MEDIA TECHNOLOGY & INNOVATION

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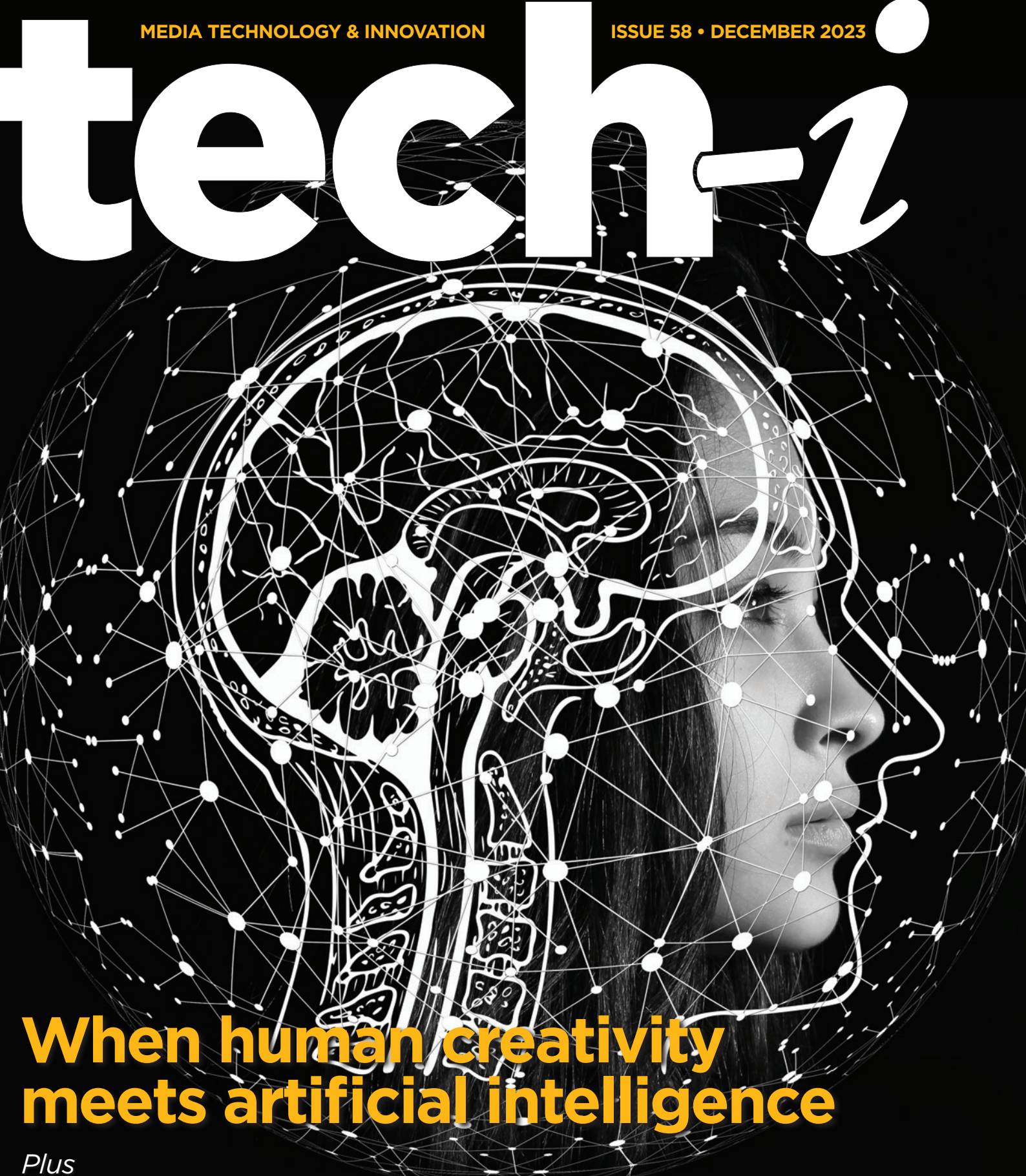

When human creativity meets artificial intelligence

Plus

- **A year of supporting the PSM technology community**
- **UHD on DTT in France and Spain**
- **vera.ai – a European project to tackle disinformation**

and more...

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tech-*i*

Issue 58 • December 2023

Cover story: This issue of tech-*i* looks at some of the ways in which EBU Members are leveraging AI to benefit audiences. Read about the recent EBU Hackjam on generative AI (p.6), the vera.ai project using AI to tackle disinformation (p.7), and AI-based projects at three EBU Members (p.8–9). We also present insights from a new EBU report on PSM and AI (p.18).

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Contents

Can we keep the information flowing?

Antonio Arcidiacono, Director of Technology & Innovation, EBU

Broadcasting is always on. Like water from the tap or power from the wall socket. But what happens when things go wrong? Or go really wrong?

These last two years have shown us that, even in Europe with our stable institutions, relative wealth and some of the most developed infrastructures in the world, things can go very wrong, very quickly. From extreme weather events to wars, terrorist attacks and a global pandemic, sadly it seems we are in a period of great upheaval.

When faced with this kind of trauma, people still expect and need to be able to turn on the tap and plug in the devices they rely on. They also need to have access to reliable and trusted information, flowing even when the world around is shaken to its core. Especially then. This is within the remit of public service media organizations.

Do we really see the provision of media as critical infrastructure? The EU's NIS2 Directive, which updates the cybersecurity rules introduced in 2016, must be implemented by Member States in 2024. It concerns sectors which "are vital for our economy and society and which rely heavily on ICT, such as energy, transport, banking, financial market infrastructures, drinking water, healthcare and digital infrastructure."

Businesses that operate services in the above sectors will be required to take appropriate security measures and notify the authorities of serious incidents. It is noteworthy that media is not listed among these sectors, although some countries are choosing to include media companies in scope for national regulations.

Whether or not they fall under the NIS2 requirements, the services provided by EBU Members – and especially their news and information services – must be considered as critical for society in times of crisis. And this means prioritizing resilience and business continuity and developing appropriate strategies.

Antonio Arcidiacono

Previous crises have exposed the weakness of power grids, showing that having one single infrastructure does not provide resilience. For electricity, a multi-layer solution is necessary, combining the power grid with local or individual power generation and storage. The same goes for the distribution of information.

APPROACHING MARS

Media companies need to proactively adopt resilient distribution approaches. These will always need to incorporate the four key principles: multilayer, anywhere, resilient and sustainable. I like to call this the 'MARS' approach, where a structural integration of native IP broadcasting and online infrastructures guarantees the necessary resilience, sustainability and quality of service.

Multilayer, because it combines different native IP infrastructures. Anywhere, because, thanks to the satellite component, it covers 100% of the territory complementing terrestrial networks that cover nearly 100% of the population. Resilient, because of the integration of different infrastructures and the possibility to use battery-powered endpoints. And sustainable – both financially and environmentally – with the smart use of edgecasting to reduce CDN costs, in combination with a common satellite IP delivery and, in mobility, a common 5G broadcast for cellular phones. Even outside times of crisis, the MARS solutions improve efficiency and resiliency, while potentially reducing energy consumption.

For mobile services, the MARS approach involves a combination of 5G cellular and 5G broadcast systems. Cellular networks alone can be compromised in times of crisis. FM networks are slowly disappearing in several European countries, and smartphones do not have FM or DAB receivers. The best solution for distribution of essential information, therefore, is 5G broadcast to smartphones which are battery powered and present in the pockets of most of the population.

