEG transport stream to be embedded into the 3GPP IP transport. The necessary interfaces between a content provider and



an eMBMS network have been proposed, together with the corresponding features for mobile devices. This would allow apps that make use of the new features to be developed in a standard way.

All of this has only been possible because of good cooperation between PSM and the mobile industry. PSM have received significant support from major players in the mobile sector, principally from vendors and manufacturers. However, some MNOs (mobile network operators) were strongly supportive as well. These companies, together with other stakeholders from different industry sectors such as safety services or automotive applications, started to realize that a broadcasting mode is not just a means to distribute PSM content. Rather, it may help to use infrastructure and network resources in a more efficient way to support a variety of very different services.

REMARKABLE SUCCESS

As a matter of fact, Release 14 will contain essential features for the delivery of PSM content over mobile networks. It is not an exaggeration to say that PSM engagement led to great achievements and deserves to be labelled as a success story.

Virtually nobody would have dreamed two years ago that many of the PSM requirements would make it into 3GPP Release 14 almost unchanged. Nevertheless, once the new specification is published it will be necessary to carry out a careful gap analysis to understand what is indeed contained in the final release

and what might still be missing. Among others, the contribution part, i.e. PMSE (programme making and special events) applications like wireless microphones or cordless cameras, could gain more momentum. The next step will then be to start trials in order to gain experience with the new technologies.

These enhancements to 3GPP to cater for television services refer specifically to LTE for the time being. However, the development of 5G may offer new opportunities beyond the capabilities of LTE. 5G will introduce a new radio access technology termed ‘New Radio’ to support various different use cases. MBMS has been anchored in the service requirements for New Radio as a basic element. However, as resources are limited and time is flying, 3GPP has decided to focus on other features for 5G in Release 15. If 5G is to suit the needs of PSM in the future we should not diminish our efforts to contribute actively to the 3GPP process. Clearly, this corresponds to a longer term engagement (beyond PSM and 3GPP being part-time companions) which may nevertheless be worth the effort to secure a place for PSM content on future devices.

¹SWR, Chairman of the EBU Strategic Programme FDS (Future Distribution Strategies)

²IRT, Chairman of the FDS Project Team CTN-Mobile (Cooperative Terrestrial Networks - Mobile)

³BBC, Chairman of the FDS Project Team MTS (Mobile Technology and Standards)

Bringing 5G into play in production

5G TECHNOLOGY WILL HAVE A SIGNIFICANT IMPACT ON MANY BUSINESS-TO-CONSUMER ACTIVITIES, BUT IT ALSO HAS A ROLE TO PLAY IN SOME B2B DOMAINS. MEDIA PRODUCTION IS ONE. EBU'S **HANS HOFFMANN** AND **DARKO RATKAJ** REPORT.

The emerging wireless telecommunications standard known as 5G has been identified as a potential game changer for the distribution of media content and services. A November 2016 EBU Technical Committee report (BPN 109) sets out opportunities that may emerge in this domain for public service media. However, the impact of 5G – and the opportunities for media organizations – will also suit several use cases in the production domain.

The use cases identified – outlined below – helped to establish the technical and operational conditions that would need to be met to ensure that 5G can address the needs of the media production community. These include purely technical parameters (e.g. throughput, latency, packet loss, jitter) as well as the requirements that are specific to the context of a given production situation (e.g. mobility, location availability, set-up time, and number of simultaneous devices).

FIVE USE CASES

1. Audio production

Live audio contribution would typically be required at sporting and cultural events, sometimes from high speed vehicles. Coverage of news events, via mobile journalism where an OB van is not present, would also require high quality audio links. Finally, crew communication for radio outside broadcasts also formed part of the audio use case.

2. TV production on the move

This use case covered television production with a vehicle, for online and mobile platforms, of content up to UHD TV quality, from single operator to multi-camera operations. In addition to high bandwidth requirements, motion at speeds of up to 360 km/h in the case of

Use cases for 5G in media production include mobility at high speeds.



motor racing should be feasible. The transport of telemetry information, intercom and device/cell management is a further requirement.

3. Production studio

5G could also find an application in high quality studio productions with both compressed and uncompressed video formats up to UHD TV. This challenging use case also incorporates seamless transfer from an IP studio network to the wireless 5G domain. This could include the support of a virtual private network to enable business/data exchange as well as content contribution with the ability to manage the QoS or bandwidth allocated to each element.

4. Remote editing

In this case the particular technical requirements centre around high speed file transfers and editing in either real-time or via proxy content. There should be upload and download of files for editing on site as well as editing from site of material that remains in the cloud.

5. Stage performers

There may also be a role for 5G technology in relation to the PMSE (programme-making and special events) equipment used by live

performers. This in particular includes wireless mics, in-ear monitoring, and a variety of service links.

The business advantages that may emerge thanks to the application of 5G in media production include the possibility of handling live productions with high quality and high bandwidth without the need for large production vehicles. There is a clear potential for cost saving and for reducing the complexity of the workflows, provided that 5G will be able to meet the technical and operational requirements.

The standardization activities around 5G are ongoing. Recognizing the need to ensure that requirements in the media production domain are well defined, in autumn 2016 the EBU Technical Committee created a dedicated Ad Hoc Group (AHG) to study potential applications.

The EBU has a well-established engagement with 3GPP, the global standardization body for mobile telecommunication technology currently developing 5G standards, through its programme on Future Distribution Strategies (FDS). Building on this, the AHG aimed to communicate the identified use cases and associated technical requirements to 3GPP in close collaboration with FDS.

Joined up thinking on DTT

THREE ORGANIZATIONS, THE EBU, DVB AND BNE, ARE COLLABORATING ON A NEW INITIATIVE TO PROMOTE THE BENEFITS OF DIGITAL TERRESTRIAL TELEVISION, PARTICULARLY IN COUNTRIES WHERE ANALOGUE SERVICES STILL DOMINATE. THE EBU'S **WALID SAMI** AND **MARCELLO LOMBARDO** PROVIDE AN OVERVIEW.

Although public service media (PSM) channels are widely available on subscription-based platforms such as satellite, cable and IPTV, terrestrial television remains the backbone for accessing free-to-air services and is the most widely used means of receiving television globally. Over 300 million households receive analogue television and nearly 200 million households receive DTT (digital terrestrial television), of which around 120 million are in Europe.

