

tech-i

Targeting cloud-based and remote production



Plus

Multiplying the value of Europe's newsrooms
Frédéric Brochard (France Télévisions) on technology priorities
Why broadcasters still need the DVB Project, and vice-versa
and more...



Cover story: The COVID-19 pandemic has accelerated the development of remote production solutions that take advantage of the cloud. This issue of tech-i includes an update on the activities of the new EBU Hybrid & Cloud Production Group (pages 8-9), including a recent technology test at the World Biathlon Championships in Antholz, Italy (pictured on the cover). You can also read about Yle's development of a cloud-based radio studio and RTVE's use of 5G technology with cloud-based production and distribution.

Cover photo © Biathlon Antholz / Manzoni / NordicFocus

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Spearheading the renaissance of media innovation in Europe

Antonio Arcidiacono, Director of Technology & Innovation, EBU

Consider, for a moment, the differences between the US media landscape and our situation here in Europe. On the other side of the Atlantic, we find large and uniform markets where content and platforms can gain mass audiences and take advantage of considerable economies of scale.

Europe, in contrast, is a multicultural, multilingual patchwork of medium and (mostly) small markets: we are more than capable of producing interesting content and technology products but are limited by the size of each individual market. The potential return on investment constrains the amount of product development that can happen, whether in production or distribution.

These constraints were less of a problem before the age of globalization. However, today we see that the inability to compete, not only on production but also on R&D and innovation in general, leaves the door wide open for the large OTT operators – mostly based in the US – that can continue to invest in product innovation. With the exception of the anglophone native productions, other European products often find a natural resistance to export and consumption in markets other than their own national ones.

LEVERAGING AI & DATA

How can we address these constraints on investment? Can we avoid wasteful replication of efforts to develop distribution solutions that are deployed only at a national level? The answers lie partly in new AI-based and data technologies, including language management and smart recommendation among



the most obvious ones. These technologies can be applied to help create an offer that can be consumed in all markets at a sustainable production cost.

I see the potential for an enlarged content offer combined with a common set of products and distribution services aimed at a mass European market – more than 500 million people. With individual countries having increasingly diverse audiences, the smart application of AI and data technologies can help identify the best opportunities for export. And the economies of scale that arise will enable targeting of content and distribution services in the other four continents.

So, the way to address this challenge of Europe's non-uniform markets is in combining original, high quality content with technological innovation to attract audiences, while developing a sustainable set of products in the long term. To develop and maintain innovative products we must join forces and produce the required tools in both production and distribution technology.

We have recently announced

the first materialization of this vision with the launch of the News Monitoring and the Recommendation Box projects (see pages 10-11). AI technologies are leveraged to combine trusted news from multiple EBU Members, made available to any journalist or citizen in their own preferred language. This represents not only a wider choice but also a unique democratic weapon enabling comparison of independent information sources.

OPEN TECHNOLOGY

Part of our public service mandate is also that of setting the reference for technology innovation. It is a role the EBU has been fulfilling for decades, driving innovation in media technology in collaboration with international bodies such as DVB, SMPTE, ITU, HbbTV, 5G-MAG, ETSI, WorldDAB and others. Our historical leadership role was recently acknowledged with the receipt of three Technology & Engineering Emmy Awards (see page 4).

The EBU remains today the largest structure coordinating European media R&D&I activities. It is the natural candidate to lead the development of open technology solutions that benefit EBU Members along with the entire industry and society at large. I want to see the EBU leading a European hub of excellence in media technology development, driving innovation where technology and media creation come together. We must fight back to ensure we can leverage our own tools of production and distribution, so that citizens get the most out of Europe's rich cultural heritage.



EBU receives three Technology & Engineering Emmy® Awards

The European Broadcasting Union has been awarded three Technology & Engineering Emmy Awards for excellence in engineering creativity, recognizing three key technologies that were collaboratively developed by the EBU and that have shaped or underpin systems widely used by the broadcast industry today.

“These three Emmy Awards confirm that collaboration between organizations is key to successful innovation, and we will continue on this path”, says EBU Director of Technology & Innovation Antonio Arcidiacono. “They are proof of the power of collaborative, leading-edge innovation to shape the future of technology and make a lasting, practical impact. We’re very pleased to have the work of the engineers and experts who drove those developments honoured in this way.”

The first Emmy Award recognizes the EBU’s role in the creation of the **Advanced Authoring Format (AAF)**, an interchange file format that paved the way for cross-platform post-production workflows, the benefits of which are still enjoyed by the industry today.

The second Emmy Award honours the **standardization and commercialization of broadcast, hybrid electrical and fibre optic camera cable and connectors**, a design for physical interconnect solutions that helped to accommodate the growing bandwidth requirements in digital media production systems and has since come to be relied on by vendors, broadcasters and media creators around the world.

The final of the three Emmy Awards rewards the EBU’s contribution to work on **Common Encryption**, a fundamental technology design that separates the encryption function from the content contribution or distribution system and can accommodate the presence of multiple encryption or conditional access systems in parallel. The technology allowed industry participants to deploy successive generations of increasingly sophisticated conditional access systems as part of new services on satellite and cable.

Nominations are now being accepted for the EBU Technology & Innovation Award 2021
Visit: tech.ebu.ch/award

SMPTE elects EBU T&I’s Hans Hoffmann as President

The SMPTE standards organization has elected Hans Hoffmann, Head of Media Fundamentals and Production at the EBU, as its president for the 2021-22 term. On 1 January, Hoffmann became the first European in the history of the organization to serve in that role.

The appointment further strengthens the EBU’s ties and partnerships with the wider entertainment industry. The Society of Motion Picture and Television Engineers is based in the US and operates as a global professional association of engineers, technologists and executives working in the media and entertainment industry. Its work underpins many of the technologies used by media organizations around the world.

“It’s an honour to be elected to this leadership position at SMPTE,” said Hoffmann. “I look forward to collaborating with the fantastic SMPTE team in White Plains, the SMPTE Board, and the SMPTE membership to identify the Society’s gravity points — strengths and areas we need to develop to grow now and in the near future. We have a world of opportunity ahead of us, and we need to be agile in positioning the Society to delve into the areas that address the rise of the cloud, IP, remote workflows and media creation, artificial intelligence and machine learning, software in place of hardware, and personalization and ‘immersiveness’ in media consumption.”

Hans Hoffmann was also recently awarded the FKTG’s Richard Theile Medal 2020 for outstanding services in television technology. The award recognizes his services in the development of HDTV and UHD TV television systems and his significant contribution to international standardization committees.



Hans Hoffmann,
EBU Head
of Media
Fundamentals
and Production

Discussing the future of European media R&D

With the closure this year of one of the world's foremost R&D labs for broadcast technologies, the Munich-based Institut für Rundfunktechnik (IRT), it seemed an apt moment for the EBU Production Technology Seminar to explore the state of media-related R&D. A discussion panel with a primarily European focus, but also including NHK STRL (Japan), brought the online conference to a close and pointed out several paths to future success.

Gino Alberico, who leads the research centre at Rai in Italy, said a key question for broadcasters today was “make or buy?”, where it is important to find the right balance. PTS 2021 had shown several examples of broadcasters experimenting with available technologies – he highlighted Yle's first steps in synthetic media using a web-based tool – but broadcasters would still need to develop tools and infrastructure to solve specific needs within their own organization. Avoiding vendor lock-in should be a priority, he said.

His counterpart at BBC R&D, **Andy Conroy**, said that EBU Members can still play a vital role in R&D: “We can bring our values; that's what distinguishes us, *public service* media; we can bring our values to bear on the space.”

He pointed to the shorter development cycles that have become the norm and noted that, while many Members were working on similar projects, they were usually at different points in the cycle.

FUNDING GAP

Two institutes in the German Fraunhofer network were represented in the discussion: **Harald Fuchs** heads the media systems and applications department at Fraunhofer IIS, while **Ralf Schäfer** is responsible for the video division at Fraunhofer HHI. Both stressed the growing importance for the broadcast industry of EU-funded projects.

Ralf Schäfer pointed out that, as a public research institute, HHI has to work on topics where funding is available. “One problem is that in Europe we lost the consumer electronics industry and therefore it's quite hard to get funding for consumer electronics or broadcasting topics.” HHI continues to do relevant work, particularly on video coding, but also as an offshoot of applications for fields like medicine or security.

Picking up on this point, Harald Fuchs said that European projects continue to be important and that

the EBU has a role to bring together the requirements and views of the broadcasters. “We shouldn't forget that it's always important to be close to your own audience and to have a look at your local and regional needs and requirements and specifics. So, you cannot only rely on the big players from the West Coast, because they naturally have to have a global view.”