The PSM community must take responsibility for business continuity management and ensure that we have sustainable plans in place for normal times and for the times of crisis. This means developing resilient, integrated multilayer IP infrastructures, from production to distribution, and working with the industry to facilitate the implementation of the MARS strategy[1].

[1] See also https://tech.ebu.ch/publications/r156

Video experts from EBU Member Rai looking at converted content

New EBU guidance on the use of HDR to SDR converters

The results of tests recently conducted by the EBU's Video Systems group show that dynamic HDR converters can create exceptional image quality, outperforming static converters in terms of highlight compression. However, artefacts may appear in certain cases.

Currently, for live production static HDR to SDR converters are most commonly used for converting high dynamic range pictures to the standard dynamic range that must be available to ensure compatibility with all TV displays. Static converters create high-quality, predictable results and are used worldwide – they're regarded as the safe approach.

Unlike static converters, however, dynamic HDR converters take into account the whole image and adapt their conversion strategy based on it. They may also take into account multiple frames and provide, for example, shot-based specific conversions. The result can be better quality SDR images – and maybe even better HDR images in the context of combined HDR–SDR live productions.

The test results (see EBU Tech Report 078) show that dynamic converters can outperform static converters in terms of highlight compression and gamut correction, but also that they can introduce noise amplification, temporal overshoots and changes in graphics levels. The report additionally provides some advice for users who want to experiment with HDR converters for their own productions.

Download EBU Tech Report 078 from tech.ebu.ch/publications. EBU Members can find more detailed test reports for specific converters in three supplements.

SMPTE fellowship for Ievgen Kostiukevych

One of the EBU's leading experts on media over IP, cloud technologies and remote production was made a Fellow of SMPTE, the Society of Motion Picture and Television Engineers in October. Ievgen Kostiukevych, pictured here with EBU colleague and SMPTE board member Hans Hoffmann, has worked with the EBU's Technology & Innovation Department since 2016, contributing to the development of industry standards, leading research groups and helping to develop a groundbreaking media-over-IP training curriculum.

How to match HDR cameras

Matching cameras is important to guarantee consistent quality in television productions, *writes Frans de Jong*. Matching cameras from different vendors has traditionally been difficult, and actually an argument (on top of financial and other reasons) for broadcasters to use only a single brand of camera, to avoid inconsistencies. Nowadays, many (large) productions include camera models from multiple vendors. Considerable experience has thus been gained in matching them, at least for SDR (standard dynamic range) productions. For HDR (high dynamic range) there is less experience. To help HDR producers match cameras, the EBU recently published EBU Tech 3376 – Baseline HDR Camera Painting Controls.

This document specifies two methods for generating settings for cameras from different manufacturers to create a unified look similar in colour and tone to a standard ITU-R BT.709 camera. These baseline settings can be used as an initial setup on top of which further adjustments may be applied to deliver the desired look.

The EBU encourages its Members to share the settings they obtain for a given camera so that colleagues using the same camera models can match

5G-EMERGE partners agree on a baseline system design

At a gathering in Turin in October, experts from the 5G-EMERGE consortium reached consensus on a foundational system design aimed at enhancing the delivery of online media through satellite-enabled edges, *writes Bram Tullemans*. Spearheaded by the EBU and funded by the European Space Agency (ESA), this collaborative initiative leverages 5G technologies to achieve seamless convergence.

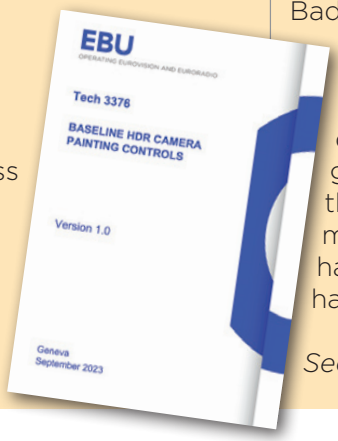
The primary objective of 5G-EMERGE is to bring data-intensive mass media closer to end users, enhancing their content playout experience. This is achieved through the use of satellite networks in combination with edge computing leveraging the 5G specifications as convergence technology. Added benefits, aside from edge functionalities, are reduced network congestion and a more resilient delivery ecosystem. Enhancing the resilience of delivery networks remains a strategic goal for the EBU membership (see p.3).

The recent meeting, hosted by the Italian public broadcaster Rai, marked a crucial milestone for the project. With the agreed-upon system definition in place, participants can now move into the design and testing phase for the components comprising the ecosystem. The project will establish five test beds across Europe in its initial phase. These test beds will utilize three different satellite networks (on the Ku and Ka bands) to validate the ecosystem across three distinct use-case classes: direct to home, direct to vehicle, and direct to edge.

Launched in June 2022, 5G-EMERGE is led by the EBU and co-funded by ESA under its ARTES programme. The other members of the consortium actively contributing to the project are: SES, Rai, Arthur D. Little, LINKS Fondazione, ROMARS, SixSq, Telenor ASA, Telenor Maritime, Telenor Satellite, G-Core, Varnish Software, TNO, NAGRA, Inverto, MBI, Artic Space, Athonet, Celestia, Viasat.

them more easily. The EBU will publish such contributions as supplements to Tech 3376. Currently two supplements have been provided by the BBC, for Sony and Grass Valley camera models.

The camera-matching publications are yet another result of the EBU HDR Workshop that was held last year at SWR in Baden-Baden, Germany (see p.14). It was there that Members identified that, while HLG HDR cameras from different manufacturers gave a consistent look in their default BT.2100 HLG mode, once painting controls had been applied, they were harder to match.



See: ***tech.ebu.ch/publications***

tems
trusted european media data space

EBU joins consortium for trusted media data space

October saw the launch of TEMS, an initiative to build a Trusted European Media data Space. The aim is to create a resilient data-driven ecosystem in the media sector. The initiative is supported by the European Commission's Digital Europe Programme (DIGITAL) and is a core element in the implementation of the European Data Strategy.

Joining a consortium of 43 organizations from 14 countries, the EBU is on the strategic board for the initiative and will coordinate fast prototyping and experimentation for collaborative and data-driven projects.

"We are actively supporting our Members in their digital transformation," said Antonio Arcidiacono, EBU Director of Technology & Innovation. "We are convinced a media data space will ease the development and adoption of data-driven technologies such as AI and foster innovation and collaboration along an increasingly complex value chain.

It is an important element for our ability to face competition from dominating US platforms, fulfil our obligations in the fields of public information, entertainment, and education, and do so in full respect of European rules and values."

On page 16, Véronique Demilly of France Télévisions explains how TEMS can be of benefit to European media companies.

EBU Production Technology Seminar 2024
30 January – 1 February, Geneva
Register now at tech.ebu.ch

Hacking and jamming with generative AI for the benefit of PSM audiences

More than 40 participants from across the EBU membership, plus some guests, gathered at the historic Maison de la Radio in Paris recently to explore different ideas and to generate prototypes.

"It was a great experience to be part of the 28-hour-long EBU Hackjam on generative AI, hosted by Radio France. The goal was to explore new ideas of how we, as public broadcasters, can make use of generative AI. What made the Hackjam and the exchange particularly exciting was the collaboration across diverse disciplines, with technologists and content producers working hand in hand.

In just two days, we went from coming up with an idea to actually implementing a functioning prototype. In our project, we used large language models like GPT-3 and LLaMA to assist journalists in enhancing the public-service quality of their content. I learned a lot, and collaborating on this project was a fantastic experience!"

Fabian Lang,
Deutsche Welle, Germany

"We created Sports Buddy, a mock-up of a friend explaining the rules of a game in the form of a chat, much like a conversation on WhatsApp. It used GPT-3.5 to answer the questions.