Despite the success of DTT, many countries around the world have yet to complete or even begin the digital switchover process. At the same time, there has been unrelenting pressure from big spectrum consumers, like mobile network operators, to secure the use of further portions of spectrum allocated to terrestrial broadcasting. Given the unique social and economic opportunities that DTT offers, it is in the interest of governments, broadcasters and other industry stakeholders to maximize their collaboration toward accelerating its rollout. This would also help preserve spectrum for use by terrestrial broadcasting in the long term.

JOINT INITIATIVE

To promote the win-win situation that arises when a DTT offer is successfully launched, the EBU, BNE

(Broadcast Networks Europe) and the DVB Project last year embarked on a joint initiative. The idea is to share knowledge and bring experts together to facilitate the successful introduction of DTT in countries that still rely on analogue television. The initiative is focused on ITU Region 1, and thus covers all of Europe and Africa as well as the Middle East and CIS countries.

The group has identified key factors that are crucial for the implementation of DTT. These include the process for identifying a suitable business model, the definition of the broadcast network parameters, the measures needed to ensure adequate video quality for viewers, and the strategy for creating an appealing programme portfolio.

Those key factors formed the basis of the first event organized under the new initiative, in collaboration with the ITU. On 26 October 2016, the ITU played host to a workshop in Geneva on "Assistance for DTTB implementation". It was well received by the diverse audience that included frequency regulators, broadcasters and relevant industry stakeholders. The response from workshop attendees confirmed that there is a real appetite for implementing DTT, but also a need to set out best practices with regard to the factors identified. There was also evidence of considerable interest in the transition from DVB-T to DVB-T2.

AUB AND ASBU

The group is now strengthening its collaboration in this field with the AUB (African Union of Broadcasting) and ASBU (Arab States Broadcasting Union), the EBU's sister unions in ITU Region 1. This collaboration aims firstly to refine the identification of the critical factors for DTT implementation, and secondly to raise awareness among broadcasters about the possible negative consequences for PSM of a failure to implement DTT.

Last February's celebrations to mark the tenth anniversary of the AUB provided an opportunity for fruitful discussions. The event brought together directors general of African broadcasters, presidents and secretaries-general of other broadcasting unions, and key figures from governments and the media to explore how to promote authentic content in the African media.

One of the most crucial messages the EBU, BNE and DVB brought to AUB colleagues was the ongoing need to defend access to spectrum for broadcasting. Even though broadcasters achieved significant success at WRC-15 (the ITU's World Radiocommunication Conference in 2015), the pressure on spectrum has not abated. There is a continued need for broadcasters to work together: successful DTT platforms will be the best shield against future attacks on spectrum as the broadcast community works towards WRC-19 and WRC-23.

With ASBU, collaboration is focused around a series of DTT-related workshops that take place every autumn as part of the EBU/ASBU week of technology. The EBU was also pleased to participate in the ASBU TV and Radio Festival from 25 to 28 April in Hammamet, Tunisia.



Marcello Lombardo being interviewed at the ASBU TV and Radio Festival in Hammamet, Tunisia.

Lift-off for DVB-T2 in Germany

KERSTIN PFAFFINGER (IRT) AND **KLAUS MERKEL** (IRT) OUTLINE THE CURRENT STATUS OF NEXT GENERATION TERRESTRIAL TV IN GERMANY, WHERE DVB-T2 HD SERVICES ARE ENRICHED BY HBBTV.

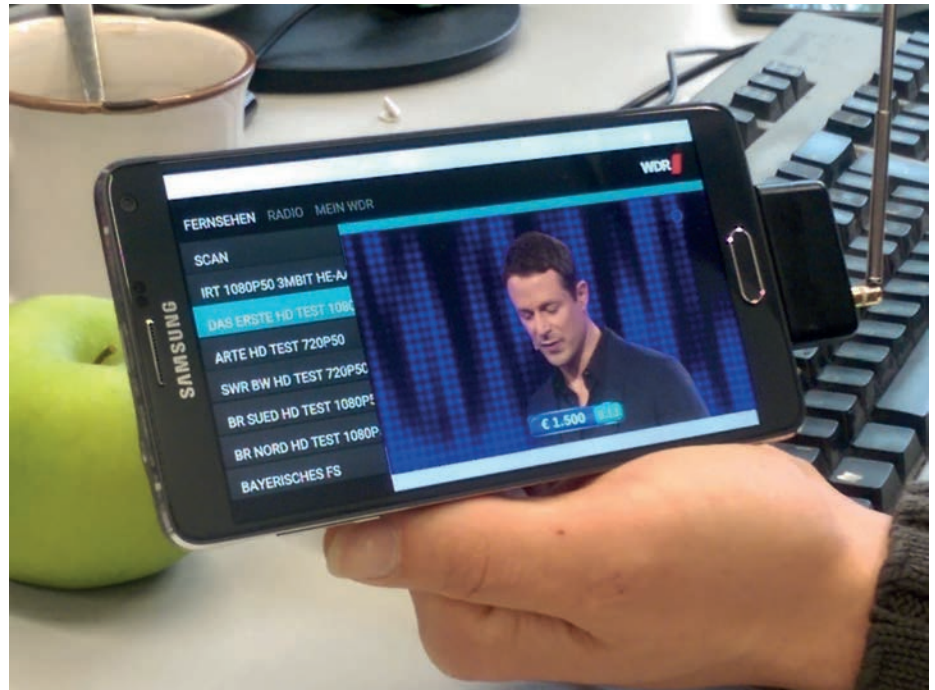
The official launch of DVB-T2 HD in Germany took place on 29 March 2017. More than 300 transmitters at nearly 70 transmission sites were switched to DVB-T2 smoothly and on schedule. With this rollout, almost 40 HD programmes from public and private broadcasters are now available. A total of six HD multiplexes are on air, with data rates ranging from 6.1 Mbit/s to 24.6 Mbit/s.

