TVBEUROPE

Intelligence for the media & entertainment industry

FUTURE

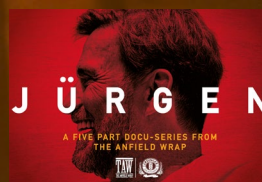# THE AI PRODUCTION
REVOLUTION

FROM CHATGPT TO DE-AGEING HOLLYWOOD LEGENDS

The latest in breaking news

JÜRGEN
A FIVE PART DOCU-SERIES FROM
THE ANFIELD WRAP
TAW

Documenting the life of The Normal One

Is the future now?

A couple of weeks ago, I read an article about how researchers at Standford University have developed a generative artificial intelligence model that can choreograph human dance animation to match any piece of music.

Key to the programme's advanced capabilities is editability. The researchers say that it could be used to create computer-animated dance sequences by allowing animators to intuitively edit any parts of dance motion.

The technology is called Editable Dance GENeration (EDGE) and is described as being similar to other generative artificial intelligence models for images and text such as ChatGPT and DALL-E.

Obviously, there are a lot of concerns about the use of AI generally, and how it will impact our industry and others. However, it is going to be a big part of the media tech industry as we move forward. The idea of AI and robots has always been something that we'll get to in the future, but it feels to me that we're now at the start of that journey and I'm intrigued to see how it continues.

Coincidentally, AI is a focus for us in this issue. I'm delighted to welcome Neil Maycock to the *TVBEurope* team, with his first column looking at what generative AI could mean for technology vendors. We also find out how AI is helping to bring the likes of Elvis Presley back to the screen.

"Artificial intelligence is not new to the media industry, but this new generative technology seems to have caught everyone's attention"

Generative AI has become a buzz phrase in the media technology industry in the first half of 2023. In the run-up to NAB, *TVBEurope* reported on a company using ChatGPT to create metadata, while IBM recently employed artificial intelligence to generate commentary of this year's Masters golf tournament for the event's official app.

Artificial intelligence is not new to the media industry, but this new generative technology seems to have caught everyone's attention. I'll be honest, I expected to hear more about it while I was running around the show floor at NAB, but I expect it's going to be a big topic of conversation come IBC.

Away from AI, live news production continues to be an integral part of the media industry and we hear from both Sky News and Sky Sports News about the technology they employ to bring viewers the very latest, whether that's breaking political news or the latest Premier League manager sacking.

We're also celebrating the winners of our Best of Show Awards at NAB 2023. One of my highlights of attending any trade show is handing out the awards, everyone is always so happy to see me! I'm already looking forward to doing the same at IBC in September. ∎

JENNY PRIESTLEY, EDITOR
@JENNYPRIESTLEY

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ARCADIA®
Central Station

POWER UNLOCKED

FreeSpeak II   FreeSpeak EDGE®   HelixNet®

Integration of wired and wireless

Flexible & Future-Proof

Hybrid Workflow

Dante®
AES67
Speaks Dante

Easy to Use

HelixNet Integration

InfoComm Booth 3854

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AI, David Bowie, and the next Steven Spielberg

By **Neil Maycock**, strategic business advisor at neilmaycock.com

ChatGPT and other AI technologies are grabbing a lot of headlines, and whilst I have been following the stories in the press, it was only recently that I decided to get first-hand experience. What triggered this was a friend highlighting to me that ChatGPT could write software code, which really sparked my curiosity. I started by logging onto chat.openai.com, created an account, and within minutes the results I had ranged between impressive and jaw dropping! My first observation is: do not be misled by the term "Chat", which totally belies the power of this platform.

Like most people, I started with some trivial tests at a conversational level which were interesting, but very quickly I was asking some challenging questions and that's where the experience became impressive. An example test I tried was; "Explain the security features of [company name]'s [product name]". I have to say the result was more comprehensive and easier to understand than the company's website. I've avoided using names here because I think this is genuinely a generic example; whether you use AI to better understand something, or you use it to improve your marketing collateral, the benefit is clear.

My next test was to create some code. I tried a simple test I used in a previous company when hiring software developers, "write some C code to drive some traffic lights with a UK sequence". I had my result in seconds and it was of course flawless. I liked this test when recruiting because there was a good follow-on question, "how would you change this to add a pedestrian crossing?" This caught out many candidates who hadn't written the code well enough to accommodate a change in requirements, but not ChatGPT. After writing the initial code it actually pre-empted this and advised me that a real-life scenario would likely be far more complicated including crossings and other requirements. So much for my first attempt at trying to catch out an AI!

I was left wondering what the implications for the future of software development are for any industry. I'm particularly interested in the implications for creative industries like media and entertainment.

For those of us old enough to have worked through the early days of the internet, almost nobody predicted the massive socioeconomic impact we're now experiencing with social media. With Web 1.0, the focus was on basic e-commerce, funky domain names, and getting low-resolution, low-frame-rate video onto a PC. There were a few exceptions. I like an interview David Bowie gave in 1999 (Google "Bowie impact of the internet"). I think he was close in his prediction and with his description of "exhilarating and terrifying". This description feels very appropriate for the current AI revolution. More on Bowie later…

After my initial experience I did more homework. There is already a vast array of tools available online for generating content, text to image, text to video, video editing, the list goes on. My experimenting with some of the tools allowed me to generate a video, with a virtual presenter, narrating a perfectly timed script written by ChatGPT, using imagery generated by another AI. What you can do with these tools, and very little talent, is absolutely incredible!

What does this all mean for our industry? Will AI applications takeover creating the content we watch? Also, what does it mean for me? I wondered, do I have a new superpower that means I could become the next Steven Spielberg? I don't think so, not with the capabilities we're seeing evolve today. Why? We need to take note that this software is called 'generative AI'.

I can generate content using AI, but my efforts will ultimately be limited by the fact that AI tools and I are using knowledge of what has gone before. The vast repository of information that is the internet means AI can draw on material to create content that no human could. To put it into music terms, I am likely to create a mediocre cover band, the combination of my talents and AI tools don't have the artistic creative spark to create Ziggy Stardust and generate new genera of music and style.

After a brief, but fascinating foray into the world of AI, my initial conclusions are: will AI change our industry? Without question, and in ways we don't yet understand. Will AI make humans obsolete? I don't think so, they are massively powerful tools, but will generate the best results when driven by genuine human creativity. Steven Spielberg can be reassured, I won't be challenging him any time soon!

Finally, should you be using AI in your business? Absolutely! If you haven't already then start today. ∎

The importance of making 6G experiences human-centric

By **Chathura Sarathchandra**, senior staff engineer, InterDigital

Many metaverse-like applications already exist. Social media is a kind of metaverse with a digital identity that you can use to explore the internet. Online gaming, including massively multiplayer online games (MMOs), are probably the most entertaining kind of metaverse. However, the metaverse that we're all waiting for is a virtually connected ecosystem that we can all inhabit, and that is representational of our physical environment.

Teasing several new advancements in virtual reality (VR) that may lay the initial foundations for realising the metaverse, is 6G. What will drive this generation is the introduction of haptics and real-time, high-quality collaborative video experiences; something VR has struggled to get a handle on. But what does a high-quality experience look like? Is it a more comfortable headset? Is it the ability to 'touch and feel' inside our virtual worlds? Or, is it the ability to interact in near real time with other occupants? If extended reality (XR) technology is meant to be the doorway to the metaverse, we need to make sure that door opens easily.

Representing more than just 'faster 5G', 6G brings 'sensory capabilities' that are expected to include more complex analytical insights, distributed control over more connected objects and, not least, an expanded range of digital-human interactions. Unlike 5G, it will manage the complex co-dependencies between chipsets, devices, applications, platforms, networks, and a range of synergistic technologies, such as haptics.

AVOIDING INDUSTRY HYPE

Marketers became far too excited by the potential of delivering high speed experiences which led to 5G being oversold to the general public and the enterprise market. Broadly speaking, as more users begin to experience 5G, the experience falls flat as they see little change except for a little more speed.

Looking at XR for example, mainstream adoption requires the technology to facilitate both augmented and virtual reality and the coordination of the experiences together in real time. Current 5G network technology is simply too slow to achieve that level of latency requirement.

Current 360-degree 4K video requires data rates of 10-50 Mbps, next generation 360-degree 8K demands 50-200 Mbps, far beyond what 5G can currently deliver. If we then consider XR and full immersive experiences, which require 200 Mbps to 5 Gbps, it's not long before 5G reaches a breaking point and fails to meet consumer expectations.

For the next generation of wireless and video to have a greater impact, it's important that we learn from the lessons of the past and define what a 'high-quality experience' is. This means moving away from industry jargon and focusing on what matters to users by delivering a user-centric approach and ensuring that it delivers tangible benefits in terms of latency, reliability, and user experience.