GAIA-X POTENTIAL

Both of the German panellists mentioned the cloud as an area ripe for development and collaboration. Once again highlighting the European angle, Ralf Schäfer saw the GAIA-X initiative as an opportunity to work on an open standardized platform. It might, he said, open the path to additional European Commission funding for collaboration, given that over-dependency on certain cloud providers could prove to be an obstacle for collaboration.

The director of NHK's Science & Technology Research Laboratories, **Kohji Mitani**, brought a perspective from outside Europe to the discussion. Picking up on the need for collaboration, which had also been identified by the other panellists, he mentioned personal data stores as an important topic for all countries and regions and thus one that was ripe for collaboration. When it came to personalized media services, “transparent and highly accountable technologies are required to enable our viewers to enjoy user-centred broadcasting services with peace of mind.”

Overall, the discussion re-emphasized the need for strong media-related R&D capacity in Europe and the importance of collaboration, both between institutes and across disciplines. The EBU is seen as a natural facilitator to coordinate such activities.



Clockwise from top left: Andy Conroy (BBC R&D), Kohji Mitani (NHK STRL), Gino Alberico (Rai CRITS), Ralf Schäfer (Fraunhofer HHI), Harald Fuchs (Fraunhofer IIS).

Yle works towards cloud-based radio production

Yle's **Mikko Nevalainen** describes how the Finnish broadcaster has created a fully-featured radio studio that runs entirely in the cloud.

Our vision for this project was that, equipped with nothing more than a microphone, a laptop and a good internet connection, a Yle radio presenter could go on air with all of the functionality and features they would have available in a typical radio studio. We delivered on this vision by putting everything in the cloud: the user can just browse to the appropriate URL, login, and go live.

The solution offers a simple way to replace a studio environment remotely, a need that became all the more urgent during the past year. But it can also serve as a lightweight back-up solution when you don't have sufficient studio space available.

USER-FRIENDLY

The main goals of this project were to prioritize ease of use in terms of the user interface and the user experience. It should be accessible at any time from any location and should enable fast publishing to the web for audio-on-demand or podcasts. Importantly, it should be platform-agnostic: available for deployment either on the public or private cloud or on premise. It

“A node that is to be used for the remote production of a full radio show might have several outside sources defined and set as inputs.”

can be used stand-alone or in hybrid contexts.

Once everything has been configured in the back end, the software takes care of connectivity, contribution and delivery. When the user logs in, the preconfigured settings are loaded in the front end. They see all of the different sources that might be needed for a radio show, such as regional news studios, music libraries, programme jingles, etc. There is also the usual radio rundown and audio monitors, while the provision of a talkback function is on the roadmap.

The system is based on a series of media nodes, each configured according to what should be available. For example, a node that is to be used for the remote production of a full radio show might have several outside sources defined and set as inputs. The node's own output would in turn be configured as an

IP stream with the appropriate codec, bit rate and sample rate for whatever service is targeted.

Once the user has logged in, loaded the appropriate playlist and configured their microphone, they can connect to the media player. The connection uses WebRTC and the Opus audio codec.

The output of the studio is mixed and delivered as an IP stream that can easily feed web-based players or audio-on-demand systems. FM delivery is also possible, simply requiring the stream to be routed to the correct place for playout.

TOWARDS DEPLOYMENT

Having successfully delivered the proof-of-concept, we are now exploring how to deploy this service as easily as possible. The aim is to use cloud-based distribution with a repository where we can set up docker images: you just spin up the machine and you have the studio environment up and running.

Although the complete system is not yet used in production, the playout function is already being used daily on three national channels. A Lawo mixing desk is used to create the live feeds as AES67 streams to the media network and the media node player is controlled as a webpage inserted inside Lawo's virtual UI known as VisTool. In this case the media node is running on a virtual machine with R3LAY Virtual Patch Bay as a soundcard interface, controlled with the Ember+ protocol.



A screenshot of the interface with a live (test) show in progress

A 5G journey to the cloud and beyond

RTVE has been pushing the boundaries of new production and distribution technologies on an innovation journey that will help define the future of broadcasting, writes **David Corral**.

To say goodbye to 2020 we decided to, in a way, technologically challenge the pandemic by doing a special broadcast. We took the opportunity of a concert produced by Radio3, our national station focused on music and culture, to come full circle on an innovation journey, both in terms of the production techniques and how we distributed the content to all RTVE channels, from radio or streaming to conventional television.

Technologies like AI and 5G have been on RTVE's innovation agenda for several years. In the area of telecoms technology in particular, we have taken pioneering steps for the media sector as a partner in the European 5G-MEDIA project.

FIRST STEPS

This particular journey, however, began in June 2019, at the 7th Global 5G Event in Valencia, we mounted what was one of the world's first stand-alone live 5G broadcasts for television. Within a month of that trial, we had begun using a public 5G network for news contributions.

A further step forward was to mix several cameras in the cloud and broadcast fully in 5G during a conference on advantages and risks of 5G in the audiovisual sector, organized by the European Parliament. Then, as part of 5G-MEDIA, a radio play called *La vida es sueño* was mixed entirely using edge computing. Other cases - and steps forward on this journey - included the use of purpose-built mobile apps to enable 5G broadcasts and a pilot project to install a small 5G cell in the Castilla-La Mancha parliament.

All of these previous steps prepared the ground for a truly impressive operation. At the end of November 2020, Radio3 put a new generation of Latin



Six different distribution channels were fed simultaneously from the cloud. Below: Shooting at Madrid's Casa América

American artists on stage at Madrid's Casa América. Taking the FM radio broadcast as a starting point, we used a multi-camera signal mixed in the cloud to serve all of RTVE's platforms, both conventional broadcast and digital, also providing vertical video where required. In what was another first for Spain, we used a 5G backpack to achieve this unique audiovisual coverage.

An audio feed taken from the mixing desk for the event was fed in stereo over a cable to a camera. This audio, the very same that was enjoyed by anyone listening to the FM radio broadcast, served as the unique reference for all devices and formats served by the audiovisual coverage.

CLOUD-BASED PRODUCTION

The camera receiving the audio was a standard RTVE model, but was now connected to a TVU One backpack, a unit with six modems, two of which are 5G and the rest 4G. The backpack signal was sent to a virtual mixer system, TVU Producer, that allows remote operation with low

latencies, as well as graphics overlays and preloaded videos, among other technical possibilities.

Added to the system, synchronized across the different connected devices, was footage from three smartphones, connected to a Wi-Fi network generated with a 5G router through the TVU Anywhere application.

The different video and audio signals were mixed and simultaneously distributed directly to their destinations from the virtual mixer. So, having started with a "simple" 5G broadcast 18 months previously, we completed the circle in leveraging native 5G and cloud broadcast techniques to distribute through the six outputs available on the system: in horizontal for YouTube, Twitter and Facebook, via RTMP for the RTVE website, SDI for our 24-hour television channel, and - as a novelty - in vertical for Instagram.

We hope that in 2021 we'll be able to go even further with this technology.

Live production in the cloud – learning through collaboration

From roundtables to hands-on tests, **Paola Sunna** explains how EBU Members and industry players have been working together on discovering and defining best practices for the fast-emerging field of cloud-based live production.

COVID-19 gave a boost to the use of the cloud for media production. For post-produced content this is relatively straightforward. For live production it is a serious challenge.

While office workers and families at home have become reasonably used to working, teaching and learning via Google Meet, Zoom and the like, professional live productions are much more difficult to ‘cloudify’ because they require more real-time interaction with strict timing constraints. Indeed, a survey performed by the EBU Hybrid & Cloud Production (HCP) group last September confirmed cloud production *workflows* to be the number one challenge for broadcasters.

To address the need for cloud production best practices, the EBU HCP group adopted a multi-perspective approach: exchanging the latest user experiences, identifying market solutions and organizing hands-on testing.

USER EXPERIENCES

Since September 2020, EBU Members have regularly exchanged cloud production experiences in biweekly group calls and dedicated roundtable sessions. In the latter, frontrunners present their latest learnings, triggering a subsequent conversation between the participating Members. The presentations are recorded, so those who missed a session can watch it later on. So far, experiences from BR, RTBF, RTÉ, VRT and Yle have been shared, providing insights into innovative production approaches for both television and radio.

Several areas emerged quickly as requiring further exploration:

- The first one is the choice of interconnect, including decisions on bandwidth, video stream codec (and settings), and bitrate. SRT is a popular choice for many current operations, but interoperability between applications and even between dedicated SRT encoders and decoders can be tricky to get right.
- Minimizing latency is a key aim. Depending on the combination of tools and interconnects this can easily go up to seconds (for the round-trip), which would rule out remote camera control and complicate two-way communication.
- Mix-minus audio is high on the list as another point to check. In practice, mix-minus returns for remote contributors can be created relatively easily with audio matrices and mixers, but for ease of use it is important to know how much of this functionality is present and directly usable in the cloud-based tools.