This first step of regular DVB-T2 operation focuses on metropolitan areas. Further phases of the gradual DVB T2 HD deployment are planned for autumn 2017, as well as for spring and autumn 2018. In mid-2019 a nationwide DVB-T2 HD expansion for public broadcasting services will finalize the rollout. Depending on the region, portable indoor, portable outdoor or fixed DVB-T2 reception will be ensured, and moreover mobile reception will be possible in wide parts of the coverage area.

The DVB-T2 HD rollout also sees the introduction of a new commercial model for the terrestrial platform, freenet TV. While public broadcaster services are still available free-to-air without any additional charge, the services of the private broadcasters are encrypted and can only be accessed for an annual fee.

FULL HD QUALITY

The fundamental strategy of the German public broadcasters is to maintain the terrestrial sector as an important element of ensuring diversity among different distribution channels. Terrestrial transmission represents a basic service with high reliability, which is independent of gatekeepers. A unique feature of terrestrial



DVB-T2 HD App for mobiles developed by IRT and WDR (Photo: IRT)

distribution is widely accessible portable and mobile reception.

With the transition to DVB-T2, the terrestrial distribution channel is modernized, enabling a greater plurality of programmes, an improvement in quality and a clear cost saving. This makes it an attractive option for consumers as well as for broadcasters. As the transition to DVB-T2 is combined with a simultaneous change of the video coding to the HEVC standard, a further efficiency increase is achieved. Therefore, the programmes can be provided in full HD (1080p/50), meeting consumer demand for high video quality.

KNOW-HOW FROM IRT

Extensive tests took place at IRT, especially in the context of HEVC video coding. Thorough analysis prepared the ground for configuration decisions taken by

the entire broadcast community. Different broadcast formats were evaluated, based on encoders and decoders from various manufacturers, and comprehensive transmission tests were performed in a test transmitter network. Furthermore, IRT supported the DVB-T2 HD rollout with several interoperability tests and workshops, for example organizing, on behalf of the Deutsche TV-Plattform, two DVB-T2 plugfests, in preparation for the launch.

One of the keys to the successful rollout has been the extensive work, in the context of DVB-T2, that was done up front in collaboration with national and international working groups, such as Deutsche TV-Plattform, the EBU and the ITU. Last, but not least, IRT represented the German broadcasters at the World Radiocommunication Conference 2015 (WRC-15) with



HbbTV adding services to DVB-T2 HD
(Photo: WDR/SWR/ARD-Digital)

regard to regulatory issues. At WRC-15 the basis was established to preserve the broadcasters' frequency spectrum for the next generation of digital terrestrial television, DVB-T2.

ADDING HBBTV SERVICES

The DVB-T2 platform as a whole has been significantly enriched on the service side by applying HbbTV. HbbTV, an open standard for hybrid broadcast and broadband services, is well established in Germany, with all broadcasters providing services and more than 12 million HbbTV devices in the market currently connected to the internet.

As HbbTV is agnostic with regard to the type of DVB system used, all the existing HbbTV services can also be readily applied to DVB-T2. This is, in fact, what has been done, thus providing a good number of high quality catch-up TV services and many more offerings like games or info services.

In addition to these standard services, Media Broadcast, as the commercial platform operator of

DVB-T2, has introduced freenet TV connect as a brand for a platform-specific HbbTV portal. This offers additional services like VoD, EPG or live video applications.

Finally, and on top of all these offerings, HbbTV is used to start a number of additional IP Live TV services from the receiver's service list. Those services are added to the service list during the regular service scan and allow the direct launch of HD Live TV, distributed via DASH adaptive live streaming. An HbbTV autostart app is used to launch these streams directly upon service selection without any further user interaction. This variant of adding live channels is used by both Media Broadcast and ARD. ARD uses the EBU-TT-D subtitling standard to include subtitles in these DASH live streams. Besides live streaming during last year's Olympic Games, this is the first regular and permanent use of DASH live streams in Germany. IRT has done a lot of testing and coordination work to make this advanced and standardized

streaming method a market reality.

In a next step, the migration to HbbTV 2.0 will add a bundle of additional features to all DVB networks, including DVB-T2, allowing the integration of companion screens, like mobile devices, or addressable television (enabling advanced audience segmentation, of particular interest for advertisers).

DVB-T2 HD MOBILE APP

Beyond reception of DVB-T2 on consumer electronics devices, there are offerings that use USB sticks on desktop computers or notebooks. However, mobile devices are also an interesting target. In collaboration with the public broadcaster WDR, IRT has developed an Android app that connects via MicroUSB to an external tuner stick.

The app, which does not require any specific device software, provides a browser environment to HTML pages, allowing access to and control over DVB-T2 programmes received by the stick. Thus, simple HTML5/JavaScript applications can present a variety of linear broadcast and nonlinear broadband services on the mobile device. The IRT implementation makes use of early versions of W3C specifications for television tuner control APIs.

Production at RTBF: all in one!

NUMPROD 2.0 IS A HUGE PROJECT AT BELGIUM'S RTBF. BY THE END OF JUNE 2017, EVERYONE INVOLVED IN PRODUCTION PROCESSES FOR TV, RADIO AND DIGITAL PLATFORMS WILL BE USING THE SAME SET OF TOOLS. **BENOÎT BALON-PERIN** (NUMPROD 2.0 PROJECT MANAGER) AND **LUC THUNISSEN** (MANAGER OF THE RTBF'S MEDIA SOFTWARE DEVELOPMENT TEAM) INTRODUCE THE NEW SYSTEM.

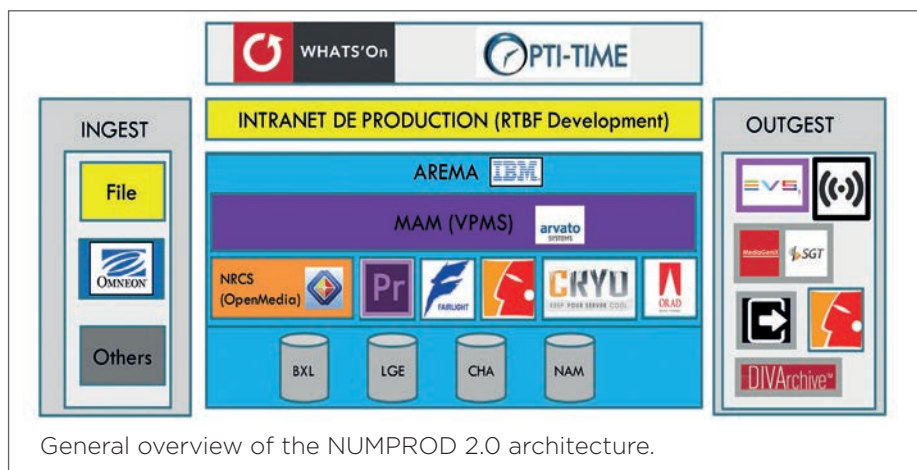
In 2009, RTBF launched NUMPROD – from the French *numérisation de la production* – a tapeless production system for its news and sports bulletins. The ambition was to roll this system out for all of RTBF's television production, comprising around 50 different television shows, news included.