FOCUSING ON THE USER EXPERIENCE FOR SENSORY 6G

Good digital experiences are now a mass market expectation. Quality of experience has become more important than price in making consumers, and enterprises, loyal. This is why when we look at 6G we focus on its impact on human senses.

Researchers from Omdia and Carnagie Mellon University explored how users interacted with XR experiences to outline where the drawbacks from XR came from as well as where users experienced the most enjoyment. This led to the development of a three-layered framework for 6G to deliver high quality experiences.

An infrastructure layer considers network and rendering capabilities for the devices and software; 6G will need to meet the expectations and bandwidth requirements to avoid lag and provide an appealing visual, audible, and tactile experience of users. A consumption layer considers the access to experiences in terms of format and device; ease of access makes for the best route to entry with devices that are not too large or clunky. A human layer considers mental, physical, and perceptual factors which include neurological impacts, physical safety, and the perceptual degrees of immersion whereby the environment is either realistic or at least visually stimulating to engage in.

A HUMAN CENTRED APPROACH TO SUCCESS

Consumers have been moving toward sensory 6G for decades. The access of technology has conditioned consumers to rely on digital sensory interaction and we've seen that when the UX is good, humans adopt physical actions intuitively; actions like swiping left or right or and pinching and dragging images on touch screens have become entirely natural movements.

Connected virtual ecosystems will open a door to a new world of experiences. However, if the industry gets ahead of itself and does not consider human-centricity as a requirement when developing technologies, it runs the risk of users losing interest and investment, both key factors which are vital to its long-term adoption and ultimate success. ∎

Transforming video streaming with GPUs

By **Max Owen**, director of sales engineering, EMEA, MediaKind

Nearly 64 per cent of the world's population is on the internet, which adds up to around 5.16 billion online out of 8 billion in total, a number that increases by the minute. Expectedly, internet usage also went up by 1.355 per cent from 2000 to 2023. Global internet traffic volume was estimated to be around 150 exabytes per month, more than 80 per cent of which was consumed by video traffic, due to a demanding audience who continue to expect nothing less than best-of-quality streaming at zero latency.

Broadcasters have to meet and even surpass these expectations, while at the same time complying with climate regulations that demand 'greener' streaming. The industry is keenly aware that the carbon footprint of streaming must decrease. The use of artificial intelligence for video compression is also increasing the need for higher processing power.

To balance and meet these diverse sets of needs, the industry can look to tap the new and innovative lines of GPU-acceleration encoding cards that are set to achieve the holy trifecta of video creation: superior broadcast quality, significant cost reduction, and highly improved ESG (environment-society-governance) scores.

MediaKind previously ran tests that have delivered up to 70 per cent energy savings compared to CPU-based encoding technology. Results comparing a 48-channel CPU-only deployment vs a GPU-based server deployment reduces the total cost of ownership (TCO) by up to $200k over five years. This also saves over 50 tonnes of CO_2e; the equivalent of flying from Paris to New York 100 times.

A GPU-based solution is a triple win for companies since it significantly lowers operational costs, energy consumption, and capital expenditures while keeping high standards in important areas like rack density and image quality. It presents a strong business case for customers who want to accomplish sustainability targets without sacrificing even the slightest bit of performance.

WHY A GPU IS THE BETTER 'GREENER' OPTION

Typically, video encoding consumes up to one-third of the computing power in a typical data centre, making it one of the most power-hungry operations. For the media and entertainment industry, maintaining a balance between high-performance standards, controlling prices and carbon dioxide emissions, has proven extremely difficult.

Our own technology, for example, is tackling this issue head-on: optimising energy usage and reducing emissions during the video streaming process, thereby enabling considerably 'greener' video creation.

To understand why GPU video encoding technology is superior to CPU-based encoding, we need to first understand the primary differences between a CPU and a GPU.

A central processing unit (CPU) is a generalist component handling all the main functions of a computer while a graphics processing unit (GPU) is a specialised component that excels at running multiple smaller tasks simultaneously. Given GPUs have many more cores than CPUs, they can handle many more concurrent mathematical and geographical calculations with greater efficiency. This means that GPUs are better suited for complex processing tasks such as video encoding, where many small tasks must be completed in parallel.

GPU-accelerated computing, i.e. the employment of a GPU along with a CPU, facilitates a higher quality of video playback using accelerated effects and transitions in real time without having to render them separately. The end product is far superior than sole CPU-powered ones.

'GREENER' VIDEO OPERATIONS: HOW TO REDUCE COSTS

The server's primary CPU(s) can now be used for more general workloads thanks to GPU video encoding technology, which also offers up to 70 per cent energy savings over CPU-based encoding.

In addition to the test results comparing a 48-channel CPU-only deployment vis-à-vis a GPU-based server mentioned earlier, it was also found that the technology achieves reductions of about 65 per cent for the encoding servers, making it ideal for businesses looking to optimise their data centre infrastructure. Using less power – the equivalent power per channel metric was as low as 13W for an IPTV HD channel (30FPS) and 78W for a UHD OTT profile (60FPS) – reduces cooling requirements and associated costs as well.

GPU-based solutions fully support the H.264 and HEVC codecs and do not require any complex implementation for customers to deploy them. Companies can bring their own servers, so there is no reliance on bespoke hardware either. The solution can be deployed on their own servers, and the channels can be managed from the same interface with the same licensing model.

To conclude, we can see that environmentally friendly video encoding is essential for the sustainability of the streaming industry. Graphics processing unit-based video encoding technology offers the ability to reduce the carbon footprint of video streaming while also providing significant cost savings for content providers. ■

#ICYMI

TVBEurope's website includes exclusive news, features and information about our industry. Here are a few of our recently featured articles...

SORTING THE SOUND OF A SORT OF HOMECOMING

With a hard TX deadline of St Patrick's Day looming, the sound editing and mixing team at Levels Audio had only a few weeks to complete their work on Disney Plus' new documentary about U2 co-founders Bono and The Edge.

https://bit.ly/42hfyD2

HOW BROADCASTERS PREPARED FOR THE CORONATION OF KING CHARLES III

TVBEurope spoke to Sky News, TalkTV, PA Media, the European Broadcasting Union and Austria's ORF to find out their plans for covering the coronation of King Charles III and Queen Consort Camilla. ■

https://bit.ly/3Vumbzz

WE HAVE A RESPONSIBILITY TO NOT JUST DEMAND CHANGE FOR THE SAKE OF IT
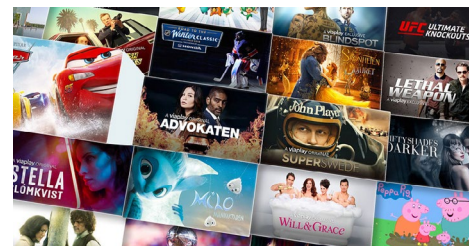
Lena De Geer, head of sustainability at Viaplay Group, tells *TVBEurope* of the company's aim to become one of the world's most sustainable, diverse, and inclusive entertainment providers. ■

https://bit.ly/44sjBhV

NEW REPORT DESCRIBES VVC/H.266 AS 'STANDOUT CODEC'

A new report spotlights VVC/H.266 as a standout video codec with a highly versatile design for use across an extended range of applications and capabilities far exceeding those of previous standards. ■

https://bit.ly/3LRmhhN

TALK(TV) OF THE TOWN

TalkTV recently relocated its entire production capacity to owner News UK's newly expanded studios in London Bridge. The channel's creative head, Erron Gordon, tells *TVBEurope* about evolving show formats and his desire to move away from virtual studio sets.

https://bit.ly/3HEi3HF

HOW GOOGLE HAS TAKEN OVER MEDIA TECH

Robert Ambrose, co-founder and managing director, Caretta Research, looks at how Google has soared past long-established players to become the biggest vendor by far in the media tech industry. ■ #

https://bit.ly/3noqdNo

BEST OF SHOW

Best of Show 2023 TVB EUROPE WINNER

A selection of this year's winners pose with their awards

Future's Best of Show awards programme at NAB 2023 offered the latest glimpse into the R&D efforts of technology providers across the broadcast space; the quality of entries proving that industry innovation is alive and well. Here, we profile the winning entries in the *TVBEurope* category

7Mountains Dina Mobile

Software company 7Mountains have released a new version of the newsroom app Dina Mobile. Dina Mobile fills the gap for journalists and storytellers on the move, allowing them to create and publish stories in the field, with a live link into the newsroom to track schedules and control when a story goes live. Dina Mobile includes features such as: Upload media content to news stories, create stories, edit, take photos and videos and publish from anywhere, engage and communicate with the newsroom with a range of new chat features, get push notifications for story assignments, monitor news rundowns to see what is on air, a countdown and more. Users can upload media content to news stories, write, edit, add photos and videos, and publish stories from the palm of their hands.