We tried it out on some matches in the Rugby World Cup. The audience member asked what the referee was doing, and Sports Buddy explained rules such as what a yellow card means.

At events like the Hackjam we can share how different people are applying emerging technology to solve problems across our wider industry. For example, I saw some possibilities in the re-versioning of content."

Clare Spencer,
BBC News Labs, UK

"Our objective in Paris was to illustrate how the utilization of transcriptions and generative AI for sentiment analysis of audio content in videos (and radio content) can produce enhanced metadata, something we're experimenting with at RTS. This metadata can empower journalists to efficiently capture highlights and provide prompt notifications or recommendations to our audiences.

The EBU Hackjam provides a unique opportunity for professionals from different PSM organizations, with diverse roles and expertise, to come together and collaboratively experiment, test, and develop prototypes that challenge existing visions, technologies and workflows to reach our audiences."

Jean-Paul Persiali,
RTS Digital Unit, Switzerland

"It was a really great experience. Our team tried to chain several technologies together to create a ChatGPT-based assistant that takes a question as audio for input and returns a video of an animated, talking avatar as the response.

We saw several interesting proofs of concept during the Hackjam. Naturally these are all at quite an early stage and concrete positive impact for PSM is a bit further down the line. Still, I'm certain that it is events like these, where employees from different levels and broadcasters come together and work together, that bring the biggest benefits.

I hear quite often that EBU Members should cooperate more and find synergies but this often fails because there are no direct touchpoints between the companies. This is why events like the Hackjam are so important."

Danilo Pejakovic,
BR, Germany

If you are interested in participating in or even hosting a future EBU Hackjam, please get in touch with Ben Poor (poor@ebu.ch).

Putting AI to work in the fight against disinformation

Lalya Gaye, who coordinates the EBU's AI & Data Initiative, introduces a European project that is leveraging AI to better equip newsrooms in the fight against disinformation.

The threat that online disinformation campaigns pose to media and society is exacerbated by their increased level of sophistication and the speed at which they spread. Time has always been of the essence in the fact-checking process, especially when it comes to breaking news, but news professionals are now in urgent need of advanced tools that can help them catch up with this new form of disinformation. With its ability to process and analyse large amounts of data on a scale and at a speed that can't be matched by humans, AI can enable newsrooms to level the playing field and help tackle this problem.

The vera.ai project – its name an abbreviation of Verification Assisted by Artificial Intelligence – is a multidisciplinary and collaborative project that tackles the problem of disinformation by supporting the work of fact checkers, journalists and media researchers with AI. Funded by the European Commission and the authorities in the UK and Switzerland, vera.ai focuses on user-centred development of professional AI-based verification tools.

The project is a follow-up to previous EU projects WeVerify and Truly Media, and its implementation builds on the InVid video verification platform that has already become an industry standard. The project consortium gathers 14 experienced partner organizations dedicated to the fight against disinformation, including the EBU itself and EBU Member organization Deutsche Welle.

PARTICIPATORY DESIGN

Since the start of the project in 2022, the project contributions of the EBU and DW have involved identifying end-user needs in the fact-checking, research and journalism community, translating these needs into actionable design requirements, and disseminating the project's results in order to maximize its impact. A participatory, user-centred approach to design has been used: applying an ethos developed in Scandinavia to empower employees and communities in decision-making processes, this approach is meant to take the perspective of all stakeholders into account and give them an equivalent say in the outcome.

The participatory design methodology ensures that tools are implemented in a way that fits into existing professional workflows as opposed to forcing end users to learn and adopt new ones. AI solutions are not meant to replace fact checkers. They're meant to be tools in the fact checker's arsenal against disinformation. And we need to make sure they integrate well into these professionals' workflows.

EVALUATION OF TOOLS

While the first phase of the project focused on user needs and design requirements, it is now entering a second phase that will see the implementation of new features and the testing of prototypes by end users. This evaluation is part of an iterative process that will unfold over the next two years, as we continue to apply a participatory approach.

A webinar on 6 December will update EBU Members about the progress of the project and brief them on how to take part in the evaluation phase. Also foreseen are training sessions and e-master classes with the EBU Academy over the next two years.

Please contact us if you're interested in the vera.ai project and would like to take part in making sure that its AI-based verification tools serve our media community to the fullest!

See: ***veraai.eu***

vera.ai is co-financed by the European Union under the Horizon Europe Framework Programme. Additional funding is provided by Innovate UK and the Swiss State Secretariat for Education, Research and Innovation (SERI).

When human creativity meets artificial intelligence – three projects at EBU Members

Deepfakes for good

Fraukje Heida (EO)

Deepfakes don't have the best reputation. Associations such as deepfake pornography videos, identity fraud, and political deception are commonly linked to digitally manipulated videos that appear incredibly realistic. But can deepfakes also be used to protect people? Can you use face swaps to make individuals unrecognizable on screen so they're still willing to share their stories in sensitive news items? And how can you do this in in an uncontrolled setting, for instance outdoors? EO, a Dutch broadcaster, set out to answer these questions in collaboration with NPO Innovation.

The way anonymity is currently often achieved has significant drawbacks. Showing a silhouette or blurring a face or voice negatively impacts viewers' perceptions. People feel that the guest in question has something to hide. Furthermore, blurring is labour-intensive during recording and post-production, and it takes away a significant portion of the guest's ability to express themselves. Viewers may find it harder to identify with the guest and show less empathy as a result. Can deepfakes provide solutions to these issues?

We have proven that it is possible to anonymize people in uncontrolled settings using deepfake technology without sacrificing their personality. But what considerations come into play when making such a choice, especially when trustworthiness is paramount?

Deepfake technology can be used to anonymize witnesses, whistleblowers, etc.

TECHNOLOGY & TRUST

Of course, there are practical considerations: using a target face that has similarities to the original face results in a more subtle deepfake, while using a completely different target face ensures better anonymization. Additionally, obstacles like dangling earrings, hands in front of the face, and flashes of light need to be avoided because they require a lot of manual adjustments and therefore increase the costs. Alongside technical findings, we also discovered that participants are hesitant to trust anonymization using deepfake as they have not yet seen proof that it works.

This is also the reason television crews are hesitant to use it, as the deepfake process can only be started after the final edits and is therefore deemed too risky. For this reason, new formats and other contexts that call for a gimmick are better opportunities to experiment with deepfakes than situations that might be a matter of life or death. We have compiled all these considerations in a manual and video.

Deepfakes make vulnerable individuals unrecognizably real, and their stories have never been told so compellingly. The question is whether the reputation of deepfakes can be changed for the better.

Thoughtful collaboration between AI and humans for storytelling

Anna Vošalíková (Czech Radio)

Digitální spisovatel – or Digital Writer – was initiated by Czech Radio in 2020. The project utilizes OpenAI's GPT, versions 2 through 4, to create a series of short stories for a radio audience. The first interaction with GPT was conducted via a far more rudimentary access point than the one we are accustomed to today with ChatGPT.

The first season of Digital Writer included five short genre-based stories generated using a number of prompts and settings. Stories in different genres were generated – romance, sci-fi, horror, true crime and historical drama – all performed by some of the leading actors and voice actors of the day.

The second season featured eight stories based on collaborative interaction between GPT-3 and human

The Digital Writer stories are brought to life by some of Czechia's leading actors

writers, who used AI to mimic their own creative processes. Some writers chose to take turns with the algorithm in writing their stories. Some had entire plotlines or characters generated by AI. Others even let AI finish the stories they themselves had started. The results were a vast improvement on the experimental nature and simplicity of the stories presented in the first season.