Some tricky questions quickly came up: how could we manage rights in a global system? How could we share material between different teams and at the same time ensure that, for example, a face that we had promised to blur would not be accidentally unblurred when another team used the same content? We thought that if we could merge information coming from the resource planning system with the metadata for a specific item of content, the rights would be managed automatically. With such a link between the item and the people who have produced it, it should be possible to restrict access to sensitive content.

We did not manage in 2009, for various reasons, to deploy NUMPROD beyond the news and sports environment. But the foundations were laid for NUMPROD 2.0, the new production system launched at RTBF in March 2017.

WHAT WE'VE BUILT

In 2013, we decided to upgrade our NUMPROD platform. It was obvious that this new version would require a broader scope. It was defined as follows: cross-media, cross-genre and multi-site. The rights management issue came back onto the table, along with new issues related to radio workflows and new digital platforms. We chose a 'best



General overview of the NUMPROD 2.0 architecture.

of breed' approach, replacing some products and integrating some others (e.g. the radio system, Nétia).

RTBF's DevTec software department also developed a platform which is the final glue between all production systems in use. Our *Intranet de Production* (IDP) is a web-based application that enables everyone involved in production processes to schedule resources, to manage process hierarchy, to deal with rights and lifetime for media assets, to create asset placeholders in production systems, to monitor workflows between them, and finally to share content between the different distribution platforms.

HOW IT WORKS

RTBF's IDP introduces the concept of orders. An order is an item that associates production activities (shooting, ingest, editing, graphics, sound mixing) to subjects or episodes, and links those activities to human resources. There is an order type for each kind of activity and those orders are related to each other in a hierarchical structure (parent-child).

Let's take an example. In our traffic system, What's On, we can plan

to create a subject for an episode of a given series. Since the IDP is synchronized with What's On, in it you will find two orders, one for the episode (Unique ID, Title, Scheduled Date, etc., are inherited metadata) and one for the subject (with the same types of metadata, linked to the episode, as a parent).

If an episode or subject does not exist in What's On, the user can create them directly from the IDP.

We can now create orders for shooting, for example, and associate new metadata: in this case, a camera operator resource that will be scheduled for that shooting session. This is done by showing, in a graphical interface, all the resources available for a specific period that have the relevant skill (or perhaps as a secondary skill). That information is fully synchronized with Opti-Time.

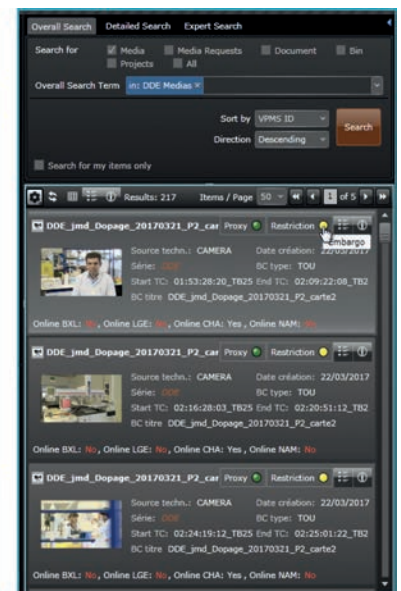
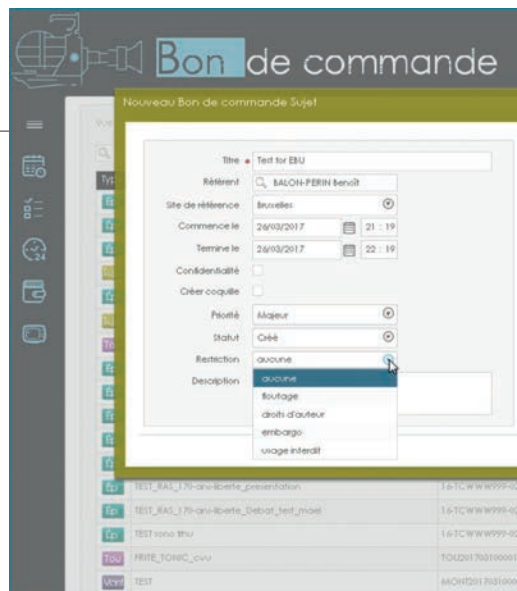
RTBF's activities are spread across different locations, with the main production centre in Brussels and regional sites at Liège, Charleroi, Mons and Namur. When making an association between a resource and an activity through the IDP, the user can choose the right resource for the right location, optimizing time spent on the road.

Restrictions applied in the IDP interface (left) are replicated in VPMS MediaCenter (right) with a colour code.

By associating a shooting session to a human resource, RTBF's IDP can trigger a planning notification to the resource him/herself.

We can then create orders for editing, sound mixing, graphics creation, etc., associated with the subject or episode in a hierarchy.

The IDP will simultaneously create placeholders in the VPMS MAM system, through the Arema platform, adding strategic metadata like Media Purge Date, or/and in the Openmedia NRCS. It will notify Opti-Time of the resource reservation and will even create a



project in Adobe Premiere for the subject or episode. It will also ensure propagation of changes throughout the hierarchy, if the schedule is changed or a resource availability

changes, for instance, and provides status monitoring of all orders.

RIGHTS APPLICATION

One panel of the IDP has been designed to be integrated into Adobe's ingest tool Prelude. When users are making an ingest through Prelude, they associate it directly to an order, fulfilling the placeholders in the different production platforms and ensuring the correct lifetime of the media ingested.