With Dina Mobile, journalists and storytellers can swap between the newsroom web interface of Dina and the app for their story creation, planning and publishing to linear/live shows, LinkedIn, Twitter, Facebook, web CMS systems, and other destinations, as well as collaboration and communication with using chat.

With the newest update to Dina Mobile unveiled at the 2023 NAB Show, the communication experience reaches a new level. The app users can chat 1-1, in groups, teams, and departments. Users can also engage in chats connected to a specific news story and a newsroom rundown.
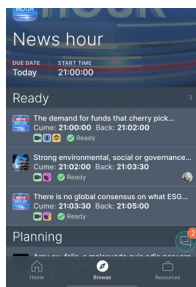
Appear Hardware accelerated SRT video transport for X Platform

The continuous growth in penetration and increased bandwidth capacity of unmanaged internet networks has unlocked the possibilities of transporting broadcast quality video over the Internet. The Secure Reliable Transport (SRT) protocol is presently the media industry's favoured open standard solution for internet video transport. The real difference that SRT has enabled is in the exponential growth in the potential use cases for delivering video over the public internet. We're talking to customers right now who are looking at using SRT to transport large groups of live channels over the public internet using SRT. However, until now, the available SRT solutions have had limitations in terms of capacity, density, and flexibility, hindering the take-up of SRT in professional video environments.

SRT solutions have historically been provided through servers. This approach worked when moving one channel or covering a live event with a small number of cameras. However, due to the cost-savings of the public internet and the simplicity of operation of SRT, the potential use cases for the SRT protocol widened. It became apparent to Appear that media and entertainment companies needed SRT support in robust, high-density, flexible carrier-grade solutions that interoperate with existing broadcast workflows.

BB&S Lighting Reflect 4-Bank System

The new Reflect 4-Bank System was created in response to LDs lighting sets as well as newsrooms who have requested the colour rendering and longevity benefits of remote phosphor technology in ultra efficient, lightweight fixtures that fit grids and walls. BB&S remote phosphor LED technology has been proven to provide consistent output for over ten years.

With convenient rectangular form factors and flat profile, they fit right into a multi-lamp reflector bank or grid, offering extreme efficiency and high output (60 lux at 10/feet) coupled with consistently high colour rendering of 95 TLCI, and the stable, colour shift-free output that remote phosphor is known for.

These lights meet all the critical specs for newsrooms requiring extreme accuracy combined with control that's fully dimmable without flicker or colour shift. Reflects offer low power draw (11 Watts/foot), high light output (1100 lumens/foot), 90-degree light dispersion, heatless and fan-less operation. Control is via the new optional 4-Channel Controller with 8/16-bit DMX 512/RDM with internal 48V power supply.

Reflect 2 and 4 Banks' housings are designed using the latest engineering techniques to emphasise efficiency in power and output. Developed as a combined semihard and soft light, their superior reflectors utilise a semihard reflective surface to project a 90-degree directional light pattern.

Bitmovin Smart Chunking

Bitmovin has optimised its Next-Generation VoD Encoder with Smart Chunking, an evolution of the split-and-stitch algorithm which splits the encoding job into multiple parallel encodings or segments, accelerating the entire process.

One of the biggest priorities for media and entertainment companies is delivering streams in the best possible quality, and encoding is fundamental in achieving this. The split and stitch algorithm was a significant advancement in video encoding because it made it possible to horizontally scale the compute intense workload. However, some of the limitations of split-and-stitch are the downside of potential quality drops when using fixed GOPs and segments.

Bitmovin saw an opportunity to solve these challenges and further improve the visual quality of video content, with Smart Chunking, which optimises chunk lengths and bitrate distribution, delivering an improved visual quality throughout the whole asset at an even faster pace than before. To achieve this, Bitmovin decoupled the chunk duration, which allows for variable chunk size depending on the codec type and the encoding complexity, providing the user with immediate and visible improvements.

The immediate benefits of Smart Chunking for audiences are even better visual quality when streaming their favourite content. The data shows a noticeable increase in visual quality that's perceptible to the human eye when Smart Chunking is used compared to the legacy split and stitch algorithm.

Cobalt Digital Sapphire 8JXS-8S

JPEG-XS is a lightweight video compression scheme that combines extremely low latency (on the order of a few lines of video) with good bandwidth savings, when compared to baseband video. Carriage of JPEG-XS over IP networks is defined in SMPTE ST 2110-22 and VSF TR-08:2022. Such JPEG-XS streams can be combined with ST 2110-30 audio and ST 2110-40 ancillary data.

The Sapphire 8JSX-8S is the highest density openGear converter on the market. It can accept up to eight independent input JPEG-XS streams (each with its associated audio and ancillary data essences) and convert them to individual SDI outputs. Up to five Sapphire 8JSX-8S cards can be installed in an openGear frame, for a total of 40 SDI conversions per 2RU. Each Sapphire card has two SFP cages, supporting both 10G and 25G Ethernet interfaces, and optionally ST 2022-7 Seamless Switching. Sapphire is capable of ST 2022-7 Class-C operation, which makes it ideal for use in WAN environments.

For control, the Sapphire 8JSX-8S card includes full support for NMOS IS-04/IS-05, as well as the standard openGear DashBoard management interface. Sapphire 8JSX-8S is the ideal choice for receiving large numbers of JPEG-XS streams over a LAN or WAN and driving devices such as a router or a monitor wall.

The openGear form factor allows Sapphire 8JSX-8S to be combined with other processing in the same chassis, and the high density translates into space and power savings. The primary use for bulk JPEG-XS conversion is feeding large numbers of monitors, in space-constrained environments such as trucks and OB vans.

Haivision Haivision StreamHub

Haivision StreamHub is an extremely versatile HEVC and H.264 video receiver, decoder, and IP gateway bridging 5G and bonded cellular, SDI, NDI, ST 2110, SRT, RTMP, and other IP protocols for on-premise and cloud-based live broadcast workflows.

Broadcast engineers and live production staff require greater flexibility between on-premise, cloud, and remote production workflows that include a hybrid mix of 5G, IP, and SDI video sources and destinations. Haivision StreamHub sets the standard for versatility, reliability, and quality by way of real-time broadcast contribution features, IP and cloud-enabled remote production, and advanced content monitoring tools

StreamHub comes with a flexible choice of configurations, letting the user address any type of workflow from simple deployments to systems requiring high-density HD and 4K video processing across multiple locations, in the cloud, or on-premise. The versatile platform supports industry-standard technologies and protocols, including HEVC and H.264, support for bonded cellular and industry-standard transport protocols such as SRT that expands interoperability beyond Haivision transmitters and encoders to include various third-party sources as well.

Designed to meet the demanding requirements of live sports and news broadcasters, StreamHub receives and decodes multi-camera video streams transported over mobile networks, the internet, and the cloud at very low latency. Each StreamHub can receive up to 16 concurrent incoming SST and IP streams from Haivision mobile transmitters, encoders, and third-party sources.

Mjoll Mimir

Mimir is a cloud-native video collaboration and production platform, with a number of features including live production in the cloud and media asset management. With Mimir, users can access and find content independently of its location. All that is needed is an internet connection. Artificial intelligence (AI) – assisted automatic metadata logging, including ChatGPT – combined with a powerful search tool reduces the time necessary to find the required content for editing projects and from video archives.

Mimir is the tool of choice for anyone transitioning from on-premise to the cloud or looking to modernise their existing media infrastructure and workflows. It can fill the gap of several legacy systems for media ingest, production asset management, media asset management, archive and backup in a cloud environment, a hybrid cloud or even with on-premise infrastructure. Mimir is also a transcoding platform and tool for collaboration, sharing and comments.

Media houses, production companies, news agencies and broadcasters have embraced Mimir for their media cloud archive and backup, AI-assisted automatic metadata logging, video collaboration and sharing, PAM and MAP needs, live feed integrations, and more. Customers include, amongst others, The New York Times, Formula E, Deutsche Press-Agentur, GB News, NRK, and TV 2.

Mimir is created from scratch on cloud technology without the traditional legacy of on-premise, so its deployment update cycle adapts to modern requirements of continuous updates without downtime. Mjoll has certified a range of integration partners for Mimir and support technologies for an enhanced workflow, including NDI support and using ChatGPT to create video content descriptions automatically.

Mimir is available as an example through MOS, iFrame and as a panel in Adobe Premiere Pro, Vimond VIA, and Cutting Room.

Quantum Myriad

Myriad is a new all-flash scale-out file and object storage software platform ideally suited for the evolving needs of VFX, animation, and rendering, and the increasing demand for AI and ML content creation and enhancement tools and new markets such as AR/VR, live production with LED video volumes, and digital twinning.
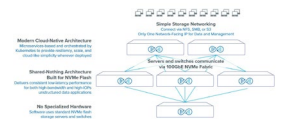
Legacy NAS storage systems provide inconsistent performance, are complex, difficult to scale, and often deployed in islands that add workflow complexity and increased management burden. The slow performance makes rendering a painful and long process.