- A related topic that should not be underestimated in terms of importance is intercom. Complex productions require a robust back-channel for team communication. Intercoms nowadays span the whole space from dedicated (robust) hardware devices to virtual phone apps. It is a question of picking the right tools and understanding what dependencies are introduced.
- Maybe the most important feature that users are asking for is being able to create and recall set-ups easily. Given the potential complexity of the complete cloud-based set-up, it is essential to easily be able to go (back) to tested and trusted configurations.

MARKET SOLUTIONS

A second series of roundtables has put solution providers at the centre. In Q4 2020, the HCP group hosted sessions on Grabyo, Grass Valley’s AMPP, Kiswe Studio, Microsoft Azure, Simplylive, Sony’s Virtual Production, and VizRT’s Vectar Plus.

Solution providers can currently be divided into two main groups: cloud infrastructure providers and providers of ‘applications’ that run on top of the cloud infrastructure. A further subset of the latter are companies with strong broadcast expertise, that are effectively creating the cloud equivalent of what used to be hardware products (like video switchers). At the other end of the spectrum we find ‘digital services’ companies, where the emphasis is more on interfaces and workflows. The business model for all of them is a subscription and/or pay-as-you-use-it model.

HANDS-ON TESTING

The third activity of the HCP group consists of a number of hands-on trials in which Members and vendors test cloud-based live production set-ups. The first one was organized last month, for the Biathlon World Championships 2020 in Antholz. More tests are being planned for 2021.

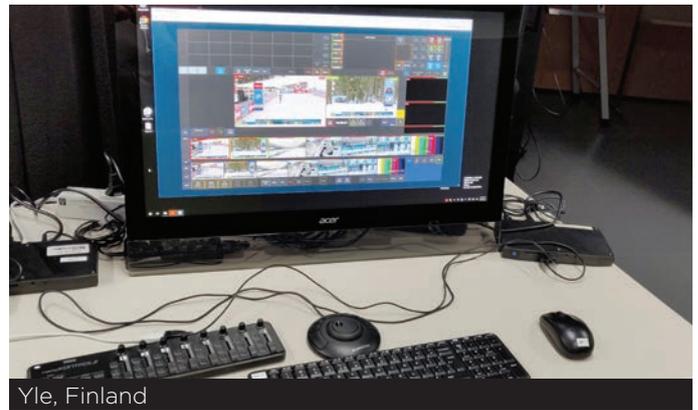
Learn, share, test!

The EBU group on Hybrid and Cloud Production has over 150 EBU Member participants. The group is led by Conrad Gouws (RTÉ) and Markus Ostertag (SWR), with Ievgen Kostiukevych and Frans de Jong of the EBU T&I team coordinating. The group meets ‘in the cloud’ every second week. Besides continuing the roundtables series (with Members and vendors) and trials, the group is working on a report with use cases, requirements, etc. More at tech.ebu.ch/hcp

Testing cloud-based production at the Biathlon World Championships

At the end of January 2021, the EBU, Eurovision Media Services, Finnish broadcaster Yle, Italian broadcaster Rai, Grass Valley, and Simplylive worked together to test cloud-based live production technology during the Biathlon World Championships in Antholz (Italy). For this test, the focus was on the backhaul of six feeds: three different main programme feeds and three additional remote-controlled PTZ cameras at the shooting range and an interview location.

The signals were received in Geneva, Helsinki and Turin, with Yle and Rai staff validating the reception in their broadcast centres using,



Yle, Finland

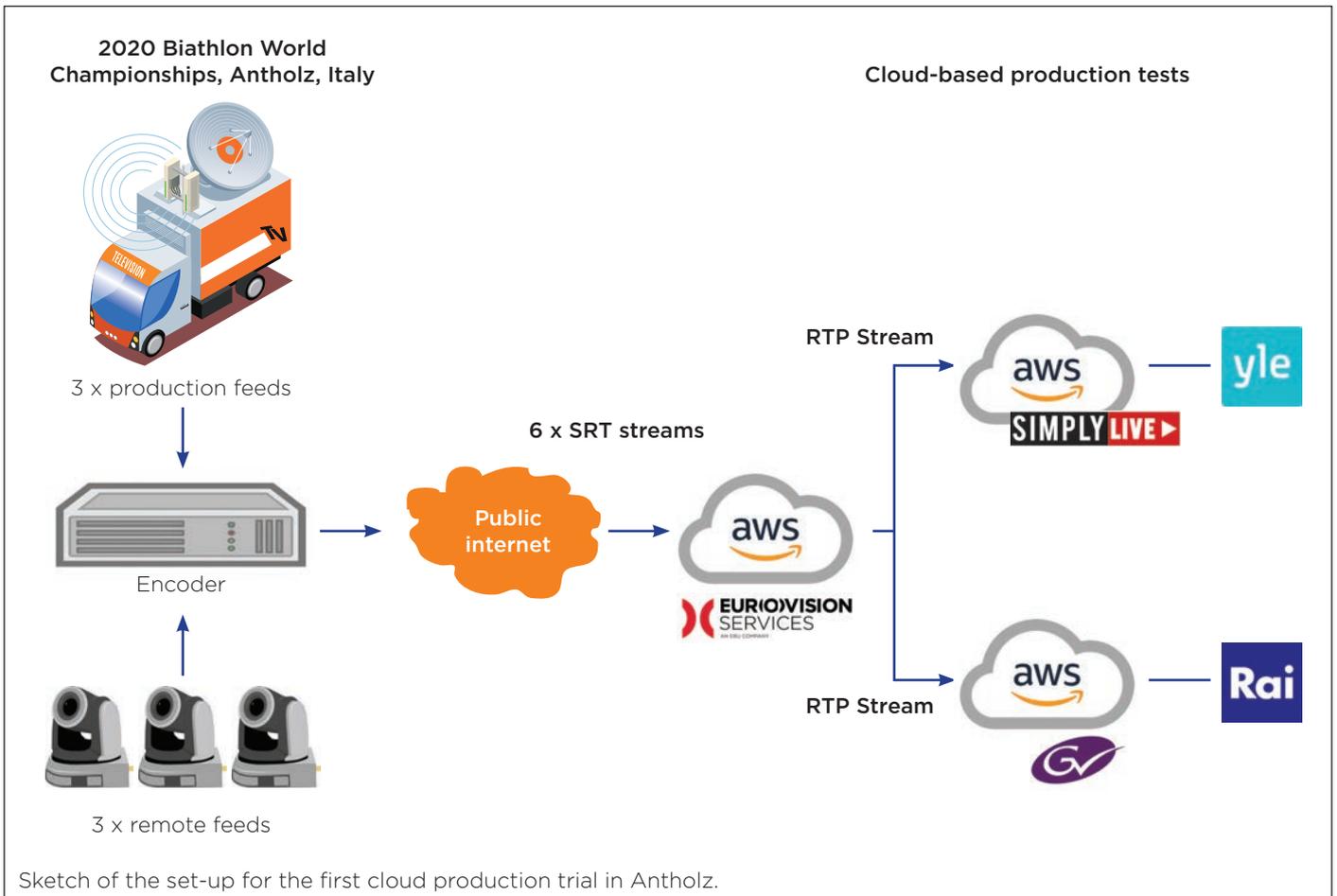
respectively, Simplylive and Grass Valley's AMPP production tools. The set-up was intended as the precursor to a larger trial where special attention will be paid to remote control of the cameras, audio, remote commentaries, and graphics integration.



Eurovision Media Services, Switzerland



Rai, Italy



Strength in diversity: multiplying the value of Europe's newsrooms

Justyna Kurczabinska, Head of the EBU News Exchange & News Strategy, introduces an innovative digital news collaborative project that gives journalists – and soon the audience – almost real-time access, in their own language, to news published across the EBU membership.

Public service media is Europe's largest newsroom, spending EUR 5.5 billion annually and employing over 40,000 journalists. There are 47 international all-news PSM services active in 2020, and many PSM are considered the most trusted news brands in their respective countries.¹

PSM produce strong, trusted digital content and have trusted digital platforms. The problem is that, today, we do not have in-depth digital collaboration in news, and we are thus not leveraging our strengths to the full.

What if we could exchange online content between PSM newsrooms in Europe?

NEWS PILOT

With this question in mind, in the spring of 2020 the EBU and 14 of its Members began to pilot a collaborative way of sharing digital news content among themselves. It was initially only for monitoring purposes internally in their newsrooms, but also with a vision to explore the possibility of publishing these news items in several languages across the participants' online platforms in the future.