MIXED EMOTIONS

The second season of Digital Writer also included interviews with the authors, who spoke about their personal experience with the process. It would be fair to say that not all of them enjoyed the collaboration, while others did find it enriching and, if not that, at least fun.

The most recent season of Digital Writer was launched at the beginning of 2023. The third season brought short stories once again entirely written by AI. The audience also had a chance to engage with artificially generated radio reports performed by our most famous radio reporter.

We also created a fully fictional 'true' crime podcast that lends an odd perspective on the whole genre and the ethics of this brand of podcasting. This season allowed us to take a closer look at our own radio work and helped us figure out the true strengths of creative AI use: a consistent and thoughtful collaboration with humans.

Supporting multimedia workflows

Stefan Kollinger (ORF)

At the intersection of innovative technology and creative content, ORF, the Austrian Broadcasting Corporation, started an ambitious endeavour to not only deal with AI but to actively shape it. This vision is embodied in our strategic and literacy initiative AI DAY.

AI DAYs at ORF are more than just events; they are a space for the future, bringing together colleagues from various departments, internal and external experts, and visionaries. Employees are given a platform to exchange ideas about the possibilities and challenges of AI in media. Moreover, the events have succeeded in attracting multiple companies to inspire with their keynotes on generative AI, synthetic data, and various applications in administrative areas, content production, and distribution.

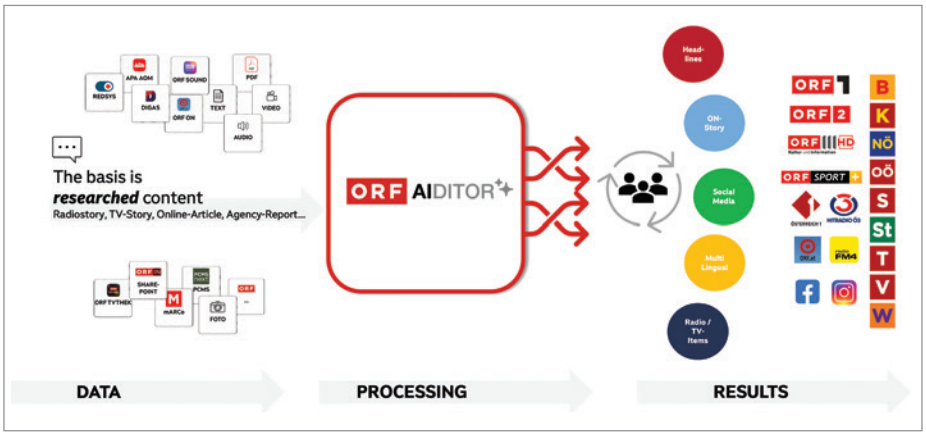
The beating heart of these initiatives is the ORF AI LAB – a creative and technological incubator serving as the hub of AI activities. Under the slogan "Join Forces" this lab initiates innovative projects that demonstrate how AI could transform the world of media.

TAILORED AI USAGE

A tangible product of this culture of innovation is the AiDitor, an in-house development by ORF, acting as a stand-alone web application. This tool aggregates various major AI services and offers users a 'playground' to experience the possibilities of AI first-hand. Client-capable and structured in customizable workspaces, the AiDitor allows for tailored usage, whether for internal organizations, departments, or teams.

Based on use cases from everyday work life, the AiDitor can generate texts, create images, generate audio, design social media posts, translate and transcribe texts, as well as provide a chat function. It aims to simplify work, secure ORF's technological leadership in the exciting field of AI and support the further establishment of multimedia workflows and products.

AI DAYs at ORF are more than an event – they represent a commitment to the future, where technology meets content.



Our technology year: supporting EBU members in creating engaging and trusted content

Unlocking the value of news

News remains at the very heart of EBU Members fulfilling their public service remit, with more than 40,000 journalists collectively making up Europe's largest newsroom. The EBU News Pilot has, over the last few years, created new tools to help unlock the value of this unparalleled asset, taking advantage of EBU technologies co-developed with Members – the PEACH recommendation platform and the EuroVOX transcription and translation tools.

For journalists and editors, 2023 saw the launch of NewsDeck, a real-time news-gathering platform that aggregates, translates, and indexes content from participating Members. Tests are under way to see how the application of generative AI technology could further enhance the value of this tool, always in a way that respects fundamental rights.

35 new publications

450,000 total publication downloads

250 new presentations

40,000 total presentation downloads

5,000 event/meeting participants

10,000 video plays

1,400 Member professionals engaged in T&I working groups

Source: tech.ebu.ch, Oct '22 to Oct '23

A hands-on workshop on LED-wall-based production led to a practical report on the topic

Reliable advice on operational essentials

From procurement of new digital services to the purchase and configuration of equipment, for EBU Members, making the right choices can save time and money.

Pooling expertise in EBU working groups enables the development of recommendations and reports that benefit the entire community. Publications in 2023 have included:

- Cybersecurity vulnerability management for media companies
- Personalized sound experience workflows
- Procurement of interoperable CDNs
- Tests of dynamic HDR converters
- LED-wall-based virtual production
- Evolution towards Dynamic Media Facilities

Coordinating a broad spectrum of positions on UHF

Every four years, the World Radiocommunication Conference makes decisions that can have major implications for broadcasters. At WRC-23, delegates in Dubai are discussing, among other things, how the UHF band below 700 MHz should be used in future. This is spectrum that EBU Members rely on for both terrestrial television distribution and wireless audio devices for production.

The EBU has ensured a coordinated approach across the membership, conducting influential studies, assessing different positions and assembling a team to ensure the voice of PSM has been heard both in the many preparatory meetings and at WRC-23.

ITUWRC DUBAI 2023

Building with the benefit of each other's experience

For many Members, transformation also means either refurbishment of existing facilities or the construction of entirely new buildings. Learning from each other is invaluable for these high-profile projects.

During 2023, the EBU New Builders community continued to share best practices, most notably through the popular site visits to new facilities. In May, the ARD news centre in Hamburg was the destination, while November saw a visit to ORF's new studios in Vienna.

Making 5G technology work better for EBU Members

EBU Members increasingly use mobile phone technology for news coverage, but public networks are not optimized for broadcaster needs. Private 5G networks showed early promise but required considerable work over and above what 3GPP delivered with the specifications.

Several EBU Members have been active in testing 5G for production use cases, both on their own premises and for remote productions. EBU working groups provide essential forums for exchange and collaboration helping Members to push the boundaries on media technology to the benefit of the wider industry and, ultimately, PSM audiences.

Members of the German DVB-I Pilot team, pictured on the EBU booth at IBC2023: Motoshi Bito (Vestel), Bram Tullemans (EBU), Frank Heineberg (RTL), Christian Klöckner (WDR), Rainer Biehn (bmt), Remo Vogel (rbb), Marc Hoffrichter (ZDF), Frank Strässle (bmt), Thomas Schierbaum (bmt), Ilona Kachel (ZDF), Rainer Kirchknopf (ZDF)

A bridge from the broadcast present to the broadband future

An IP-centric world brings distribution challenges for EBU Members, needing to fight for prominence in a sea of media apps and on devices like smart TVs, smartphones, in connected cars and more.

The EBU helped to foster the German DVB-I Pilot, which was recognized by a special innovation award at IBC2023. The project is showing how PSM can deploy the DVB-I specification for service discovery in partnership with commercial broadcasters. It provides a potentially powerful way for EBU Members to ensure their services remain universally available.

Helping Members leverage European funding

The European Union and other supranational public bodies are important enablers of technology innovation. Funding is available to EBU Members but accessing it can be complex and time consuming.