Instead, Myriad makes full use of readily available NVMe storage and RDMA to deliver the extreme performance (tens of GBps) and high IOPS (thousands) needed for cutting-edge animation and multi-platform workflows without the drawbacks or design limitations of legacy systems. Myriad requires no custom hardware, so as market available NVMe storage servers gain higher capacities, higher performance, and lower cost, they can be used giving flexibility and adaptability as business evolves.

The platform allows users to consolidate multiple animation, VFX, and rendering workflows into a single fast system to serve all departments, clients, workstations and workflows including rendering pipelines and AI and ML applications. Myriad delivers consistent performance for all users and is highly efficient storage for the large number of small files common in these workflows, and for serving rendering pipelines without impacting other users. It is built with cloud-native technologies like microservices and Kubernetes making it extremely flexible and easy to use, no specialised IT or networking experience required, and can be easily deployed on-premises or in the cloud.

Quickplay and VionLabs Preview Clips Integration NewsBoard

Quickplay, a North American based company, and VionLabs, headquartered in Sweden, are bringing together Quickplay's award-winning, cloud-native CMS and Vionlabs' AINAR Visual Discovery solution to create AI automated thumbnails and preview clips. Pre-integration with the Quickplay CMS means that Quickplay customers automatically have access to a powerful new tool to drive customer engagement and long-term value. AI-derived metadata for content moods, micro-genres, story descriptors, keywords, and more are leveraged by advanced personalisation algorithms from Quickplay to:

- Find all the main characters through presence and importance to story;
- Pinpoint exactly where in the frame to feature main characters for thumbnails; and
- Find the best scenes using energy and emotion tracking across the story arc.

AI-automated thumbnails and preview clip outputs are fast and easily created, significantly reducing the cost of content marketing. AINAR Visual Discovery recognises key people in the video and analyses their mood and appearance to evaluate their importance. After analysis, AINAR Visual Discovery can find the main characters for thumbnails and previews and select both engaging and relevant segments of the content suited for promotional material.

Most services have the Catch 22 issue that they don't have any data on new users and it takes time to collect the data. Vionlabs AI generates preview clips (the type of short clips that start when you hover on a movie/series thumbnail on Netflix) that, when combined with metadata and content embeddings, can connect shorter clips to long form content such as movies and series. This helps boost the amount of datapoints available for each user early in the user journey from one or two interactions per week to 50-100 interactions that can be used in recommendations, personalisation, and discovery.

As offered by Quickplay and VionLabs, Preview Clips uses three key AI-based capabilities to enables OTT providers to create previews automatically, without the time and cost of manually marking each noteworthy highlight.

Character Tracking identifies characters and tracks their actions, enabling accurate previews that focus on the main characters in the story.

Action Detection uses a deep learning algorithm to recognise high energy scenes that should be included in the previews, including dynamic actions such as running, jumping, or fighting for an action movie, and funny moments for a comedy.

Speech Detection technology provides an added layer of protection by checking dialogue to ensure that previews begin and end at natural breaks in the conversation.

This results in richer, more nuanced video recommendations and previews that can be targeted to viewers based on data collected by Quickplay tools across the subscriber journey. Previews can be published immediately or 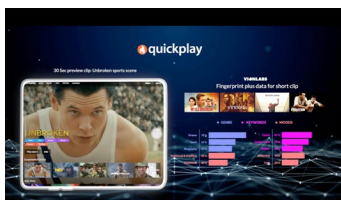serve as the basis for further refinement by the content team, resulting in increased activations across Quickplay customers' OTT content libraries.

As noted above, a baseline of one or two interactions per week can be increased to 50-100 interactions that can be used in recommendations, personalisation, and discovery.

Telos Alliance Jünger Audio AIXpressor

The Jünger Audio AIXpressor combines unparalleled I/O flexibility and legendary Jünger audio processing into a compact, 1RU powerhouse.

AIXpressor natively supports analogue, AES3, MADI, and Jünger's low-latency 1024-channel tieLight, plus Telos Alliance Livewire+ and AES67 in support of SMPTE ST 2110-30 via AoIP. Four expansion slots support additional I/O modules including 3G HD-SDI, microphone inputs with pre-amps and 48V phantom power, Audinate's Dante AoIP, and additional analog, AES3, and MADI sources.

The full suite of Jünger audio processing, encoding, and decoding solutions can be added as needed in the field via license.

Based on Jünger's new flexAI platform architecture, AIXpressor can be used as a standalone processor or employed as part of a larger processing array incorporating other AIXpressor units as well as flexAIserver for high channel-count applications.

To learn more about AIXpressor, please visit https://telosalliance.com/aixpressor.

Teradek Ranger

The average latency for RF-based wireless video transmission is 30.8ms. But the human eye can detect a delay as low as 13ms. That's why we designed Ranger: the only wireless video solution to achieve true zero-delay (<1ms) with visually lossless picture quality, featuring our Emmy and Academy Award-winning zero-delay, 4K HDR technology. Ranger's best-in-class performance allows broadcasters and live production companies to implement real-time wireless workflows over licensed and unlicensed bands, from 4.9 GHz up to 6.4 GHz.

What's new for 2023 is that Ranger now includes 12 additional RF channels over 6 GHz (U-NII 5), providing access to wireless spectrum rarely used by other electronics. And now with two form factors (Ranger Micro and Ranger MK II), users can scale their zero-delay transmission options according to production needs.

With the number of wireless devices on the rise, and a limited amount of frequency bands to choose from, there is little room for signals to move without interference or disruption. But Ranger, offers options: 5GHz for general use, licensed band frequencies for special events, and the new 6GHz U-NII 5 band for 12 new channels of uncongested wireless spectrum.

When a delay in audio and video transmission is noticeable, it's nearly impossible to give viewers a lifelike experience. Ranger's patented zero-delay technology solves this problem. With Ranger, audio and video signals are transmitted with ultra-low latency – even in 4K60 – providing a visually lossless and engaging experience for viewers.

Ranger was engineered for flexibility and cross-compatibility. Pairing any combination of Ranger TX and RX together means users can quickly scale and operate a variety of Ranger systems best suited to the environment, despite differences in transmission range. ■
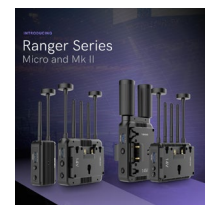
USING AI TO UNLOCK MAGICAL CREATIVE POSSIBILITIES

There's a new trend in Hollywood to use artificial intelligence to de-age actors. **Jenny Priestley** talks to one of the leading innovators, whose technology is being employed in both TV and film

Right now it feels like artificial intelligence is the hot topic in the media industry and beyond. From chatbots creating metadata, to the metaverse and synthetic humans, there are countless ways the technology is being employed. And one of the newer ways is using AI to either de-age or even bring a celebrity back to life.

This month's *Indiana Jones and the Dial of Destiny* uses artificial intelligence to bring a younger Harrison Ford to the screen. Ford has spoken about the process, explaining that LucasFilm used AI to go back through all the films he has made for the company, including footage that's never been seen before. "They could mine it from where the light is coming from, the expression," said Ford. "But that's my actual face. I put little dots on my face and I say the words and they make it. It's fantastic."

Metaphysic is a company looking to bring this kind of technology to a wider audience. Viewers of *America's Got Talent* (*AGT*) have already seen it in action after the company's Chris Ume and Tom Graham showcased the technology on the show. They worked with previous *AGT* finalist Daniel Emmet to make it look as if Simon Cowell was singing on stage. Cowell and the judges were so impressed, Metaphysic made it all the way to the final, finishing fourth.

GOING BACK TO THE START

Metaphysic was formed in 2018, but the company has seen real momentum in the last 18 months. "We have north of 50 employees now," explains co-founder Martin Adams. "We brought in some excellent people, including Sam Head (aka Shamook), who's a bit of a legend in the space. We've really grown out both the tech and the creative team."

Adams has worked in the cultural industries for almost 20 years, including setting up one of the world's first digital transformation consultancies for talent, working with people like Barack Obama, Will Smith, and Hugh Jackman. "I started to understand very quickly the use of data could help them be more effective in their comms and their online presences," he says. "I've always had this schizophrenic background

Artificial inteligence has been used on *Indiana Jones and the Dial of Destiny* **to de-age Harrison Ford back to 35**

between the cultural industries and law and intellectual property. I studied for a Master's at Harvard Law School, which is where I met my co-founder Tom, who's CEO of the business, and I became obsessed with intellectual property because I realised that for modern businesses to create value they didn't need to just make an impact but retain the value of that impact by having intellectual property."