At the time of writing, the monitoring tool that emerged from this project is collecting an average of more than 750 articles daily, offered through a simple web interface.

The application allows editors to filter the content by categories (sports, environment, politics, science, etc.), by source, and by date. Text queries can be entered to search for specific keywords.

At the end of every article, the user is offered a constantly

updated list of additional articles on the same topic published by other sources, generated using AI and machine learning technology from the EBU PEACH project. For busy journalists, this means precious time is not wasted searching for additional relevant content – they have what they need at their fingertips.

All articles are translated automatically into English, thanks to another EBU project, EuroVOX. The user can perform translations into additional languages at the press of a button. The tool currently supports Finnish, French, German, Italian, Portuguese, Spanish and Swedish, and more languages can easily be added.

EUROPEAN CITIZENS

The PSM organizations participating in the project are convinced that impactful, fact-based, and trustworthy news with public service values should be offered to the European audience more widely than today. This need is underlined by internationally relevant topics like climate change, the refugee crisis, tensions and polarization in European politics, and, right now, the economic and social impact of the COVID-19 pandemic.

In the words of Eric Scherer, co-chair of the Steering Committee, "This is a strategic project for all of us: for the EBU, for its Members and, not least, for European citizens. This is a tool against populism, a tool against misinformation, a very important tool."

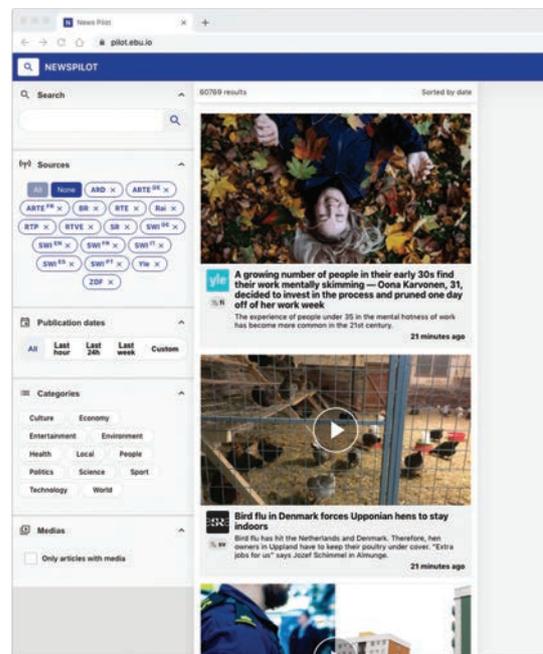
NEXT STEPS

February 2021 marked the roll-out of the monitoring tool to all the EBU Members participating

in the News Exchange, including radio-only Members who wish to integrate their content. This expansion of the pilot has been possible thanks to the recent decision of the EBU News Committee to invest reserve funds that had been earmarked for news in the monitoring tool, as a strategic innovation project. The tool has the potential to become an essential PSM hub of articles from all around Europe. As more Members join, the diversity of views will increase.

2021 will also see a move to testing the public-facing vision, displaying news from all around Europe on online pages where the participating news providers choose to integrate it as the Recommendation Box. This EBU News B2C project is now co-funded by the EU² and has ten participating Member organizations as of February 2021.

Each participating company will have full editorial control of all content published on its services. All workflows and technical solutions will be



¹ Public Service Media and News – EBU 2020 Media Intelligence Service

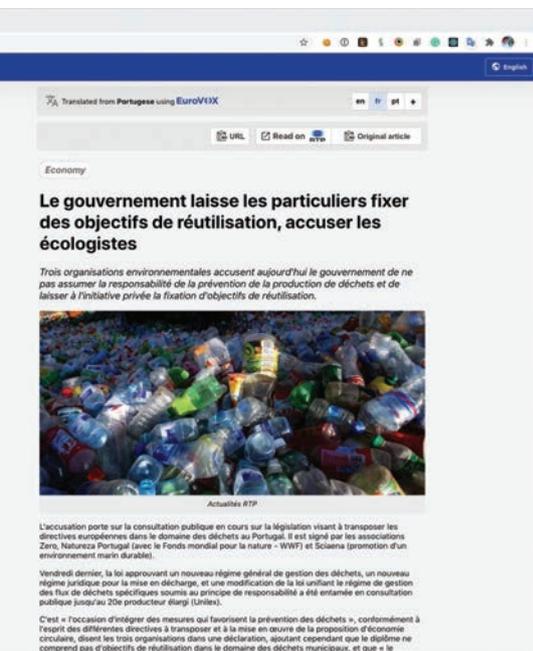
designed to ensure this goal is achieved.

Our value proposition lies in creating a first phase for an innovative network of news platforms sharing stories of high relevance and pan-European interest. The approach is based on using only high-quality content from respected public service brands on platforms that already have a significant audience in their own countries. This kind of news collaboration is distinctive, novel, and in the long run might offer an important alternative to social media platforms.

PARTICIPATING MEMBERS

The 14 participating EBU Members are: Belgium – RTBF; Finland – YLE; Germany – BR, Deutsche Welle, ARD/Tagesschau and ZDF; Ireland – RTE; Italy – RAI; Portugal – RTP; Spain – RTVE; Sweden – SR; Switzerland – Swissinfo (SRG SSR); France – FTV and ARTE.

² The EU funding has been awarded by the Directorate-General for Communications Networks, Content and Technology (DG CNECT) as part of a project entitled "Towards a European Public Sphere: Multilingual Programmes from across Europe". In addition to the EBU's Recommendation Box, the funding provides support to the European Collection, a curated selection of documentaries, magazine shows and reports on current issues in European politics and society. The European Collection is coordinated by ARTE and draws on programmes produced by France Télévisions, Switzerland's SRG SSR, and Germany's ARD and ZDF. The common selection is made available in five languages throughout Europe on the partners' digital platforms.



Translated from Portuguese using EuroVOX

URL: [Read on](#) [Original article](#)

Economy

Le gouvernement laisse les particuliers fixer des objectifs de réutilisation, accuser les écologistes

Trois organisations environnementales accusent aujourd'hui le gouvernement de ne pas assumer la responsabilité de la prévention de la production de déchets et de laisser à l'initiative privée la fixation d'objectifs de réutilisation.



Actualités RTP

L'accusation porte sur la consultation publique en cours sur la législation visant à transposer les directives européennes dans le domaine des déchets au Portugal. Il est signé par les associations Zero, Natuza Portugal (avec le Fonds mondial pour la nature - WWF) et Sciencia (promotion d'un environnement marin durable).

Vendredi dernier, la loi approuvant un nouveau régime général de gestion des déchets, un nouveau régime juridique pour la mise en décharge, et une modification de la loi unifiant le régime de gestion des flux de déchets spécifiques soumis au principe de responsabilité a été entamée en consultation publique jusqu'au 20e producteur étiqué (Unilever).

C'est « l'occasion d'intégrer des mesures qui favorisent la prévention des déchets », conformément à l'esprit des différentes directives à transposer et à la mise en œuvre de la proposition d'économie circulaire, disent les trois organisations dans une déclaration, ajoutant cependant que le diplôme ne comprend pas d'objectifs de réutilisation dans le domaine des déchets municipaux, et que « le Gouvernement décline cette responsabilité aux secteurs de l'économie ou à l'initiative privée des... »

Eurovision news monitoring tool: what's under the hood?

Sébastien Noir, Head of Software Engineering in the EBU Technology & Innovation Department, describes the main technical building blocks of the tool.

We designed the news monitoring tool in close consultation with editors and journalists, incorporating their feedback directly in the development. The goal is a tool that is easy to use, requires no training, and provides immediate value to the user.

Flexibility is an essential quality of the project. Every EBU Member has its own tools and workflows. We designed the pilot with solutions for all: content can be pushed to the tool's API at time of publication, or the tool can retrieve the newest articles every few minutes on the Member's REST API.

Once articles are ingested into the system, they are converted to a standard format: every article is represented as a list of sections (title, lead, headings, paragraphs, images, media, quotes). The text component of every section can then be translated. The audio and video files are downloaded and sent to EuroVOX for transcription and translation.

As soon as the text translation is available, the article becomes visible in the web application. This process takes a matter of minutes. The journalists therefore have access to the news almost in real-time.

The translation of content is handled by EuroVOX. Developed by the EBU and its Members, it is an open toolbox for transcription, translation and revoicing. It provides a single unified interface to language tools from the major cloud platforms (AWS, Microsoft Azure, Google, Speechmatics, DeepL, etc) alongside the ability to plug in smaller vendors and custom models. It also provides a web application that enables easy transcription and translation of content.