The EBU has a strong track record in helping Members to benefit from participation in funded collaborative projects. Over the past year, the EBU has played a leading role in several publicly funded projects, selected where there is clear added value for PSM and where at least two EBU Members are involved in the consortium.

STADIEM
Tapping into startup-driven innovation

vera.ai
Using AI to tackle disinformation

5G-Emerge
Enhancing online media delivery

tems
trusted european media data space
Building a trusted media data space

TRANSMIXR
Pushing the boundaries of social XR experiences

Getting to grips with the rise of generative AI

While EBU Members have been exploring and using AI and machine learning for several years, the recent acceleration in the capabilities and accessibility of generative AI tools has raised many questions as to how best to apply this technology.

The EBU, especially through the AI & Data Initiative, has taken a lead on pooling knowledge and connecting experts in this field. Priorities in 2023 have included investigating, on behalf of Members, things like open-source AI as a means of unshackling from the big technology companies and work on benchmarking alternative AI solutions.

France Télévisions pioneering free-to-air UHD in France

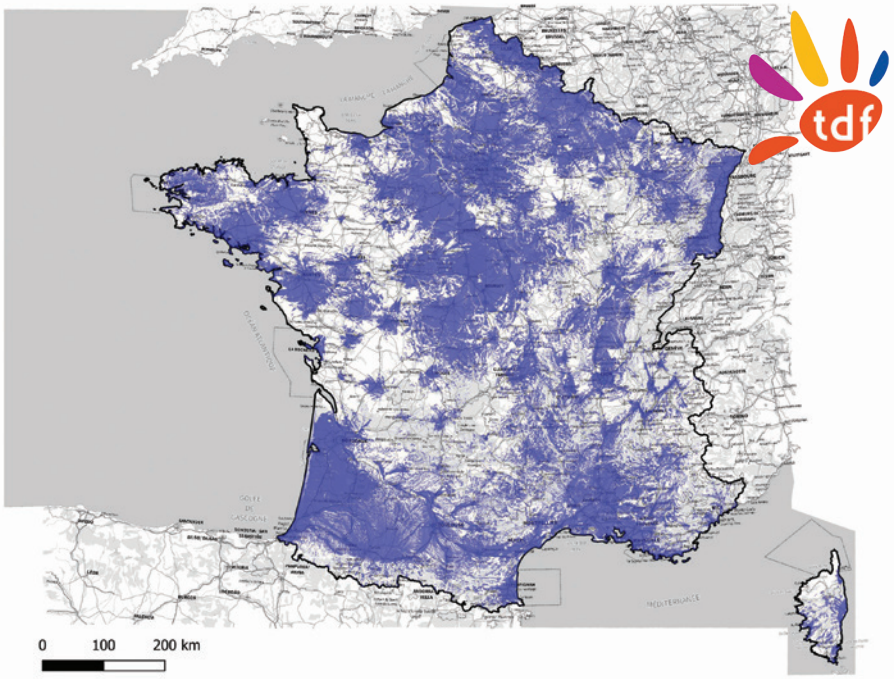
The Paris 2024 Olympic and Paralympic Games provide an ideal focus for the launch of a new era in terrestrial broadcasting in France. France Télévisions' **Jacques Donat-Bouillud**, head of distribution, and **Bastien Thiébaut-George**, project coordinator, set out the ambition.

As part of its public service mission, France Télévisions has chosen to offer UHD (Ultra High Definition) to viewers in France, including the country's overseas territories, on digital terrestrial television (DTT). A pioneer in free-to-air UHD broadcasting in France, the public audiovisual group aims to make France 2 and France 3, its two flagship television channels, available in UHD for 70% of the French population.

With France hosting the Paris 2024 Olympic and Paralympic Games, a century after it last hosted the summer Games, it was clear to France Télévisions that the time was right for launching UHD channels. But our ambition goes beyond the Games themselves, since France 2 will be broadcast permanently in UHD as of the first quarter of 2024. The assumed objective of France Télévisions is, in the long term, that all private and public broadcasters switch to UHD for the benefit of the French population.

THE DTT ADVANTAGE

Four out of 10 people in France watch linear channels on terrestrial networks. DTT covers 98% of the population, is genuinely free, allows regional opt-outs, and is the most energy-efficient way of distributing media channels (LoCaT, the Low Carbon TV Delivery Project found that the energy consumption of one hour viewing DTT is 10 times less than one hour of viewing for streaming[1]). Nowadays, France Télévisions cannot indeed proceed with a project, however ambitious it may be, without integrating the CSR (corporate social responsibility) dimension.



Provisional coverage of the UHD network proposed by network operator TDF

Taking into account the frequencies available across the territory and constraints related to coordination at borders, France Télévisions aims to broadcast the new DTT multiplex from about 200 towers across mainland France and 15 overseas. Although the towers covering the most people will be the first to be switched on, so as to democratize these new channels as quickly as possible, France Télévisions' main objective is to make UHD available to all, in both urban and rural areas.

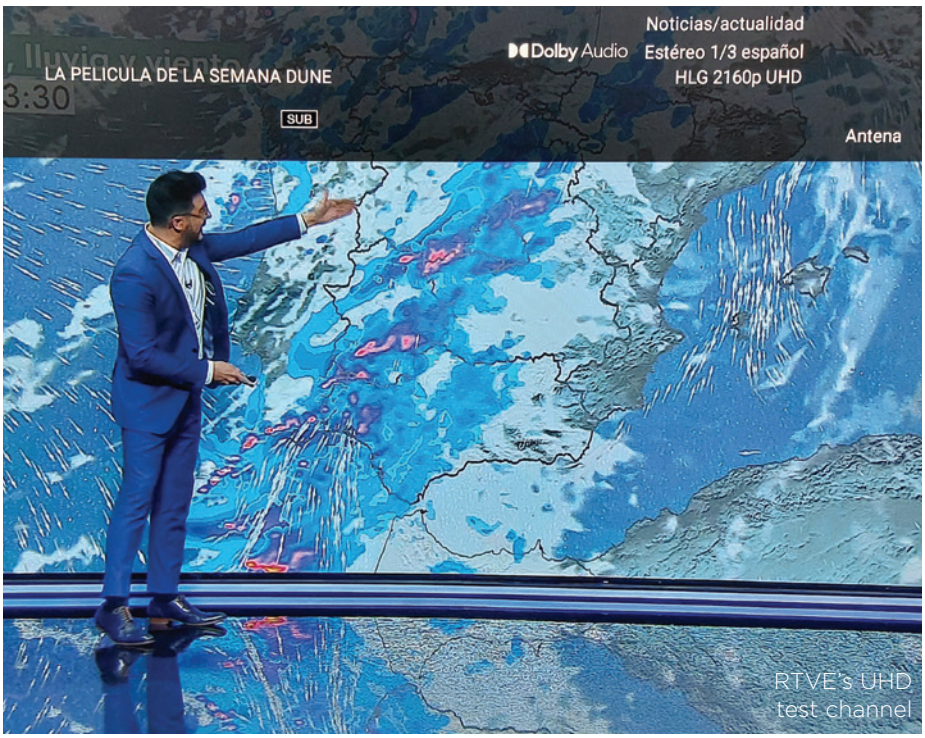
Based on its strong experience with event channels in UHD, and based on the capabilities of the installed base of TV sets in the territory, France Télévisions has chosen the HDR10 2160p50 format, for maximum visual gain. In addition, targeting an improved all-round experience for audiences, France Télévisions will also launch NGA (next generation audio) on its UHD DTT services, with the ambition of improving accessibility for those who are hard of hearing.