After Harvard, Adams and Graham set up codec.ai together, which uses machine learning and AI to make brands act more like entertainers and produce content that would engage audiences online. The pair partnered with Chris Ume, who famously created @deepTomCruise on TikTok and now has 5.2 million followers, to launch Metaphysic with the aim of using artificial intelligence to create content.

"I've always been interested and committed to using technology to impact culture, which is quite rare. Most technology companies are really about efficiency, and doing things a faster way. Tom and I have always been interested in being able to get a more exciting and magical creative output from using AI," explains Adams.

"It's important to us that audiences are charmed and delighted by what they're seeing and consuming. We wanted to birth a company that would take that technology on to the next level, but build it with ethics and

permission and consent at the heart of the business model, which was and is quite a rare approach."

That means that the Metaphysic team is principally in control of the technology. They work with key people in the entertainment industry, with the current focus on Hollywood and film studios. "We insist upon full and informed consent from them contractually, but also from any talent that they're looking to have the technology applied to," states Adams.

Recently it was revealed that Keanu Reeves has a clause in his contracts that bans studios from digitally editing his performances. "Good on him," says Adams. "It's his data. It's his agency to do that. We would always insist on permission."

HOW IT WORKS

The technology works by training AI models based on captured or existing historic data, which allow a set of human behaviours of an underlying performer to be enhanced with what the model thinks needs to happen to match that person. Or, in simpler terms, a model is created of the talent who have given permission for their identity to be captured. That can be either historic footage or captured live, such as movements and dimensions of their face, emotions, how they smile,

Metaphysic used AI to create a performance by Elvis Presley on *America's Got Talent*

how they might wince, how they might look angry, and all of that information is fed into the model.

"Once you've got the model of an actor, you have an underlying performance, and the technology will fill in all of the gaps," explains Adams. "When the actor is smiling, the AI-generated character will smile in the same way, or when they're frowning, it will do that. The algorithms jump the bridge between the actor and their character in their reactions and performance."

The technology needed to capture the actor's performance can have various degrees of sophistication. "Higher fidelity and more angles are valuable, but it's certainly not restrained to that," says Adams. "On some level, being able to capture it with a phone is helpful. It's not even a total dependency, if you have enough publicly available data of a deceased star or a current film actor or musician, you can capture them just using historical data."

As mentioned earlier, Metaphysic showcased what they could do on *America's Got Talent*, both with 'live talent' and using footage of Elvis Presley. "What's interesting is the technology has got to the point where what you might think would be the hardest thing, such as resurrecting Elvis live on stage, is not the case anymore," Adams adds. "Actually, you're back into traditional business in terms of negotiating with estates making sure you have full permission, making sure they're comfortable with what is happening on stage and that it fits the brand that the estate is trying to uphold.

"To be honest, there's a genuine, unfair advantage on some level that we feel we have in Metaphysic in that we are a mixture of absolute cutting edge, innovative and creative technologists and machine learning

experts, but also that we have the commercial and the legal experience and background to put those pieces together and build innovatively but appropriately and sustainably."

A SEISMIC SHIFT

The technology has caught the attention of Hollywood, and is currently being used at Pinewood Studios on the set of Robert Zemeckis' latest film, *Here*. It stars Tom Hanks and Robin Wright with the actors portraying their characters over the course of their lifetimes. To do this, Zemeckis is employing hyperreal AI-generated face replacements and de-aging into the storytelling, without the need for further compositing or VFX work.

"We're hugely excited to be working with a truly world-class and frontier-pushing director and team," states Adams. "There's an extra special feeling of contentment that comes with seeing maybe the most famous and best actor in the world, Tom Hanks, falling in love with this technology. It's really quite special for us."

Zemeckis is employing Metaphysic Live, a brand new technology developed by the company that live streams high-resolution face swaps for multiple characters in real time. "That means there's no further visual effects or compositing work that's required," explains Adams, "and both the director and the performer can see the results live as the performance is being delivered. The feedback loop allows the actor to perform with more humanity and to fine-tune their performance.

"Robert Zemeckis using it as his primary feed, he's essentially directing from that perspective, which is magic in a sense. You're changing reality, you're actually building a relationship as a director and being able to direct that character live. That's a seismic shift."

AI was also used to create a performance on screen by *AGT* host Terry Crews, and judges Simon Cowell and Howie Mandell

MOVING TOWARDS HYPERREALITY

As well as film production, the technology could be used to take Hanks into the metaverse. "The environments that content sits within are changing and therefore, the content itself will adjust as well," says Adams. "We think those structural shifts will be generally moving towards more personalisable content. So there's kind of another bridge to be built between the performance and the audience member consuming that content. In a simple sense, you can absolutely have Tom Hanks in a powered-up digital environment, performing live, and you have a live synthetic representation of him as a different person or as a different gender or a different age or whatever it might be, playing with all of those variables that are available to us."

"The other piece of the metaverse vision is that the technology that is available to studios now, we ultimately want to put in the hands of normal people," he continues. "We believe that audiences will be powering themselves up into more immersive, more media-rich sort of environments to consume content. We want to give the power to people to kind of capture their identity and control its usage so that they can be on the receiving end of those amazing hyperreal virtual immersive performances that will happen in the metaverse."

If that all sounds very '*Ready, Player One*', then you're not alone. "Reality often follows science fiction on some level," admits Adams. "I hope it will be less violent, and I believe that it will. I think if you stick to the principles that have generally guided society, which is respecting what people own and respecting that it is theirs and giving them some sort of incentive to participate in its usage; if you stick to the principles of informed consent and permission for working with someone's identity,

and your ultimate goal is to enhance the creative industries rather than 'disrupt', then I think you will have a metaverse that is healthy, enriching, educational, and entertaining."

The rate of technological innovation at which the media industry is accelerating, especially around uses of artificial intelligence, is unprecedented. For the team at Metaphysic it's been even faster. As they moved through the rounds of *America's Got Talent,* the quality of the models the team were able to create constantly increased while the time it took them to create those models became shorter.

Asked where the technology will be in 18 months' time, Adams says he would expect to see two things: "Breakneck rates of change in terms of the time to get to hyperreal quality, because of the investments that we are making as a company into proprietary technology. We are building out our own patent portfolio around this. My background, as I mentioned, is as an intellectual property lawyer, so we're taking that very, very seriously."

The second thing Adams expects to see is the audience's hunger to have content experiences within the metaverse or immersive environments. "There's a general willingness to experience things digitally, and so I think that when it comes to consumption of the major entertainment forms of music and film, we'll see both the capabilities and the technology continue to advance at this breakneck speed," he says.

"The direction of travel is categorically towards hyperreality. Too much of the current market is about cartoony representations of these digital experiences. We believe that as the audience and market mature, people will want to get hyperreality in those immersive experiences and that's a big part of our vision, and our investments." ∎

5G AND IP-BONDING: BRINGING THE FUTURE TOGETHER
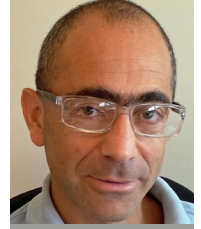
By **Baruch Altman**, head of 5G technology projects, LiveU

There's no doubt that 5G has moved the bar in terms of what's possible using IP-bonding, and has had a very positive effect on transmission from live events, not least because of the increase in bandwidth. We have seen this in both customer experiences and in the trials in which we have been involved. In terms of deployments, the pandemic might have slowed the rollout of 5G networks; 5G deployment depends mostly on the cost combined with ROI, spectrum availability, and special cases like private networks in big stadiums. But 5G is happening and video contribution has started using it.

It started off in specific cities, with 5G radio using existing 4G core non-standlone (NSA), where QoS cannot be guaranteed. Recently, and more so in the future, 5G standalone, having its own 5G core deployed (at a significant cost and complexity for operators) will prevail. Coverage areas will expand, and coverage density will also increase. More bandwidth means higher video quality, and in some cases, higher reliability with the ability to support more devices in the same location (e.g. for breaking news from crowded places). To transmit live from really crowded areas, such as when capturing footage of major national events, or at a Tier 1 sports venue with several tens of thousands of spectators all competing for connectivity, 5G private networks may be deployed to provide the bandwidth needed.

When using any wireless network transmission, reliability is still an issue and, of course, 5G is still wireless. So bonding, using multiple cellular links together, is still the right way to go for reliable high-quality video transmission. How do we know this? Through multiple, in-depth trials conducted by partnering with broadcasters and other technology suppliers, and working on multiple projects to understand the real-world possibilities and the powerful relationship between IP-bonding and 5G.

One of the most talked about possibilities with 5G is network slicing. In essence, this is the ability to provide as high performance as possible, or QoS, to authorised users, end-to-end within the cellular radio and core network with users having a higher probability of receiving the needed QoS for better signal stability on location.