Journalists and editors can

review the steps taken: transcriptions can be corrected both in terms of text and timings to make the content more accessible. Once done this makes for a better translation, although the translation too can be edited if required. Finally, a video can be rendered from the translation using a synthetically voiced presenter, and optionally with either burned-in or embedded subtitles.

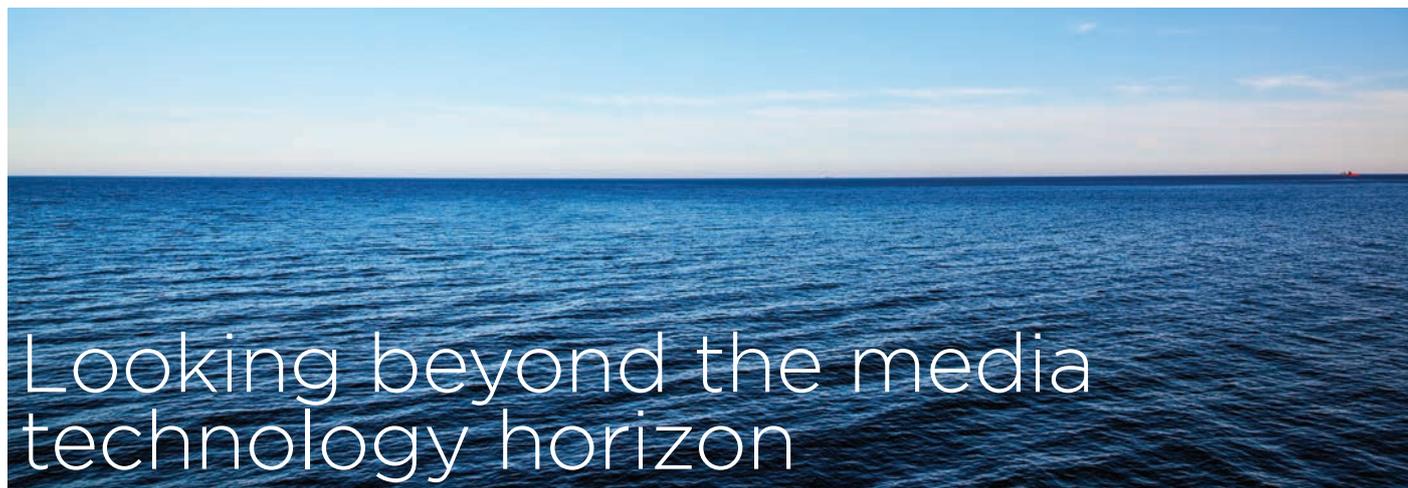
PEACH uses machine learning and AI to provide 'related article' recommendations. It works by converting each article into a vector representation using pre-trained deep-learning language models. The goal is that similar articles (semantically similar, even if different words are used) would be represented by vectors that are similar.

The vectors used may have more than 100 dimensions to capture the semantics of sentences. To find similar articles to a given article, we look up all vectors representing each article present in the hub and select the closest in the multi-dimensional space.

PEACH can also make use of user data; approaches like collaborative filtering will be taken later, when the content is shown to end users.

The next iterations of the tool will provide automatic extraction of *topics* from the articles. These will be used to surface trending topics in real-time, so that journalists can quickly identify what is happening now, from the perspective of EBU newsrooms. The user experience will also evolve, to permit a more focused exploration of the diverse content produced by European PSM.

See tech.ebu.ch/eurovox and tech.ebu.ch/peach.



Looking beyond the media technology horizon

A recent report from a group of public service media R&D labs presents an ambitious vision of the future media landscape. **Hans Hoffmann** and **David Wood** here summarize the three broad trends identified.

The EBU Broadcast Technology Futures (BTF) group, which brings together senior staff from public service media R&D labs, has recently published a report with their insights on the future technologies that may be part of, and help shape, the media environment in the coming decades.

This article is a taster, with much more detail in the full report, available from tech.ebu.ch/btf2020.

The report concludes that new media technology will arrive as component parts of three broad trends, related to user experience, content production and content delivery. The trends may impact at the same time or separately, and one may be consequent on another. Exactly what arrives, and when, will depend on local contexts and what is developed. There will be a 'right time' for the introduction and success of a range of new technologies, but it will not be the same in all countries. And the future will, of course, include developments that arise unforeseen today.

If there is a common overall thread to the trends foreseen it may be *greater convenience and flexibility for the user and the programme maker* and, most importantly, that the *customer experience and value proposition* will be at the focus of innovations.

1. TOMORROW'S USER EXPERIENCE

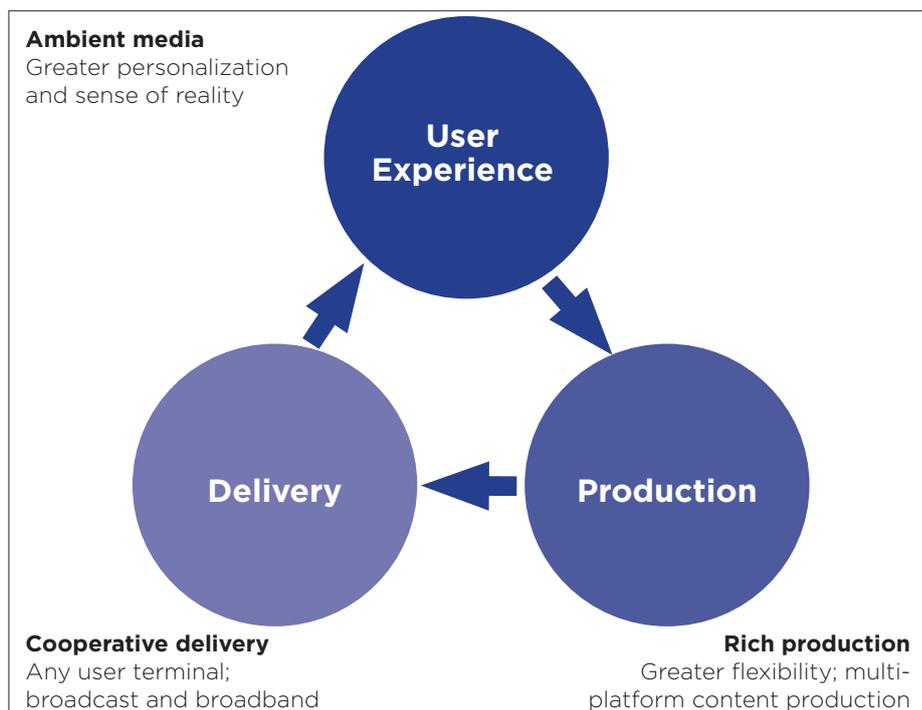
The rise of what can be termed 'ambient media' will have an impact in two domains: the user's control and the user's sense of reality.

In the future users will have **ever greater control** over what is before them – greater personalization. Services can include elements that provide additional information about the current viewing experience, help to find content of interest for the user, recommend content, and more.

The next decades may thus bring more options for personalizing the media

experience, including using more sophisticated voice activation and digital assistants. The options may be chosen by the user or be triggered automatically by the local environment or by the user's needs.

In addition to this increased personalization, users will have a **greater sense of reality**. This will include more realistic images, sound that can reproduce width, height, and depth, and multimodal presentations that may include haptics (technology that stimulates the senses of touch and motion). 'Space-sharing' content viewing may be possible, through which people in





Who is in Broadcast Technology Futures group?

- BBC, UK
- EBU, Switzerland
- IRT, Germany
- NHK, Japan
- Rai, Italy
- Yle, Finland
- VRT, Belgium

different locations may share the emotions of the experience with each other.

The overall impact will be a heightening of the sense of reality through more immersion and increased image and sound quality. A further new experience may be created by combining real or conventional media content with digitally created worlds. The BTF report goes into greater detail on all of these aspects and more.

2. TOMORROW'S CONTENT PRODUCTION

The second trend foreseen by the BTF group is the rise of 'rich production' for media content. Production facilities will increasingly be arranged to allow **production locally or remotely** or a combination of both. This will include outsourcing some or all of the production chain, and the use of the cloud (or, in fact, multiple clouds).

A further aspect of this trend will be increased **production flexibility**, whereby it will be possible for content to be made

- separately or at the same time
- targeting a range of different content formats, each serving different markets or different groups of users.

The decades to come will bring programme production that meets the needs of future user experiences in a multiformat world. Infrastructures will provide local, remote, and distributed production by using IP-based networks, the cloud and serverless computing. Production resources will become more 'available on demand'. The new workflows that will become possible will have a major impact on programme making. Metadata will continue to be a key enabler. AI and machine learning tools will support editorial staff in a variety of tasks, including programme generation and detection of fake news. And both sustainability and content accessibility will be strategic challenges for content production.