They can also, directly from ingest, apply sophisticated rights to the new media. For example, they can ensure that the media is only available for the episode production team.

So, from the first steps of the ingest, you can define the rights with three levels of confidentiality:

- strictly confidential: only you can see this content; it won't appear in your colleagues' search results.
- restricted access: your content will appear in your colleagues' search results but they'll need you to unblock it; you can define the type of restriction: copyright, blur, embargo, etc.
- open access: no restrictions.

Defining RTBF's IDP as the glue between all the components of the NUMPROD 2.0 project is then a good summary of what it does: it provides RTBF's production people with an easier way to understand and monitor all the processes necessary to produce more efficiently.

THIRD PARTY TOOLS IN NUMPROD 2.0

What's On (MediaGenix) is software for cross-media scheduling, workflow and content lifecycle, a traffic system that is used to reference and plan the content that will be broadcast on all RTBF channels.

Opti-Time (GeoConcept) is the tool used for planning field activities of human resources.

OpenMedia (Annova) is used as the NRCS system, allowing the creation and management of rundowns for the different shows. It's also a tool for journalists to follow newsfeeds from agencies, manage agendas, etc.

VPMS (Arvato) is a media asset management system, used to reference media assets and to add and manage metadata linked to them, as well as indexing it all to allow quick and efficient retrieval of assets.

Premiere, After Effects (Adobe) are used for video editing and graphics design.

EditMate (Arvato) is used as a collaborative editing tool and allows centralized management of editing projects.

Nétia (Radio Act) is the editing and broadcast engine used by RTBF's radio channels.

Arema (IBM) is an archive and essence manager. It is used to design workflows in the production system: ingest, transcoding, media movements, deep archive, and monitoring of all that orchestration.

Orad is used for the graphics.

CRYO is the CMS built by RTBF for its websites.

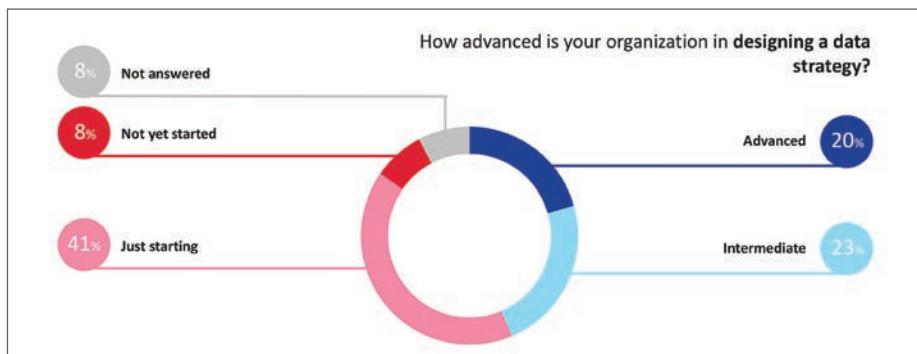
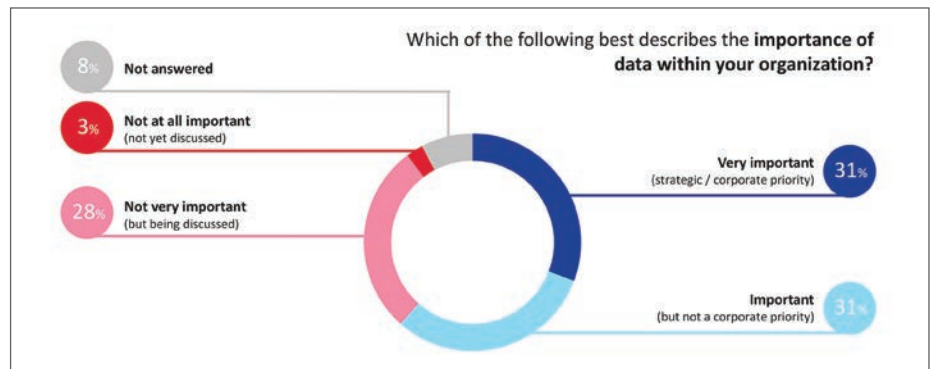
XT Servers (EVS), **Diva Archive** (Oracle) and **SGT** automation are also part of the whole project.

Data strategies: where do EBU Members stand?

THE RECENT EBU BIG DATA CONFERENCE GATHERED AN INTERDISCIPLINARY AUDIENCE OF 140 DELEGATES FROM 20 COUNTRIES. IN HIS OPENING SPEECH, GUILLAUME KLOSSA, LEADER OF THE EBU BIG DATA INITIATIVE, REVEALED SOME INSIGHTS FROM THE MEDIA INTELLIGENCE SURVEY, WHICH FOR THE FIRST TIME INCLUDED QUESTIONS ON EBU MEMBERS' DATA STRATEGIES. **ALEXANDRA BRENKMAN**, SENIOR MEDIA ANALYST, OUTLINES SOME OF THE KEY FINDINGS.

Based on answers from 39 organizations, the Media Intelligence Survey confirms that, for a majority of EBU Members, data is high on the agenda: 31% see data as an important topic and another 31% even consider it as a strategic priority.

Nevertheless, the results reveal that many EBU Members are still at the beginning of their data journey: 41% are just starting to design their

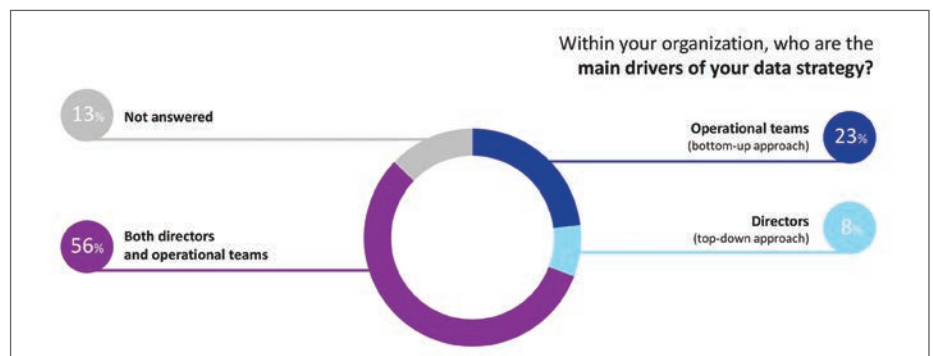


data strategy. At the other end of the spectrum, 20% of organizations declare that their data strategy is at an advanced stage, although only 10% consider themselves as advanced when it comes to implementing such a strategy.