SIMULCAST DESCRIPTOR

Simplifying access to the new UHD channels is a primary goal. This will be achieved in part by reusing the "HD Simulcast Descriptor", a DTT signalling parameter that was previously used at the time of the switch from standard definition to high definition. This descriptor will enable compatible TV sets that tune to France 2 on its normal channel number (for the HD version) to automatically show the UHD service. This behaviour, tested in close collaboration with television manufacturers, will be transparent to viewers.

Thanks to its DTT ambitions, France Télévisions advocates for free and sustainable broadcasting, accessible to all.

[1] https://thelocatproject.org/



RTVE's UHD test channel

RTVE takes DTT to the next level with UHD launch

Spain's public broadcaster RTVE will launch a nationwide UHD service on free-to-air terrestrial television in February 2024. **Ángel García Castillejo** and **Javier Sánchez Pérez** describe the steps involved in getting to this point.

It has been a little over ten years since RTVE and Cellnex carried out UHD test broadcasts on digital terrestrial television (DTT) at the Mobile World Congress in 2013. These were pioneering tests at that time, as no one had previously broadcast UHD over DVB-T2. There were not even commercial TV sets that could decode UHD Phase 1 in DVB-T/T2 – it would be a few more years before they became widely available.

Since then, RTVE has conducted further tests, gradually incorporating the features that accompany the higher UHD resolution and improve "pixel quality" to reach UHD-1 Phase 2, with HDR (high dynamic range) leading the way. All of this without neglecting audio, where NGA (next generation audio) has taken over from traditional multichannel sound. These tests have been carried out on platforms that distribute linear television and video on demand. However, the understanding has always been that the top priority for providing public service media via linear television in Spain is through free-to-air DTT, as it is the platform with the highest consumption and provides the widest social coverage.

WORLD CUP TESTS

Since SD (standard definition) DTT channels will be switched off in February 2024, freeing up space in RTVE's multiplexes, we initiated further UHD tests in collaboration with Cellnex last year. We wanted those tests to have relevant content to gain experience, so we took advantage of the 2022 FIFA World Cup in Qatar. In fact, the most-watched television content in Spain in 2022 was the FIFA World Cup final, offered by RTVE on DTT.

Our plan has been to continue with these experimental UHD broadcasts until the SD DTT channels are switched off, with content such as the World Athletics Championships or Spain's matches in the FIFA Women's World Cup last August. The final of the latter gained a large audience thanks to Spain's presence and eventual success.

Nevertheless, conducting UHD tests is quite different to starting a new regular UHD DTT channel with over 98% population coverage. To do this, it was necessary to have the unanimous approval of the RTVE Council of Administration, to provide detailed information to the State Secretariat for Telecommunications and Digital Infrastructures, and to work closely with Cellnex.

FEBRUARY LAUNCH

Having done all of this, and taking advantage of the SD switch-off, RTVE will launch the first free-to-air UHD DTT channel in Spain next February, using the country's most significant consumption platform. It is intended for all citizens, free of charge and accessible to everyone, because this is public service; and because UHD is not only for the IP world and pay-TV. We are also fully aware that it will take a long time before RTVE can offer all its production in UHD, because this entails a sustained investment effort over the years to adapt all our production and regional centres. Therefore, we will begin by offering all the native content that is available in UHD and carefully upscaling to UHD content that is only available in HD, progressively increasing the native UHD content offer.

In any case, we strongly believe in the technological evolution of DTT and our commitment is intended to be long-lasting, as it is the most important platform in Spain in any foreseeable long-term scenario. This is one reason we have advocated for its continuity well beyond 2030 at this year's WRC-23 gathering.

New test chart to help SDR viewers benefit from HDR production

NRK's **Thomas Berglund** explains why and how he created a new video test chart that provides an easy and efficient way to verify signal levels according to EBU R 103.

More and more broadcasters are either testing or already producing live HDR (high dynamic range) video content. While HDR displays are becoming more common, most viewers today are still watching content on displays only capable of displaying SDR (standard dynamic range). Hence, we want to provide the best possible SDR signal when down-mapping live HDR content for SDR displays.

Within a video signal there is a certain amount of headroom above and below nominal video range, 0% to 100%, from black to white. For live HDR production we can use part of this headroom (down to -5% and up to 105%) in the down-mapped SDR distribution signal to achieve even better perceived contrast and some additional detail in highlights. Using part of this headroom also reduces round-trip losses when mixing SDR and HDR content in a live HDR production workflow.

The EBU recommendation R 103 sets out the permissible levels for video signals and specifies the recommended max/min range when using the headroom outside nominal video range. R 103 can appear quite theoretical when you read through it, and it can be difficult to understand how to test whether your signal chain can use that additional headroom, as recommended by the EBU.

Thomas Berglund with the test chart he created

BRIGHT IDEA

I learned about this while attending an HDR workshop organized by the EBU at SWR in Baden-Baden in May 2022. At the time, I found it difficult to understand how to easily verify these video signal levels, but after much research and testing I came up with the idea of creating a test chart that could help make this easier. The main goal was to have something that could be used to verify video signal levels according to the EBU R 103 specifications, to visualize this every step of the way through a video signal chain and figure out where you are potentially clipping your signal. Using the test chart, you can simply monitor the video signal through the different stages of your signal chain and check the signal on a waveform scope. At a glance, you can quickly check on the waveform scope whether you see bars below and above 0-100% and thus know if the signal is clipping or not.

I first tried to create a Python script that would generate the test chart but couldn't get the precision required. I then decided to try using the Blackmagic Design DCTL[1] scripting language from the widely used DaVinci Resolve Studio software. The 32-bit float precision it offers allowed me to get very accurate representations of the specific code values in a 10-bit uncompressed YUV 4:2:2 video signal.

For those who want to analyse the signal in more detail, beyond looking at a waveform scope, the chart is 100% accurate; and the 10-bit code values can be inspected with data analyser tools to check exactly how much of the 10-bit value range is being allowed through the signal chain.

The chart is available for download as a 10-bit uncompressed YUV 4:2:2 QuickTime video file (v210). For those who want to create something customized, the DCTL code is also freely available and fully open source. A video tutorial showing how the test chart is created is available to view on the EBU website.

Video signal levels can be a confusing topic for anybody working in the video post-production or video production chain. Hopefully, you find this information and test chart helpful. I have some ideas for new additions to EBU R 103 to help explain more about how video signal levels are mapped to the display, but that is for another time.

*Visit **https://tech.ebu.ch/publications/r103** for more information, links to the test chart and other resources.*

[1] DaVinci Color Transform Language

With their new mounts, the retro lenses offer visual appeal and easy handling

SVT tech expert Billy Björk is the innovator behind the "vintage kit"

Magnus Carlsson modifying adapters to mount vintage lenses on modern cameras

Giving old lenses a new lease of life

The production technology team at SVT has developed a means of bringing vintage equipment back into everyday use. **Julia Kjaergaard** explains how this cost-effective and sustainable solution came about.

At SVT, Sweden's public service television broadcaster, 50-year-old camera lenses have been modified to fit modern Sony FX cameras, a move that benefits both viewers and SVT with high-quality cost-efficient film productions. Creativity, dedicated craftsmanship, and an interest in vintage equipment sparked this surprising development.