The full report, again, goes into detail on the points above, showing the ways in which content production may be transformed.

3. TOMORROW'S MEDIA DELIVERY

The third trend detailed in the report can be summarized as the rise of 'cooperative delivery'. This will firstly be marked by the emergence of a mixed delivery environment, where both broadcasting and broadband - wireless or wired - provide media services. Each will have their strengths, and different combinations will be used in different countries. 5G may be combined with satellite and/or terrestrial broadcasting in **intelligent cooperation**.

This will be coupled with the increasing availability of **all services on any terminal**, including fixed TV or radio sets, portables, tablets or smartphones. Content providers will, in each case, make use of the specific capabilities of these devices to reach and engage with audiences.

The delivery to the user of

new content forms and user experiences will see media services being available on a wider range of different types of receivers. The range of delivery platforms will remain terrestrial, satellite, cable, IPTV, wired and wireless internet and Wi-Fi, but some will be limited in the new kinds of services they can provide because of bandwidth or other limitations.

The new wireless broadband systems 5G and eventually 6G may have a significant role in providing media services. An attractive option may be to combine broadband services with broadcast services and create 'intelligent concurrent networks'.

FACTORS SHAPING SUCCESS

The technologies and services that will be successful in practice will depend not only on the novelty and capability of the technology itself, but on a collection of success factors that include: the prevailing societal and media climates; the desirability, affordability and availability of equipment and content; the challenges then faced by media providers; the need that the new development would fulfil; and others.

Can we go further and predict more precisely what will happen in the coming decades? Unfortunately, the future will be determined not only by what is probable based on today's knowledge, but also by ideas and systems that emerge unforeseen in the coming years. But while consequently we cannot predict the exact shape the media will take in the coming years, it is reasonable to assume that the trends and tendencies identified today by the BTF group and detailed in the report are accurate and will be among those that will happen.

Read the report and form your own judgement about what is at or beyond the media technology horizon. It is available for download from: tech.ebu.ch/btf2020

Who needs conventional broadcast networks when you've got the internet! Right?

Roland Beutler (SWR), who chairs the EBU strategic programme on Distribution, recommends caution when it comes to relying on the Big Tech companies. Above all, PSM organizations must work together.

With the proliferation of the internet and its apparently unlimited opportunities, many representatives of public service media (PSM) organizations seem to be losing faith in conventional broadcast distribution networks. We see PSM focusing more and more on on-demand content and services, which require bidirectional communication. The latter, by definition, cannot be offered by unidirectional broadcast networks. However, broadband networks, both fixed and mobile, which may be the appropriate option, are usually beyond the control of PSM organizations. They can make use of broadband networks only in the same way as any other service provider who wants to deliver some data or communicate with its customer base. Renting or leasing dedicated capacity on managed broadband networks may quickly become a very expensive endeavour.

It is not surprising, therefore, that there is massive hype about over-the-top (OTT) distribution across the internet. It helps to increase the reach of media offers, is undoubtedly very flexible, and can in principle give access to content both at home *and* on the move. Most importantly, it targets strategically relevant devices such as smartphones and tablets.

PSM organizations make use of OTT distribution through their own apps and websites. But they also utilize third-party platforms. Both ways have their pros and cons when it comes to fulfilling the requirements of PSM organizations related to



reach, prominence, attribution, branding, control and costs.

IN THE OLD DAYS

The internet used to be a *web* in the proper sense, meaning it consisted of many independent entities such as different core and access networks, exchange points and peering arrangements between participants. Microsoft primarily sold operating systems and office software, Google was a search engine and Amazon a bookseller. This is now a fading memory.

The so-called GAFAM companies (see image) set out to completely control the internet infrastructure end-to-end. Google and Amazon had built huge server farms to cope with their original services. These are now also used to offer all kinds of cloud services to external customers. They are heavily used by PSM organizations in production, contribution and distribution of their media services.

In the past, the deployment of undersea cables or satellite networks was typically achieved through creating international consortia. Nowadays, Google and Facebook are pursuing these kinds of network deployments independently. They target

building their own network infrastructure to connect the world. Facebook is launching a global satellite network; Google plans to deploy its own undersea cable between the US and Asia.

On top of controlling the physical internet infrastructure, Amazon, Facebook, Google and Apple are major content providers through their

respective platforms. Google and Apple have a dominant global footprint in mobile devices using their respective operating systems, Android and iOS. They are also now present in stationary devices such as smart TVs and increasingly in cars, with Android Automotive and Apple CarPlay. And finally, even though the European Commission tries to contain their influence, GAFAM seem to operate outside national or even supranational regulation.

DANCING WITH THE DEVIL

So, can the internet take care of the distribution of our content and services? In principle yes, but PSM organizations should follow the advice of a popular German (actually Bavarian) song: "If you want to dance with the devil, you better wear good shoes!"

It's unlikely that PSM will be able to buy good shoes off-the-shelf. Our only option is to join forces to gain visibility in a GAFAM-dominated internet world. This means defining our requirements and injecting them into the right bodies and standardization groups in a timely manner. The currently widespread notion of being better off going one's own way will fail when trying to dance with GAFAM.

Tackling climate change one conversation at a time

In January 2021, a new company-wide mobile app went live at ITV. Home Planet aims to make sustainability part of the day-to-day technology conversation at the UK broadcaster. **Matt O'Shea** tells the story.



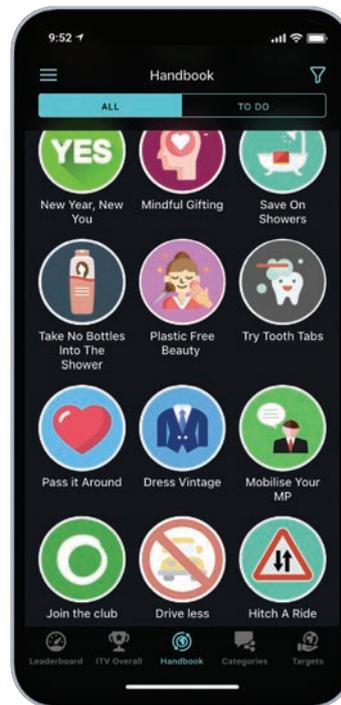
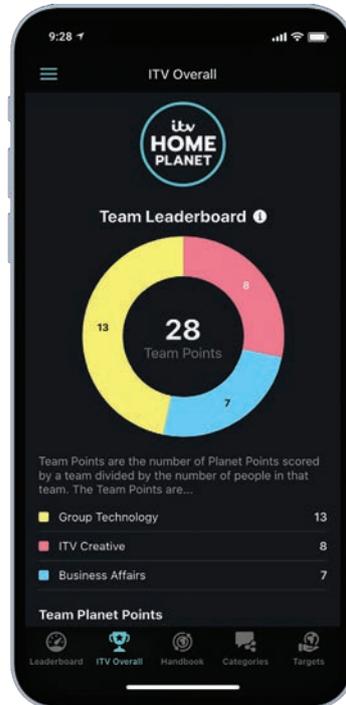
We started the ITV Home Planet journey in November 2019. ITV was busy developing new 2030 environmental targets and I had just taken on the role of Technology Lead for ITV's Green Team Steering Group, the group responsible for embedding change on the ground.

I was thrilled and nervous – I still am! I've been working with technology for more years than I care to remember, and I understand how serious climate change is, but bringing the two things together is tricky and it's new ground. There are two things working in my favour: the issue of climate change is one that the ITV teams will engage with brilliantly, and the people who work at ITV are a clever bunch. If we could raise the profile of sustainable living and climate change, bring the issue forward in the mind of our technology teams, then the plans would follow!

GAMIFICATION

Discussing all this with Marc, a colleague, we knew we needed to get the issue of climate change out there, and in the right way. The engagement should be fun; we wanted to inform and to inspire conversation. It was decided, we would gamify sustainable living!

What would become ITV Home Planet was born – and we had set our sights beyond the technology teams. Our very own mobile application would be available to everyone at ITV, with leaderboards so teams and



individuals could compete, and great tips for sustainable living.

Although convinced we had a good idea, we hit our first blocker: we had no funding and there were only two of us! On the upside, Marc is a great technologist, and I had a sense of what good looked like. Hey presto, we were a two-person product team!

We were going to need a low-cost, low-barrier-to-entry (so no databases!), intuitive platform. A platform that anyone could use to build mobile phone applications. A no-code platform. Marc quickly got to work testing no-code platforms, and I added tips for living sustainably to a Google Sheet. Marc found a platform that ticked all the boxes: Glide uses spreadsheets as a data source, it has a brilliant user interface, and (boom!) it has a free tier. Marc plugged Glide into my tips spreadsheet, and we had ourselves a prototype!