The survey also highlights the different realities in terms of organizational approach. Many organizations are able to identify key executives in charge of data and analytics but, with a few exceptions, EBU Members have not yet created dedicated positions at the highest (director or C-suite) level. This may explain why 23% of Members attribute the increased prominence of data topics to a bottom-up approach, pushed forward by operational teams. A modest 8% see

work together on data topics, 18% of EBU Members say they have adopted a transversal approach and a common strategy. A majority (54%) of Members observe that data is mainly handled in silos, but with a shared understanding of what other colleagues are doing. 13% have not yet developed any corporate synergies and only have a siloed approach to data.

EBU Members can explore the



a top-down approach, recognizing top management as being the primary driver in this area. A majority of EBU Members (56%) perceive their data strategy as being jointly driven by both directors and operational teams.

When asked about the extent to which teams or departments

results of the Media Intelligence Survey in more detail at www.ebu.ch/mis (search for "Online & Data Strategies 2017").

More information about the EBU Big Data Initiative can be found at: www.ebu.ch/big-data

The eye catchers

FORMER CHAIR OF THE EBU TECHNICAL COMMITTEE **ALEKSANDAR TODOROVIĆ** PINPOINTS SOME OF THE COURAGEOUS DECISIONS AND PIONEERING WORK THAT USHERED IN THE AGE OF DIGITAL MEDIA.



Some forty plus years ago I attended for the first time a meeting of the EBU Technical Committee (as the Technical Assembly was called then) and entered the world of innovation and development in the fine art of broadcasting. Those were the days when the EBU discussed the adoption of the new broadcast transmission standard developed largely by broadcasters in the UK, France, and Norway – MAC, in all its variants – and when researchers in Europe, Japan and the US found that the composite colour standards were not the only way to produce and disseminate television. This simple discovery led some time later to a real watershed. Sony developed the “colour under” recording system; CBS pioneered the use of U-matic machines based on that principle, launching the ENG revolution and the EBU, believing that this new system could be improved, developed with Sony the U-matic H standard.

That was the time when the digital principle crept almost inconspicuously into the television domain, leading from the modest time base correctors quickly on to the first “serious” digital piece of equipment – the field store standards convertor developed by the UK Independent Broadcasting Authority. At the same time, it

“It took several years of intense study, and close cooperation with SMPTE, Japanese and American broadcasters, and manufacturers, to develop a universal digitization standard.”

prompted analogue technology to perform its swansong in the form of analogue component azimuth recording.

BRAVE DECISION

At a meeting of world broadcasters and manufacturers in Montreux at the end of the 1970s, it was decided that the future must be based on digital components. It was a brave but crucial decision and a good part of the EBU’s human and material resources were dedicated to achieving that goal. It took several years of intense study, and close cooperation with SMPTE, Japanese and American broadcasters, and manufacturers, to develop a universal digitization standard which became, in the form of ITU Recommendation 601, the cornerstone of the modern digital edifice.

The worldwide adoption of the new standard opened the door to the transformation of “digital islands into a digital continent”, to use the expression coined by Howard Steele, one of the leading figures at that time. During that digital revolution, the EBU continued to be one of the key players, developing and promoting a plethora of innovations: the parallel and serial interfaces, the first digital magnetic recording format (D1), the files and metadata. Above all, there was the great achievement of Leonardo Chiariglione and his ISO/IEC JTC1

Moving Picture Experts Group (MPEG) – the universally accepted digital compression standards.

“THOSE WERE THE DAYS...”

A brand new television standard – HDTV – was developed to replace standards that mirrored the technology of the 1930s and 1950s. The EBU actively participated in the fierce battle between different proposals. It strongly supported the common HDTV digital format and pioneered, through the work of the Moscow Group, a completely new approach to the subjective assessment of what was called “a new viewing experience”.

Some time later, those looking ahead saw clearly that digital production was not enough and initiated another courageous step, which would lead to the development of the highly successful family of digital broadcasting standards known as DVB.

Nowadays, in the all-digital world, the convergence of technologies is creating a completely new universe of moving pictures and accompanying sounds. The change is universal. Not only in the domain of content production and distribution, but also, and perhaps for the first time, in the domain of consumption. In the middle of that whirlwind the task of the EBU Technical Assembly remains the same – to look ahead and find the right answers to the increasingly difficult questions.

Where will Our World of TV be in 50 years?

HISTORY HAS TAUGHT US THAT MEDIA TRENDS FOR THE DISTANT FUTURE CAN BE SPOTTED, EVEN IF THE DETAILS ARE IMPOSSIBLE TO KNOW. **DAVID WOOD** LOOKS INTO HIS CRYSTAL BALL.



Summer 2017 is the 50th anniversary of the broadcast “Our World”. This was a gargantuan live 2-hour EBU Member production that involved broadcasters in 24 countries around the world, 400 million viewers, countless satellites, and (according to legend) one million miles of cabling. Though standard definition (SDTV) colour television had begun, many countries were still in monochrome, and thus (alas) “Our World” had to be made in black and white. But the show was a snapshot of that age with appearances from such notables as Chagall, Miro, Fellini, and the Beatles.

How does looking back at this help in our quest to predict the next 50 years?

Fifty years ago, colour SDTV was well developed. Just three years before, in 1964, Dr Fujio in Japan had the idea for HDTV. There were also rudimentary 3D HMDs (head-mounted displays) from companies like View-Master. Stereo sound was in use and in the early 1970s the world had a simple form of multimedia broadcasting through Teletext. The forerunner of the internet also became available in some countries in the early 1970s through systems like VideoText.

MORE OF THE SAME?

So, in the past 50 years we have moved from analogue colour SDTV and stereo sound with 0.25 Megapixels per image to (in many countries at least) digital HDTV with 1-2 Mpixels per image and stereo or surround sound. We are on the threshold of UHD TV with 8 Mpixels. Multimedia to accompany broadcasting has gone well beyond Teletext in sophistication, though with not dissimilar content. The internet today is a more advanced version of the old VideoText systems. And as a whispered aside, we have passed through two phases when 3DTV was fashionable and then dropped. We have also moved from 3D still image HMDs to simple Virtual Reality headsets using smartphones and to more elaborate computer connected HMDs .