RETRO TECHNOLOGY

It all began with a setback, when a lens mount adapter for SVT's Sony cameras didn't work. But instead of simply exchanging it for one with the correct size, Billy Björk, a member of the SVT technical department, explored a different route. As an experienced photographer and cinematographer who is into vintage gear, Billy was sure there were a lot of creative solutions out there. He found what he was looking for in SVT's collection of retro technology: a complete set of camera lenses. The discovery led to the solution of modifying adapters to mount the vintage lenses on the modern cameras.

Billy contacted Magnus Carlsson, who works in SVT's mechanical workshop. Together, they tried various approaches and created an adapter that made it possible to recycle lenses – the oldest being from the 1970s – so they would be fully functional on modern Sony FX cameras.

The "vintage kit", as it's known at SVT, delivers images that are described as vibrant and organic, soft yet sharp in focus. The craftsmanship of these vintage lenses is generally high, they rarely contain plastic, and they give the footage an elegant cinematic look. Plus, all this finesse doesn't come with a hefty price tag. And the vintage kit has become incredibly popular with the camera crews at SVT.

THREE ADVANTAGES

Recycling 50-year-old lenses provides three important advantages: stable and robust quality that rarely requires repairs; financial benefits, keeping costs down by recycling old inventory; and an end product appreciated by photographers and audiences alike. SVT gets more for its money while being environmentally responsible – a win–win situation!

A little over a year has passed since the in-house vintage kit was launched. The project has been highly successful, and the vintage kits are always in demand for various television productions.

Now, more vintage kits are planned. But the number of retro lenses at SVT has begun to dwindle, so Billy Björk and his associates are looking into the second-hand market.

"There are so many top-quality retro lenses out there, both online and in bricks-and-mortar niche shops," Billy says. "These lenses have certain properties to begin with, and even if a 'cinematic expression' is something of a fad, the gear itself will be durable and SVT will be able to use it for a long time."

Why TEMS is worth a closer look

The TEMS consortium aims to build a resilient data-driven ecosystem in the media sector. **Véronique Demilly** (France Télévisions) explains why media companies should pay attention.

As a telecommunications engineer working in the audiovisual sector for over 20 years, mainly in the technical field, I have observed that we are not always able to make full use of our data. One set of data is usually collected or created and intended for one use only. If you need it for another use, you must put in place process to adapt it. There is no interoperability: *one dataset, one use*.

I have also seen cases where a set of data that would be extremely useful for a specific application was not correctly stored, once it had been used. It was therefore difficult to retrieve it and sometimes even necessary to recreate the data from scratch: *one dataset, used once*.

The broadcast sector and more generally the audiovisual sector have been faced with a new challenge in recent years: the emergence of a large number of new partners. These range from new platforms, on which you must make your brand visible, to new subcontractors to support the development of AI skills. For each new partner, it is necessary to undertake a technical project to connect systems and to begin to work together: *one partner, one project*.

This is no longer sustainable. It's a matter of operational efficiency and even of financial efficiency.

That is where TEMS comes in.

Véronique Demilly speaking at the recent launch event for TEMS in Bilbao, Spain

INTRODUCING DATA SPACES

I discovered the concept of data spaces thanks to the Gaia-X initiative. A data space is a distributed system defined by a governance framework that enables secure and trustworthy data transactions between participants, while supporting trust and data sovereignty. A data space is implemented by one or more infrastructures and enables one or more use cases.

As per Francesco Bonfiglio, former CEO of the Gaia-X international association, in a data space, you connect once, and you can access large amounts of data from various stakeholders. This is exactly what we need in order to break down data silos.

One of the main objectives of a data space is to facilitate data holders keeping control over their data and making it easily usable by different systems.

As far as the content production ecosystem is concerned, the first pitfall to be eliminated is the loss of data – in our industry we usually refer to *metadata* – during the production process. These metadata shall then be inextricably linked to the audiovisual work and thus easy to retrieve. Not only shall they be linked but they shall also be qualified: metadata are stored only if the appropriate person created and verified them.

All data and metadata shall be reusable, exploitable and finally exploited, with the generated value falling mainly into the pocket of the data owner.

Of course, once you have qualified data associated with an audiovisual work, you can imagine and create new ways of exploiting it. It is possible to improve visibility and findability or retrievability, combat piracy, and many other use cases.

Finally, generative AI must not make money on the back of results from algorithms trained on our data, on our content, without sharing the money with European rights-holders and creators. I am increasingly convinced that a secure environment like that offered by a data space can help track unwanted access to data and can control the respect of opt-outs or the contracting of data usage for training algorithms in a win-win manner.

Data spaces are not only about technical interoperability but also deal with automated contracts, clearing-house services, automated compliance checks, new business models, trustworthy governance, and more. This is what you can expect from TEMS.

See: ***tems-dataspace.eu***

tems
trusted european media data space

Innovalia Association

DEUTSCHE TV-PLATTFORM

From the industry – for the industry

For more than three decades, Deutsche TV-Plattform has been shaping relevant industry trends in order to create value for its members and the market, writes CEO **Andre Prahl**.

If there is one constant in our industry, it is continuous change. Technical innovations, new distribution channels and new devices are creating opportunities for innovative business models, but also increase the technical complexity for the production, distribution and reception of content, which must be technically organized and handled. Wouldn't it be wonderful to have an industry forum that brings together experts and decision-makers from all sectors on these topics, acts as a hub for discussion and information, coordinates different interests, and actively drives projects forward in working groups and task forces?

Well, this forum has been around for more than three decades now: Deutsche TV-Plattform. More than 50 members are active in our association, including private and public broadcasters, streaming companies, manufacturers, internet companies, infrastructure operators, service and technology providers, research institutes and universities, federal and state authorities.

Like no other institution for media topics, Deutsche TV-Plattform thus brings together experts and decision-makers from all segments of the value chain – and not only from Germany, but now from all over Europe. Our goal is to actively shape the relevant industry trends in order to create significant added value for our members and the market. After the digitization of distribution channels, topics such as IP distribution, FAST, content discovery, metadata, addressable TV, the use of AI and many other innovation topics are on the agenda today.

Andre Prahl is CEO of the Deutsche TV-Plattform

CREATING VALUE

We are working on these topics primarily in three active working groups at present. The Media over IP group deals with the transformation of the distribution of media content via hybrid and converging infrastructures. The current focus here is on the use of clouds, the shift from broadcast to broadband and especially the new DVB-I standard. The Smart Media group has many aspects of smart services and devices on its agenda and is looking at new technologies and standards around personalization, content discovery, AI in the media, digital forms of advertising and regulatory framework conditions. The Ultra HD working group deals with the production and reception of UHD HDR content as well as distribution via broadcast, HbbTV and streaming.

If particularly important topics emerge in the working groups, they are dealt with in special task forces. This results in expert publications with great value for our members and for the industry, for example on DVB-I, CI Plus+ 2.0 or ADB2.

Our international Plugfest series is also a prime example of how Deutsche TV-Plattform creates value. Since 2014, test results from the Plugfest events have continuously contributed to development work. We also keep up with new trends here: the scope of topics now includes HbbTV, streaming, immersive audio and DVB-I, in addition to traditional UHD tests – with great success. With more than 70 participants from 30 companies, the Plugfest 2023 in cooperation with DTG UK and the HbbTV Association was the biggest event of the series so far.

Beyond practical relevance, we also take care of the big picture and have created an interactive event format for this purpose with the Media Innovation Platform. It goes beyond just presenting, with workshops and demo areas, thus enabling in-depth discussion of important future topics and making them 'tangible'. This year, for example, we took a close look at what role broadcast and broadband will really play for the media industry and viewers in the future and examined the transformation of media distribution from broadcast to broadband in all its facets along the entire value chain.