The great thing about the

platform was how quickly we could iterate – we failed really fast! We'd implement ideas as we thought of them and when they didn't work, we'd row back. The no-code approach made for rock-solid releases, so no need for all the effort of testing or release management.

THE TEAM GROWS

We had fantastic support from ITV Technology leadership. The results of a pilot were great. We expanded our team to three – enter Anna!

She added a much-needed creative touch to the application, turbo-charged our plans and made the idea of an ITV-wide roll-out a reality.

At the time, the ITV Client Strategy team was working on a commercial proposition called Home Planet. There were clear synergies between their goals and ours, they loaned us their branding (huge thanks Client Strategy!) and the product was complete.

It's early days but there are signs of something good. Sustainability is more a part of the technology conversation than ever, and the teams are setting up to rebalance the impact of technology on the environment.

Our no-code experience in developing and releasing Home Planet has shown us that the days of monolithic programmes are behind us. With today's technologies, the right idea and a small product team, our ideas can be realized as swiftly as they can be communicated.

Finding new levers to meet the challenges of tomorrow

The France Télévisions group of tomorrow will be free from the constraints of infrastructure and boosted by AI, writes CTO/CIO **Frédéric Brochard**.

Today, artificial intelligence already enables us to increase our potential and supports our public service remit by improving, for example, the accessibility of our 24/7 news channel franceinfo with the imminent deployment of semi-automatic 24/7 subtitling intended for the deaf and hard of hearing.

COLLABORATION & VIRTUALIZATION

Due to changing contexts, illustrated by the major COVID-19 crisis, and new modes of programme consumption, a successful business transformation requires us to be ever more mobile and scalable. Staying ahead of changes in collaboration methods and business needs therefore becomes a priority. The virtualization and flexibility of our technical ecosystem, far from signifying greater individualization, allows us to maintain proximity and increased collaboration in all circumstances. The tools adapt and make it easier to 'do it together' by abolishing distances and physical or geographic requirements.

Offering virtualized and secure systems, incorporating the latest innovations available from ordinary laptops, accessible with one click from anywhere in the world, allows our specialists to focus on their value-creating activities. The recent deployment of an office suite as SaaS (Microsoft Office 365), remote production, or even the virtualization of the entire news editing process (Dalet Galaxy xCloud), are only individual steps towards greater sharing, facilitated

“It seems essential to me to focus energies on the most interesting activities and with the highest added value for as many Members as possible.”

FRÉDÉRIC BROCHARD
CTO AND CIO, FRANCE TÉLÉVISIONS

communication, and the development of collective intelligence assisted by AI.

Moreover, other innovations, such as the development of open-source smart TV technologies, or even 5G, are encouraged by the development of synergies through our collaborations and our sharing of experiences with other players from the French public service audiovisual sector and within the EBU.

ESSENTIAL ROLE FOR EBU

All European public service broadcasters face the same challenges – adapting to new uses, new competition, the proliferation of technologies and distribution channels – while resources stagnate or even decrease in most cases. However, it is unthinkable to reduce the resources allocated to content creation, so it becomes necessary to find new levers. This is where I see the role of the EBU as critical in bringing together experts and interested Members around a topic.

However, it seems essential to me to focus energies on the most interesting activities and with the highest added value for as many Members as possible. I am convinced that CTOs are in the best position to determine the strategic axes to be followed thanks to their scope of action within their company. I hope that, in the near future, we can convene a discussion among CTOs in order to help the EBU's Technology & Innovation department and the Technical Committee to direct the work towards the most strategic and significant projects.

The health crisis has confirmed the importance of our public service remits and the social ties that we have helped to maintain, through our education, information and culture offers. It is up to us to confirm that the ties that bind our companies will enable us to meet the challenges of tomorrow!





Still serving broadcasters, with more urgency than ever

Hosted at EBU headquarters, the DVB Project has worked closely with broadcasters from the very start. DVB's Head of Technology **Emily Dubs** explains why this mutually beneficial relationship has a renewed importance.

In the DVB Project, we have seen a slow but steady decrease in the representation of broadcasters, with the manufacturers' constituency gaining in prominence. This may be partly due to broadcasters' increasing use of external technology providers. Our work, however, is more than ever a key success factor for broadcasters. And, virtuously, broadcaster involvement in DVB's work is also essential for the relevance of that work!

DVB has long been recognized for its widely adopted open standards, initially tailored by and for the broadcast industry. The flagship specifications DVB-T/C/S offer reliable delivery of television services to at least 1.5 billion receivers worldwide.

THE INTERNET CHALLENGE

In parallel, the internet, often seen as a different universe, has definitely transformed the way we consume television: giving access to a much greater range of content, allowing consumption to be easily time-shifted or personalized, and bringing television to a much greater range of devices that compete with the main living-room screen. OTT services rose on the back of a flourishing of innovation but they also created a huge challenge for the television industry.

Most broadcasters have tried to adapt in order to secure their prominence within the connected TV environment: more than 70% of EBU Members now offer a streaming app and PSM are increasingly involved in SVOD. But apps come with a variety of downsides, ranging from expensive maintenance on multiple platforms to poor visibility on end-user devices



Emily Dubs, DVB's Head of Technology

where a multitude of other apps are installed. And from the viewer's point of view this leads to fragmented and inconsistent user experiences without the simplicity they are accustomed to with television.

DVB sees the internet-driven transformation and the range of innovative features it has enabled as an *opportunity* for broadcast. We believe that an ideal media delivery landscape is a world where intelligent use of the unique characteristics of both broadcast and broadband networks enables a new wave of innovation and growth for both broadcast and broadband stakeholders. One could say that the media industry's future is all about IP, but for sure it will be a very long journey and hybrid networks will be the norm for a long time yet. This is why DVB is focused today on IP-centric solutions where IP services are delivered seamlessly through a variety of access networks (classic DVB networks and any form of broadband network).

RELY ON DVB-I

Our strategy is to optimize, which is to say standardize, this usage of hybrid networks, offering substantial opportunities for broadcasters, based on the overall DVB-I package. The latter, inter alia, allows DVB services to easily reach any type of IP device without requiring any specific application or integration. This will greatly help broadcasters to secure their prominence in a cost-effective way, while offering a seamless and unified hybrid experience to the users.

DVB's internet-centric solutions also promise new prospects for broadcasters such as:

- the possibility to offer tailored user experiences;
- a means of offsetting the drop in advertising revenues through the use of targeted advertising (more valuable than traditional advertising);
- a role to play in the 5G area, with DVB-I as a common media layer.

In addition to optimizing distribution costs, a range of new opportunities will also arise from the possibility to seamlessly switch the delivery means and deliver OTT through satellite, for instance, to reach remote areas.

DVB's mandate today is thus to deliver IP-centric solutions for unified and reliable media delivery serving the needs of the entire television industry, especially broadcasters struggling to serve all audiences in the face of increased competition and changing viewing habits.

We'd love to have your involvement. Please get in touch!

dubs@dvb.org

No single approach to sign-in dominates

The EBU Media Intelligence Service recently published a detailed report on user behaviour and technology trends related to sign-in. **Léa Besson** and **Dorien Verckist** summarize some findings related to sign-in at EBU Members.

Sign-in has become more the rule rather than the exception for accessing online services. The feature is implemented by many (but not all) public service media (PSM) throughout Europe and its importance is expected to grow. However, implementing a sign-in system (and especially those based on social platforms) raises some questions.

Through logins, online services and the companies behind them gain access to valuable first-party data. Such data can be used for a wide range of purposes; within PSM, our recent report shows, sign-in is mostly implemented to improve the user experience. Consequently, it is no surprise that 70% of EBU Members indicate sign-in development to be important.

The implementation of sign-in differs between Members. Thirty-one percent of Members who have the sign-in feature *require* its use to access some of their content or services, while 38% have no plans to make sign-in mandatory. Members where sign-in is mandatory to access all content remain the exception, at 3% (Figure 1).

SOCIAL SIGN-IN

Making sign-in mandatory could have an impact on the users. With growing concerns over data privacy, users have become more reluctant to share personal data with companies.

One of the key accelerators in this surge in privacy awareness was the Cambridge Analytica scandal, which concerned data obtained from Facebook users. Accordingly, the debate on social log-in has become particularly prominent.