LiveU has been testing 5G with slices for some time now. In 2022, we tested how 5G slices can serve global media remote production. This was carried out with Ericsson and RAI as part of the work the three companies have been doing in the EU 5G-RECORDS project (5G-RECORDS Horizon 2020 grant number 957102), designed to develop, integrate, validate and demonstrate specific 5G components in end-to-end 5G infrastructures for professional AV media content production.

This was a very important, comprehensive set of tests of network slicing scenarios, providing clearly measurable results. The trial highlighted the key role IP bonding will play when it comes to resilient professional production in real-world conditions, including where and when dedicated slices for upload (UL) will be deployed.

Earlier this year, in a first of its kind demonstration, this was taken a step further with leading 5G partners joining forces to trial live video using single and bonded modems transmitted over 5G slices that were automatically and dynamically set up according to real-time analysis. This involved LiveU, LM Ericsson, Nokia, and the University of Patras (UoP), under the Horizon Europe 5G-Solution project (grant #856691).

The questions the trial set out to answer were how these slices can be allocated and managed, and how the 5G cellular operator provides the QoS level it guarantees to multiple broadcasters over a specific slice in a certain location.

One of the technical obstacles to the wide deployment of slices is the static/fixed allocation of resources (spectrum, QoS within the network borders), and dynamic, per-demand management of slice allocation. This has not been automated yet. Hence the theoretical 5G benefits for remote production at scale have up to now not been fully realised.

In this trial, transmitting over 5G slices that were automatically set up

"Using bonding and 5G, coupled with cloud-production tools and workflows, results in additional cost reduction as fewer staff and equipment need to be on-site and remote production becomes a real option"

according to real-time analysis was achieved using several LiveU multi-cam LU800 field units and a network management process called zero touch automation (ZTA). Each unit transmitted up to four independent camera feeds simultaneously by bonding multiple modems, networks or slices. One of these was a slice specially configured for broadcasters' uplink video contribution. The ZTA mechanism dynamically allocated in real-time 5G slices according to LiveU units' transmission needs and the network's overall load.

The ZTA algorithm specially designed by Ericsson, identified, in real time, changes in the network performance resulting from the increased upload demand. It then notified the network management orchestrator (CDSO, by Nokia), which drove the reconfiguration of the network (deployed by UoP) by setting-up a special upload-oriented slice. Modems in the LiveU units automatically identified the newly available special slice, started using it, and LiveU bonding algorithms began transmitting live video packets using this dedicated slice. Bonding this slice with the 'best-effort' slices or commercial networks allowed each of the LU800s to transmit four video streams concurrently and at a high quality, with stable bandwidth and latency. Bonding special slices, in real time, with other modems, networks and bandwidths was instrumental in maintaining video continuity and overall QoS throughout and to reduce the spectrum needed from the new slice.

This trial further demonstrated that even with adaptive ZTA of

dedicated 'guaranteed performance' slice allocation, bonding multiple modems, networks and slices transparently and agnostically is needed so broadcasters can enjoy the highest level of video quality and reliability in these congested areas, under changing conditions and over any network configuration.

Regardless of the future possibilities discussed here, the number of 5G use cases grows again, with sports and high-profile crowded news/one-off events leading the way. Customers are enjoying the benefits, using efficient IP-bonding with 5G with our compact form factor LU300S and our multi-cam LU800, rather than expensive and cumbersome satellite or fibre transmission. Using bonding and 5G, coupled with cloud-production tools and workflows, results in additional cost reduction as fewer staff and equipment need to be on-site and remote production (REMI) becomes a real option. It must be noted that these savings are not only regarding cost but also in reducing the environmental impact, so we're very happy to provide our customers with an end-to-end 5G-to-cloud production option.

Further, audio over 5G and return video (from production back to the camera person or reporter on-site), as our solutions allow, mean tighter, more secure and more reliable communication between the teams as well as virtual audio rooms facilitating easy communications between multiple teams and their director/producer, etc. 5G will play a powerful role in enhancing how we produce content but we're all still on this journey and have not yet reached our destination. ◼
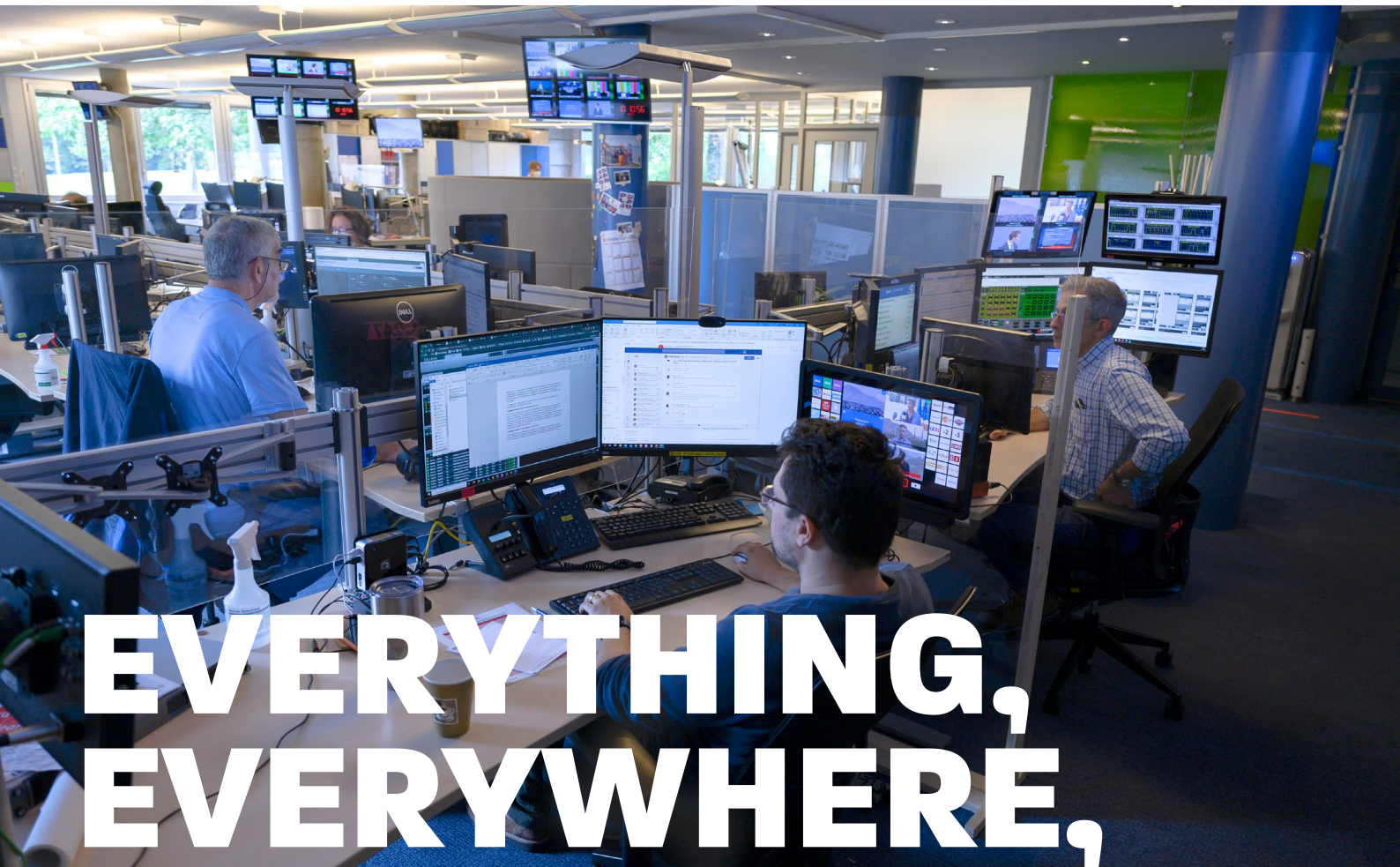
EVERYTHING, EVERYWHERE, ALL AT ONCE

TV newsrooms are facing numerous challenges as they aim to inform viewers, from the rise of 'fake news' to ever-evolving technology. **Liz Corbin**, deputy media director and head of news at the European Broadcasting Union (EBU), talks to Jenny Priestley about how the organisation supports broadcasters in sharing news, and how technology can help

The EBU's Eurovision News Exchange has been providing TV, radio and sports news to member broadcasters and sublicensees for more than 60 years.

Operating in more than 50 countries, the Eurovision News Exchange shares live and edited news; provides global coverage through access to third-party content; includes verification and clearance of social media content; and enables digital news recommendation and monitoring tools.

The biggest exchange of its kind, Eurovision News delivers more than 120 different items to the network on a daily basis, whether that's breaking news or feature material from EBU members.