There are many highly exciting and challenging tasks ahead for the entire industry. We cordially invite you to successfully shape them together with us.

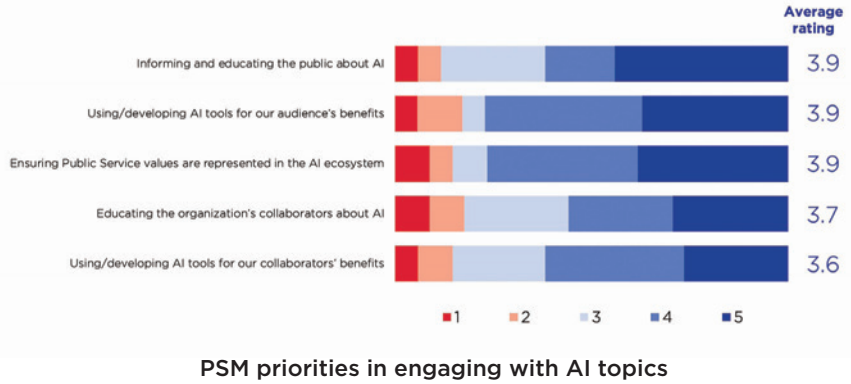
See: ***tv-plattform.de***

Public service media work to develop values-driven AI

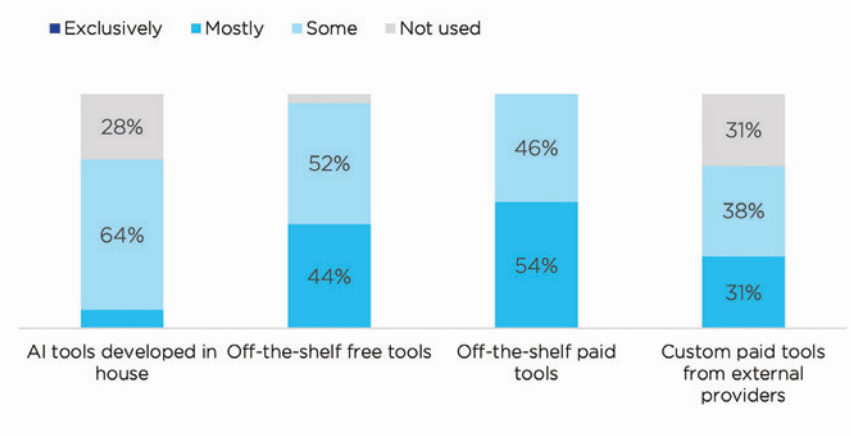
PSM organizations are shaping up to seize the opportunities offered by new AI developments, keeping their values at the heart of their efforts, according to the EBU Media Intelligence Service's "PSM and AI" report, writes **Léa Hermen**.

From late 2022, starting with OpenAI's release of ChatGPT, a wave of new 'generative AI' tools – tools able to generate text, image, audio and video content – propelled the wider topic of artificial intelligence to the forefront of public consciousness. This was in the context of recent growth in corporate investment in AI, reaching US$ 276 billion in 2021. Beyond the generative kind, AI technologies had been used across a range of industries for some time: according to McKinsey & Company, 55% of businesses worldwide had adopted AI by 2023.

The rapid scaling of emerging technologies brings numerous economic, societal and ethical challenges. In the case of generative AI, this also amplified debates already unfolding internationally around providing a legal framework, chiefly the EU's AI Act.



PSM priorities in engaging with AI topics (1 = not important at all, 5 = very important)
Source: EBU based on Members' data (ad-hoc survey), including 34/35 organizations



Types of AI tool used by PS (in % of PSM that use AI)
Source: EBU based on Members' data (ad-hoc survey), including 25-27 organizations

PSM AND AI

PSM, as organizations with technical, creative and ethical stakes, want to seize the opportunities of AI and address its challenges. According to our survey of 37 organizations, 88% of PSM expect AI to feature in their corporate strategy within five years, and over half will make it a top priority. PSM's engagement with AI is driven by serving audiences, empowering collaborators, and infusing the AI ecosystem with public service values. Most cite transparency and preserving human control as key guiding principles.

Nearly three-quarters of PSM already use AI, mostly for content enhancement (translation, speech-to-text…) and recommendation. Other applications actively explored include generating stand-alone content, creative development, and the automation of technical production. A shorter-term priority for EBU Members, however, is to draft guidelines for how AI is to be used by the organization: 70% have issued or are working on such a document.

Collaboration is central to PSM's engagement with AI. For more than half of respondents, their AI strategy is coordinated by staff across several departments. PSM also strive to integrate within a wider AI ecosystem: half of PSM that use AI have partnered with a university; others collaborate with companies or research organizations. AI projects are rarely limited to technical specialists, often involving people in content-related positions or support functions. In 72% of PSM, only a small minority of AI project collaborators are fully dedicated to those projects.

The above insights are drawn from the recently published EBU Media Intelligence Service "PSM and AI" report. See: ***ebu.ch/publications/ research***

IN THE SPOTLIGHT

Kazim Pektaş

CHIEF ENGINEER,
STUDIO PLANNING AND
PROGRAMME TRANSMISSION
SYSTEMS, TRT

Kazim Pektaş is a member of the EBU Technical Committee

WHAT ARE YOUR CURRENT RESPONSIBILITIES?

I focus mainly on the design of studios and control rooms, video and audio infrastructures, and defining technical specifications and test processes. I advise our head of department on technical infrastructure and opportunities to revise our workflows based on innovative technologies, while also guiding younger colleagues in my areas of expertise. In addition to being a member of the EBU Technical Committee, I am vice-chair of the Technical Committee of the Asia-Pacific Broadcasting Union.

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

Having started at TRT as a maintenance engineer in the last days of analogue systems, in my 25-year career I have taken an active role in the project design and installation of many television studios and master control systems, making significant contributions to the digitalization of our organization. As an engineer, my finest achievement is to make my own mental digital transformation policy sustainable and to approach today's complex problems with tomorrow's solutions.

WHAT ARE YOUR PREDICTIONS FOR MEDIA TECHNOLOGY IN THE FUTURE?

Technology for media content production is like a mine that is growing at an incredible speed every second, containing countless elements and substances, some highly valuable and some worthless. As this mine becomes more complex, advanced refining methods will be needed to obtain maximum benefit. In this refining process, which seems impossible to achieve with human labour, advanced and well-trained AI models will be needed.

When it comes to distribution, transmission/communication paths with much higher bandwidth will be needed to deliver higher quality and immersive content to the end user, taking visual and auditory comfort levels to the next level. This will make the telecom industry one of the most crucial stakeholders in the media ecosystem.

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

If we compare the media ecosystem to an orchestra, it is essential that people and technology should work in perfect harmony for our continued success. This may require modifying or completely changing our organizational culture. We must create teams that can quickly adapt to a media world that will be dominated by game-changing technology revolutions.

As public broadcasters, another issue we need to consider is to make new generations aware of us and to stay in their world. To achieve this without compromising our basic responsibilities, we need to listen to and understand them more than ever. We should try to hear and analyse even their whispers in the social media universe as much as they allow. This will leave us with massive data sets to process and use to fuel our decision making.

By doing so, we can integrate their valuable opinions with our own and let them perform their own compositions in our orchestra whenever and wherever they want. In this way we can continue to be a part of their world.

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

Sharing my happiness and my time with my family and friends is the main thing that gives me pleasure. When I have time to myself, I choose to spend it alone in nature, to hear the sound of silence and help my mind rest. I enjoy listening to my favourite songs in my own voice and am also interested in the world of poetry.

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