This pattern suggests that future media will be an extension of the media elements we see today – the same only more so. More of

what we have now. What could this mean in practice? What is said by the experts about the future?

128 MEGAPIXELS IN 2067?

NHK in Japan have a rolling twenty-year plan for technology. They predicted correctly HDTV and UHD TV. They believe there will be a second UHD TV phase, the “8K” system with 32 Mpixel images. Following that, they anticipate “Integral TV” – a form of 3DTV, but better than stereoscopic TV. Let’s take a leaf out of NHK’s book and go into the prediction business.

If we have taken about 50 years to move from standard to high definition television, it is almost certain that in 50 years’ time there will be TVs with even greater definition. The only issue is how much greater. Television set manufacturers need to find ever new products that have a unique selling proposition. They will not stop at providing today’s 4K UHD TVs. In the next decades the 32 Mpixel TV (8K) is almost certain. Beyond that we will probably see 40 Mpixel ultra-widescreen television sets (12K) so movies can be seen as in the cinema. And then will come 16K televisions with 128 Mpixels. All this will take time, but probably by 2067 we will be in the 16K TV age. The 16K TV set will be the means for displaying a whole raft of multimedia, whether personalized or ‘shared experience’. We will see telephone video links with a similarly large number of pixels, given that we will have 5G and 6G internet available.

It may be that the media, 50 years from now, will be tapping senses other than eyes and ears, with tactile and sense of smell experiences. There is much more that could be said about the advance of the viewing experience and personalization, but all of these would be essentially extensions of what we have today. This is a justifiable assumption because this is exactly what has happened over the last 50 years.

If people in 2067 look back to 2017, let’s hope they too will find some broadcast content that is at least as memorable as “Our World” is for us today.

“This pattern suggests that future media will be an extension of the media elements we see today – the same only more so.”

Two layers good?

DVB PROJECT CHAIRMAN **PETER MACAVOCK** SHARES SOME THOUGHTS ON THE LATEST TERRESTRIAL TRANSMISSION STANDARD FROM ATSC.



The NAB Show 2017 saw the launch of ATSC 3.0. Traditionally seen as the major competitor to the DVB-T family, ATSC (Advanced Television Systems Committee) is finalizing a comprehensive upgrade to the much maligned ATSC terrestrial transmission standard, which is deployed in North America, parts of Central America and South Korea.

ATSC 3.0 is essentially DVB-T2 with two IP layers, one of which is designed to facilitate local programming, targeted advertising and other personalized services. Many details remain to be resolved, and demonstrations at NAB were restricted to mainstream applications that could

be covered using DVB-T2. However, hardware is available and LG showed off an ATSC 3.0 television set.

ATSC 3.0 is an ambitious project that comes at a time of much change in the US terrestrial market. The incentive auctions have yielded only 17 television stations proposing to go off-air, providing reassurance of the importance of terrestrial television. But the auction will result in a re-packing of terrestrial television, moving back down into VHF, with the potential challenge of trying to run services in the manmade-noise-ridden low-VHF band.

Will ATSC 3.0 succeed in being commercially deployed in the US?

We're not sure yet. Commercial ATSC 3.0 4k UHD terrestrial services in the 700 MHz band started in South Korea on 1 May 2017, ahead of the 2018 Winter Olympics in Pyeongchang. The question arises in DVB as to whether ATSC's ambitious adoption of two IP layers represents a wise move at this point, and whether the solutions they have adopted are appropriate for DVB. The broadcasting world arguably underestimates the benefit of having a single transport layer and, as we know, there are many different flavours of IP.

Inside DVB, work continues on targeted advertising, WiB, and updating the DVB-DASH profile. Lots to be done!

ABU makes security a priority

DIRECTOR OF TECHNOLOGY & INNOVATION FOR THE ASIA-PACIFIC BROADCASTING UNION, **DR AMAL PUNCHIHEWA**, PROVIDES THIS UPDATE ON ACTIVITIES AROUND MEDIA CYBER SECURITY AND SKILLS SHORTAGES.



The ABU and its sister unions, through the Technical Committee of the World Broadcasting Unions (WBU-TC), are studying issues around cyber security. As a member of the WBU-TC ad hoc committee, I have been leading initiatives to build awareness, educate, plan and act in this area. Cyber security is an increasingly important domain. Cyberattacks are increasing all the time, becoming more sophisticated in all regions and countries. Media organizations throughout the world – not just in Europe and the US – are committing significant resources to combatting such attacks and threats, and yet their number continues to rise. One impact is that countries are growing concerned about breaches of cyber security that could prejudicially impact

their sovereignty and their national security. Consequently, cyber security law, as a discipline, has emerged. We have initiated activities at ABU annual meetings, workshops and seminars to address issues around cyber security for media operations.

TOM MCGANN SUMMIT

The first Tom McGann Memorial Summit, organized by the IABM Educational Foundation, took place in Geneva in November 2014 in association with the EBU. Its aim was to convene all sides of the broadcasting industry to tackle technical skills shortages and to determine the future needs for engineering staff resources and how they might be met.

The second summit was held in

Kuala Lumpur on 4-5 March 2017. Delegates came from across the technology supply chain in Asia-Pacific countries. They included broadcasters, their product and service suppliers, representatives from training academies and academic institutions, and students interested in a career in broadcast and media technology. This mix enabled the summit to consider issues from secondary education through recruitment, retention and continuing professional development. Inevitably, these issues were also shaped to take account of changing technology, new business models and economic realities.

The outcome is an industry-wide call to action supported by an initial framework of related commitments to up-skill technical staff.

Data privacy: it's time for broadcasters to act

AS AN ADVOCATE FOR DATA PRIVACY, **SHEILA FITZPATRICK** (NETAPP INC) SPEAKS PASSIONATELY ABOUT THE NEED TO UNDERSTAND THE DIFFERENCE BETWEEN DATA PRIVACY AND DATA SECURITY, AND THE CRITICAL ROLE THAT EACH ONE PLAYS IN SUPPORTING SUCCESSFUL ORGANIZATIONS.