However, it's not just broadcasters that contribute content to the Eurovision News Exchange, explains Liz Corbin, deputy media director and head of news at the EBU. "We hold some collective bargaining contracts on behalf of our members in order to provide a global service, and we also welcome what we call sublicensees of the News Exchange, including NHK in Japan, ABC in Australia, and the US pool, which comprises CBS, NBC and ABC. They give us access to their pool and in return, they get access to European content."

Operating out of the EBU's headquarters in Geneva, the Eurovision News Exchange also has staff in Moscow dealing with Russian content, a

team in Washington DC, and another team in Rome, where it has strong connections with Vatican Media. "At any one time, the minimum number of staff we need to operate is four or five people, but it's a 24/7 service," adds Corbin. "Often, when we have visitors in the newsroom, they're surprised by how small the team is because the amount of content that's coming in and being produced is so large. The beauty of the Eurovision News Exchange is that there's somebody in every member broadcaster producing that content. We add and refine scripts, but a lot of the work is done by the members."

To deliver all of that content to members and licensees, the Eurovision News Exchange employs a unique system. Edited content is essentially a file upload system, where broadcasters contribute the pictures, script, and metadata together. That's picked up by the team in Geneva where it's processed and then sent out digitally to everyone else. The software-based News Exchange Platform, launched earlier this year, enables members to receive the material directly into their media asset management system, critical for a fast-paced newsroom.

SATELLITE OR IP?

For live contributions, the Eurovision News Exchange employs a European satellite-based system, which enables a broadcaster, for example ZDF in Germany, to uplink a live signal from their headquarters that other EBU members can then take directly off the satellite. "We have three live satellite channels, which is more than any of the agencies," adds Corbin. "Satellite still remains the most reliable technology. It's the hardest to break or interfere with, and as public service media, our members take the reliability of the system incredibly seriously.

"It is expensive, and we are looking into new solutions for the future, but satellite remains quite important until a secure and reliable system that can't be interfered with is found. If we have an internet breakdown in the office in Geneva or at one of the broadcasters across Europe, we can manually playout recorded and live content on satellite channels. If you're 100 per cent dependent on IP distribution, it's much harder."

Broadcasters have been facing multiple challenges in recent years, from the rise of so-called 'fake news', to interfering governments and ever-decreasing budgets. But one of the biggest challenges facing any newsroom is the rate of technological change. Even in the past three years, broadcasters have realised how something like remote production can help them save money, time and travel, as well as deliver their content across numerous outlets.

"Increasingly, our members are delivering their best journalism not just in a TV news format, but in amazing, new digital formats, whether that's on social media or an interactive experience on their website, or however they've optimised it for their apps," explains Corbin. "What the EBU has always been about is making sure that members benefit from being part of this club, and so we share content between us because members are not strictly speaking in competition with each other."

Eurovision News is now experimenting with an exchange of digital content. Corbin explains: "All of the online content from over 30 members of the EBU is now aggregated through an API. We've developed a translation tool called EuroVox, which uses AI to detect the best translation engine between the two languages you're trying to translate, and it automatically translates everything into English and on

demand into 18 other languages. So journalists in newsrooms across our membership can read content from Finland, Spain, Germany, Italy, Cyprus, etc, in the language of their choice."

"Beyond this, 18 public service news organisations are now publishing each other's content in their own language. For example on the news homepage of RTE in Ireland or FranceInfo you can read content from 14 other countries, all in English or all in French."

Technology can help broadcasters in many other ways, particularly in the expensive area of distribution. The EBU has been working on how to do that more efficiently itself, but Corbin says there's a strong desire to receive assistance from outside of the organisation. "We work with a lot of event organisers and, obviously, their priority is to get their story out and get coverage for their event. But actually, there are not many platforms that allow you to download content, stream or have photo galleries.

"We do have a system called Eurovision News Direct, which we developed with an external company, and it allows you to download video in the quality that you want. If you're a TV broadcaster, you need video in the highest quality, but if you're posting it on your website or on social, then you don't need that so you can do it a bit quicker," she adds.

One of the big advantages of News Direct is that it auto-transcribes content, so when a journalist receives a flash mentioning President Biden talking about his relatives in Ireland within an hour-long speech, they can search Biden and Ireland within News Direct and find the exact clip they need. "We use it when we have event clients because then we can open it to everybody," explains Corbin. "It's not just available to EBU members, but newspapers and websites that are increasingly including video content."

THE RISE OF AI

There's also a discussion to be had about artificial intelligence and how it can help journalists. It's something that the EBU is looking at in terms of its potential for public service media newsrooms in particular and how they are going to manage it.

"We've talked about how AI can help with automatic translation and recognising pictures to help create a shortlist," states Corbin, "which is a very manual job for all of our members. The big thing for us is that as soon as you introduce a tool like that, people get over-dependent and don't check it. So the systems have to be in place to make sure a human is actually the last person that deals with the content and that you can really see how it can save time and energy and allow you to redirect that elsewhere."

Artificial intelligence is likely to be a hot topic at the EBU's conference for the international news industry in June. News Xchange is taking place in Dublin between 19th and 20th June, and speakers include Leo Varadkar, taoiseach of Ireland, and former UK prime minister Liz Truss.

"I think both of them are pretty engaging speakers," says Corbin. "Obviously, we're in Ireland so we're delighted that Leo Varadkar has agreed to join us. Liz Truss had the most extraordinary story in the autumn of 2022. She will tell us what she thinks about the news media, and we will be able to pose questions to her, so that will be impossible to miss."

The theme of the event is the front-line news, which has led to Corbin thinking about a recent Oscar-winning film: "I kept seeing all of the hype about *Everything, Everywhere, All at Once* and that just feels like my life," she laughs. "News at the moment means you have to be everywhere all at once." ∎

HOW ULTRA-LOW LATENCY IS ACHIEVABLE HERE AND NOW

By **Emeka Okoli**, VP business solutions and customer success at Zixi

As more TV is consumed via streaming, with even linear TV channels now commonly watched via apps on smart TVs and connected devices, the problem of latency has become an even more pressing one throughout the industry. Viewers are now watching on a wider spectrum of devices than ever before, as well as consuming sports and breaking news stories via social media platforms, so if the content they are watching is slower to arrive than other platforms, it affects their experience. And, for businesses like sports betting that are increasingly moving to monetising live events with close to real-time interactions ('Will player X score this penalty' etc), as well as the growing number of 5G use cases that are being established, both in D2C and B2B, ultra-low latency video is mission critical.

Latency in the video path is nothing new. If you put nothing in the way, the glass-to-glass time for video from camera lens to viewer's screen would be around 30 milliseconds. However, in broadcasting we need to put many processes in the way, from signal conversion to ad insertion, with the result being the average glass-to-glass speed for traditional broadcast is around seven seconds.

Until recently, streaming has been much slower, and live video delivery to viewers has been between 15 to 40 seconds latency. This results from the additional workflow processes like transcoding that are required as part of delivery, and the challenges of routing video via the public internet. The widespread adoption of techniques such as adaptive bit rate streaming, which adjusts the quality of the media stream depending on both available bandwidth and the decoding processor speed of the end user, has brought this down to the faster end of the spectrum, but it is still too slow. And with the increasing adoption of 4K HDR in sports specifically, even 15 seconds can be challenging in some circumstances.

However, it doesn't have to be that way. Linear broadcasters and streaming services alike can benefit from greatly reduced latency using existing workflows. For example, we recently helped Bloomberg Television reduce its latency on satellite delivery from between eight to ten seconds down to a mere two seconds over 5G.

A couple of game-changers have helped achieve this. CMAF (common media application format, officially called MPEG-A Part 19) is one and has superseded some of the older technologies that were developed for the pre-ultra-fast broadband internet. Co-developed by Microsoft and Apple, CMAF uses chunked encoding and transfer encoding to break video down into smaller fragments ('chunks') of a set duration. Roughly speaking these can be published as soon as encoded and forwarded as soon as received. The upshot is that live video delivery can take place in near real time while later chunks are still being processed without the need to build up a large signal buffer.

Then there's hitless failover embodied in SMPTE 2022-7 which sends data down multiple paths to a single receiver and stitches it together by taking whichever version arrives first while maintaining the original sequence.

The Zixi protocol leverages these two technologies alongside adaptive FEC, ARQ, network bonding, and congestion avoidance to algorithmically reconstruct data down the supply chain in less than a round-trip. It also offers options over and above 2022-7 allowing the data stream to be sequenced or bonded, the latter resulting in a delivery system that combines internet, fibre, satellite and cellular connections from multiple providers to form a virtual bonded network optimised for speed and reliability.

All this contributes to its ability to transport live MPEG-2, H.264/AVC, H.265/HEVC, and JPEG 2000 video at ultra-second latency both to and from any location globally, depending on architecture and workflow. Furthermore, this latency can be adjusted to provide additional protection at problematic edge point locations with a high percentage of extreme packet errors without interruption of the live stream (the protocol can recover from up to 40 per cent packet loss).