Data from the European Commission shows that social log-in is used by 29% of

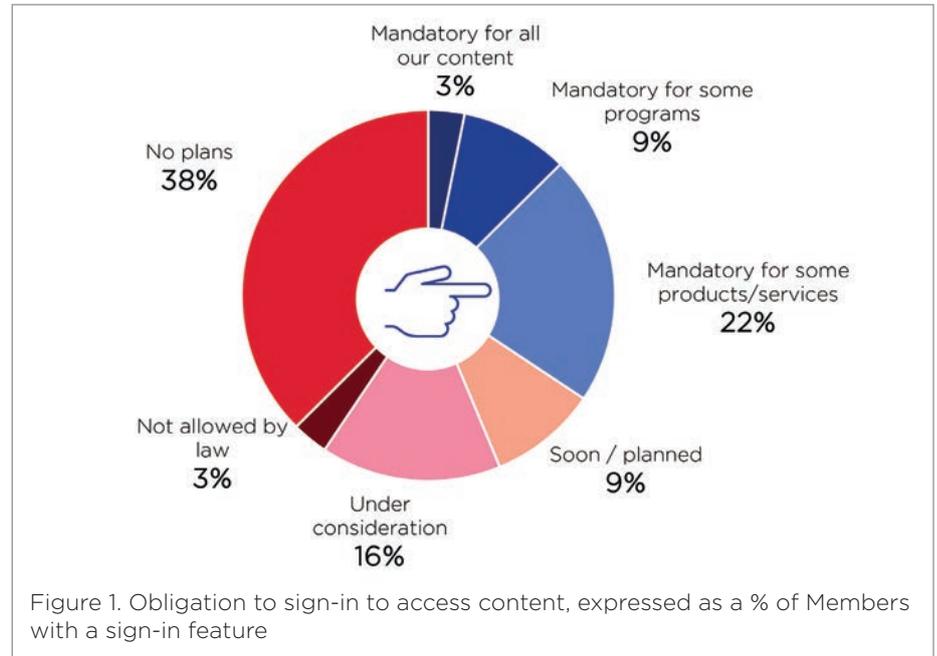


Figure 1. Obligation to sign-in to access content, expressed as a % of Members with a sign-in feature

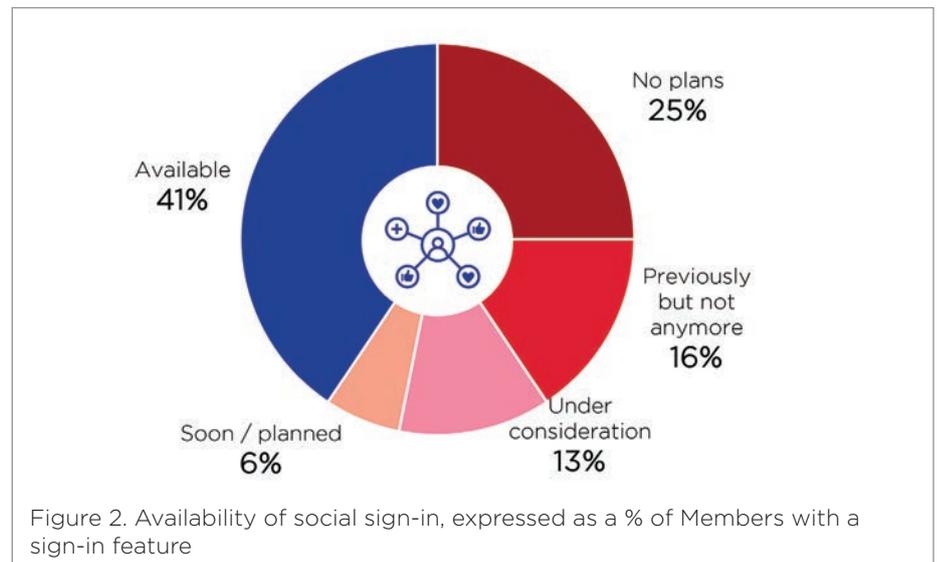


Figure 2. Availability of social sign-in, expressed as a % of Members with a sign-in feature

Europeans when accessing online services. Among youngsters (15 to 24 years old) the number rises to 50%. This makes social the second most-used log-in method.

Despite its popularity, EBU Members appear to be ambivalent on the issue, with debate presumably fuelled by the privacy-related objections. Where social log-in *is* available, Facebook remains the leading platform.

According to EBU data, even

though two out of five Members continue to offer social sign-in, 16% of Members have withdrawn the feature, pointing to a possible loss of popularity for the approach among some EBU Members (Figure 2).

It will be interesting to see which path EBU Members and other companies choose over the years ahead.

EBU Members can access the complete report "The Power of Sign-in" by visiting: ebu.ch/mis

Source: based on Members' data, including 32 Members who answered the question

Conference videos on demand

A selection of recent additions to our rich library of videos from EBU Technology & Innovation events, available to Members from: tech.ebu.ch/presentations



SUSTAINABILITY AND REMOTE PRODUCTION

CÉDRIC LEJEUNE

Assessing the environmental impacts of shifting to remote work



VIRTUAL PRODUCTION WORKFLOWS: THE RIPPLE EFFECT

KATHRYN BRILLHART & ERIK WEAVER (ETC)

Using LED video walls and game engines



MANIFESTO FOR AN AUTOMOTIVE USER EXPERIENCE

MARTIN KOCH (AUDI)

Creating a great radio experience in the car

IN THE SPOTLIGHT

Karl Petermichl

STRATEGY AND GOVERNANCE OFFICER TO THE CTO, ÖSTERREICHISCHER RUNDFUNK (ORF)

WHAT ARE YOUR CURRENT RESPONSIBILITIES?

I serve as “chief of staff” to the Chief Technical Officer of the ORF. This includes responsibility for governance processes and innovation management, coordination of workgroups and interdisciplinary projects, and alignment of our strategy and processes with finance, legal, programming and the general management of the ORF.

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

Over my 35 years in the company I have covered various positions, from sound engineer to project manager, from technical lead of 115 direct reports to my current position, so there is no single answer to this question. In general, I am very happy that I am well connected with all the different departments in the ORF, that I could be a mentor for many aspiring engineers over the years, and that I am part of the constant transformation of the ORF mission and vision, products and services – to serve our audience now and in the future.

WHAT ARE YOUR PREDICTIONS FOR MEDIA TECHNOLOGY IN THE FUTURE?

The focus must be on the end user and how we can deliver products that are wanted and consumed – media technology has to adapt to everything that is necessary to achieve this. This means more fragmentation in the production formats (from smartphone to UHD quality), in the distribution methods (linear and on-demand, broadcasting and streaming) and in the delivery packages (from ultra-short to feature length and from audio and video to virtual reality and data overlays). The

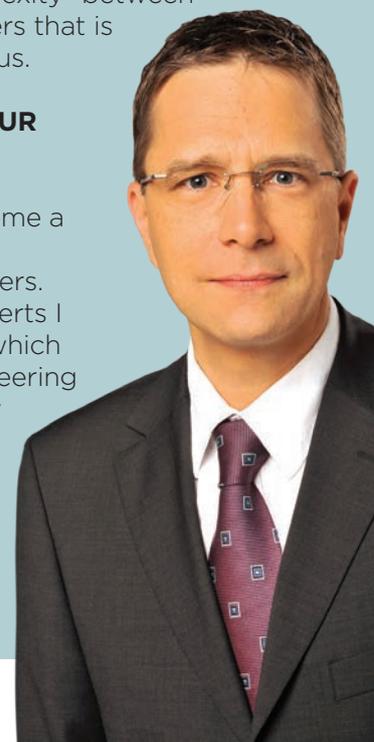
technological changes in the background are the usage of AI wherever possible, the transition to full IP media transport, and the adoption of virtualized, containerized and highly abstracted applications and processes in the cloud.

WHAT, FOR YOU, ARE THE BIGGEST CHALLENGES FOR EBU MEMBERS TODAY?

In a world of social media overload and highly competitive private broadcasters, a world of fake news and challenges like global pandemics and climate change, it is all about maintaining our values and at the same time staying relevant for our audience, to fulfill an important duty within modern society and to help shape the future. All public broadcasters must operate highly efficiently, offer the highest standards of accountability and transparency, adhere to EU regulations and media laws, and at the same time have to deliver for both new and legacy formats, care about sustainability, and work towards diversification. Overall, I think it is the aspect of “managing complexity” between all those constraints and enablers that is the biggest challenge for all of us.

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

As a teenager I wanted to become a professional jazz musician, on Hammond organ and synthesizers. During our rehearsals and concerts I always was the “sound guy” – which brought me to electronic engineering and into the broadcast industry eventually. Listening to music and participating in the cultural and creative scene here in Vienna is still my main joy on weekends, as well as spending time with my family, hiking and boating.



BRIO)ADTHINKING

AN EBU EVENT



tech.ebu.ch/events/broadthinking2021

Everything OTT
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SUSTAINABILITY SUMMIT

PSM GOES GREEN



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Join us and the industry's leading experts for technology updates, strategic insights and real-world use cases, plus demonstrations and networking.

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