No matter what line of business you're in, you have data that needs to be protected. The imperatives are the same for the broadcasting industry, where companies have access to massive amounts of personal data about subscribers, advertisers, partners, employees, and even guest contributors that can include everything from personal contact information to credit card numbers to programming preferences.

If data privacy isn't near the top of your priority list, I offer three compelling reasons why you should start giving it more attention.

STRICTER LAWS

Technology makes it easy to do business anywhere. Customers around the world can download your mobile apps or live stream your broadcasts, creating additional value for advertisers that seek access to a bigger market. While globalization might be good for sales, doing business in different jurisdictions also means you need to understand the laws that apply there, even if you don't have a traditional bricks-and-mortar operation or data centre on their soil. Many of those laws are changing dramatically.

In the European Union, for example, the new General Data Protection Regulation (GDPR) takes effect on 25 May 2018. Among other things, the GDPR places greater obligations on organizations that process personal data. It expands the scope of what personal data is protected by law, and requires that



organizations obtain explicit and freely given consent. The penalties for non-compliance are stiff. If you don't keep up, you could create legal risks that threaten your company's ability to operate.

REPUTATIONAL RISK

These new legal obligations weren't created in a vacuum. The scope creep associated with the unauthorized use of personal data is driving the need for these enhanced data privacy laws, as consumers seek to reclaim their fundamental right to privacy. For example, advances in data analytics have changed the way that companies develop and advertise their products, but have also revealed how organizations take liberties with our

data by using it for purposes we never agreed to.

So while it's convenient for consumers to have a music app that recommends songs based on their activities and their listening history, many people would cringe to discover that their favourite app tracked not just when they listened to a song, but where exactly they were when they did so. Why? Because if you know where they listen to their music, then it's not a long stretch to identify where they work, which gym they belong to, or which routes they regularly jog. No matter how secure your app might be, people are more sensitized to their "electronic footprint", and have become suspicious of companies that aren't transparent about their data practices. In practical

terms, this means they'll delete your app, cancel their subscription, and tell their friends to choose another provider.

When data breaches happen – and they frequently do – the exposure by traditional and social media is swift and harsh, and it can be difficult for a company's reputation to recover.

BUSINESS NECESSITY

Going forward, organizations won't be able to collect information simply because it has the potential to be interesting or valuable. They'll need to be explicit and overt about what they're collecting and why, and how they're going to protect it. To explain that to customers, companies first need to know it and understand

it themselves. Even though this seems self-evident, I still encounter companies that don't recognize or accept that data security (protecting what you collect) and data privacy (only collecting what you legally can use for a given purpose) are not the same thing.

Security is about keeping things safe. It includes things like encryption and other methods to prevent unauthorized access to data, but it's only part of the picture.

Privacy is about the legality of what personal data you are allowed to collect, and who is entitled to have access to certain kinds of information. This means thinking about what information you're

EBU CYBER-SECURITY SEMINAR VIDEOS

The EBU's first seminar on Media Cyber-Security took place in February 2017. EBU Members can view videos of the presentations, including Sheila FitzPatrick's talk on data privacy and security at: tech.ebu.ch/cyber-security2017

collecting, what you're doing with it, and whether you have the legal right to have that information. It doesn't do any good to secure data you are not legally allowed to collect, process, access, store, share or transfer,

If your business model depends on being able to collect certain information, then you urgently need a strategy to meet your legal obligations and your customers'

expectations. Address privacy compliance first – once you have satisfied your legal obligations related to the collection and processing of personal data, then use security to build a fortress around that data to protect it from unauthorized access and use. Embrace the laws, don't run from them, and recognize compliance with data privacy laws is an urgent matter.

In the spotlight Grigoris Maliotis

DIRECTOR OF TECHNICAL SERVICES, CYBC

WHAT ARE YOUR CURRENT RESPONSIBILITIES AT CYBC?

As Director of Technical Services I am responsible for formulating and implementing the digital and technical development strategy for CyBC as well as introducing new technology. I manage the Technical Department (distribution and production studios) and the annual budget for technical services. I'm also responsible for designing and implementing training programmes for Technical Department personnel as well as preparing and evaluating technical specifications for the acquisition of new broadcasting technology and equipment.

WHAT DO YOU CONSIDER AS YOUR FINEST ACHIEVEMENT SO FAR IN YOUR CAREER?

As a member of the DTT Advisory Committee of Cyprus, I managed to secure a license (one of two) for a digital terrestrial network for CyBC. Also, I completed and implemented the digital network by 2010 and switched of the analogue network in 2011.

WHAT ARE YOUR PREDICTIONS FOR MEDIA TECHNOLOGY IN THE FUTURE?

The major challenge for media technology in future is how to make content available to the end user (on their choice of device, anytime and anywhere) in the most efficient way, by providing a new and improved user experience (personalization). Some other challenging issues are the convergence of broadcasting with IP technology, cloud-based content and the migration of media technology infrastructure to the cloud, UHD TV production systems, IP production studios, and distribution strategies on 4G/5G.

WHAT, FOR YOU, ARE THE MOST IMPORTANT CHALLENGES FACING EBU MEMBERS TODAY?

Broadcasting, as we know it, is changing rapidly. EBU Members need new ways of reaching audiences, creating new (probably different) content on new media. They need to work out how to



integrate new business models, new stakeholders and new production and distribution challenges in order to survive! EBU Members need to accommodate all of the innovation we're seeing in new media and keep up with market demand.

TELL US ABOUT SOME OF YOUR INTERESTS AWAY FROM THE WORKPLACE.

I live on an island with almost 365 days of sunshine, so for six months I swim every day. I also enjoy gardening, walking near the beach, watching soccer, travelling and reading books.

EBU

OPERATING EUROVISION AND EURORADIO

Innovation Theatre

GPAC OSS player

- Signalling:
 - HEVC Tiling (independent rectangular regions)
 - Single decoder!
 - MPEG-DASH with SRD (Spatial Relationship Descriptors)
- Compatible with other GPAC player features:
 - 3D native navigation
 - Any codec
 - Any delivery
 - CENC



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presentations, conversation,
Education, cooperation,
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