Of course, we are not dealing with closed systems anymore and other factors will always play a part. Encoding, first and last-mile issues, distribution and network delays can all be factors. In any communication system, there is also a three-way trade-off between latency, bit rate and resiliency, with video being no exception. However, with the Zixi protocol, the trade-offs are at their optimum, and the latency and overhead are customisable, enabling transport of broadcast-quality video according to the unique needs of each individual use case. This adaptability enables broadcasters and operators to synchronise their services, adjusting the latency to achieve video frame synchronicity to the viewers' devices at the same time which helps maintain viewer satisfaction and ensures that the action gets to them, if not at the speed of light, then as close to it as we can manage with all production and monetisation processes customers still need to insert along the way. ■
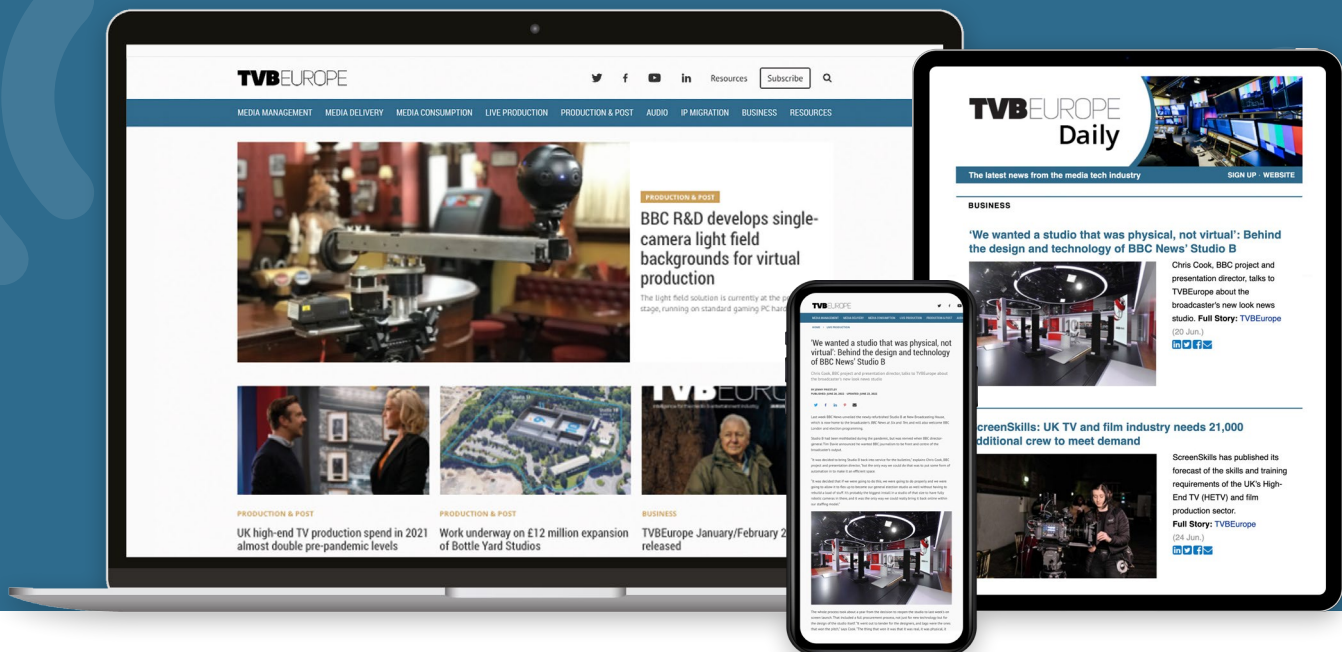
CHANGING THE GAME AT SVT

As a broadcaster operating multiple production facilities, a main office, and more than 48 regional news bureaus nationwide, it's quite a challenge collaborating, sharing files, and airing and publishing stories quickly. Not only are you likely to be managing an extraordinarily complex workflow, but also experiencing high costs for building out and maintaining post-production infrastructure.

This scenario is a good description for Sveriges Television (SVT), Sweden's national public television broadcaster. Based in Stockholm, SVT operates four national digital channels that feature a variety of programming, including news, sports, entertainment, children's shows, and art and culture. The network produces about 2,000 hours of original programming annually in HD.

Over the last few years SVT has steadily moved toward a centralised, virtual news and production platform to foster workflow efficiency, save money, and enhance collaboration among team members, no matter where they're located. A long-time user of Avid video and audio solutions, SVT again turned to the company to help enable remote working and content sharing across its diverse mix of workflows, ensure content security and reliability, and gain the ability to ingest material once rather than multiple times for access by the wider organisation.

"Avid offers the security and stability that we need. We're pretty much producing 24/7, 365 days a year and we can't afford a system to be down more than basically a couple of minutes; and sometimes not even that," says Olof Appelqvist, SVT head of post production.

SVT turned to Avid's solutions to implement a centralised production platform accessible to news and production team members throughout the organisation

SVT now possesses an end-to-end newsroom production solution based on the Avid MediaCentral workflow management platform. Systems, files, projects, and media can be shared across the entire network. Through MediaCentral |Cloud UX software, team members can access content over the internet with very low latency, eliminating reliance on cabling and physical infrastructure. Journalists, producers, editors, directors, and others can collaborate from any location, contributing, logging, editing, and approving content in the field, at home, or in an SVT facility. Because fewer files need to be moved from facility to facility and workstation to workstation, the amount of time needed to get stories to air and onto social media platforms is dramatically reduced.

"To have access and control over all our media is critical when you're working with so many users spread around the world," explains Anders Vallin, SVT product owner. "We need very tight control of who can access what, and MediaCentral gives us that ability."

The financial benefit is significant too. Because the company can quickly scale operations up or down depending on workload, it spends only on the resources it needs at any given time. "We're now working in ways we couldn't even think about two years ago," Vallin says.

DISCOVERING NEW OPPORTUNITIES THROUGH REMOTE ACCESS

SVT took a measured approach during its transition to the new infrastructure, adding a limited number of virtualised Avid Media Composer workstations to enable remote access by its craft editors. Driven initially by the necessities of the Covid pandemic, remote working is now embedded in its approach. Once its remote systems were up and running, SVT leaders began realising other benefits from them. For example, in the past, media had to be copied through a VPN tunnel or to an actual drive to enable access by multiple team members. Today, it's available for editing and approval instantly through the cloud.

"Before, we needed people to actually move hardware around and pull new cables," Vallin explains. "Now you can have an edit session in our private cloud. We're not moving media, we're moving interfaces, and you can work from anywhere on advanced sequences because the computer is so powerful. We can actually work differently and more economically."

SVT editors and journalists rapidly adapted to this new way of working. One of SVT's night-shift editors is based in Australia but covers Sweden's national news. He now produces short pieces overnight by accessing content and adding voiceovers via MediaCentral | Cloud UX, then uses a virtualised Media Composer to edit. Using time zones

The technology enhancements mean that journalists, producers, editors, directors, and others can now collaborate from any location over a virtualised infrastructure

to his advantage, his finished stories are broadcast within hours on SVT's morning news shows.

"Editors can bring work home and it doesn't matter because the environment they log into is exactly the same as on their computer at work," Appelqvist says. "They don't have the big monitors or speakers, but they can reach all the needed content. It's very fast."

EASIER THIRD-PARTY COLLABORATION

Working with third-party providers is a creative freedom SVT grants its editors, and the organisation's open systems ease interoperability across platforms. Previously, editors had to duplicate and export media so that it could then be imported into a different platform; a process that was inefficient, fraught with security concerns, and open to error. "The new system really is a game-changer for us, because for the first time in many years we feel that we're gaining control over those workflows that have been outside, especially when it comes to cloud platforms for sharing or publishing media," Vallin explains.

Another result of the new workflows is that SVT can produce more content to meet the growing demand across delivery platforms; an industry-wide trend that was a challenge before the upgrade. Not only is SVT able to increase the number of titles, but also the number of minutes it produces annually. "Shows have doubled from eight episodes to 16, and we now have an efficient production workflow from the camera to the edit station, so it's no problem for them to grow," Appelqvist says. "We put our production systems through really rough times and they always deliver."

PEACE OF MIND

One of the biggest benefits of SVT's updated production platform is content security. SVT chose to work in a private rather than a public cloud to maintain integrity over its investigative journalists' work. "It's a stable, secure system that can cope with a heavy workload," Appelqvist comments. "As a public broadcaster, people trust us to deliver accurate information. We cannot risk material leaks."

SVT's media storage is secure as well. All editors are directly connected to Avid NEXIS shared media storage through the SVT network, either through fibre channel or Ethernet. "We know it will keep our content safe, allowing us to look forward instead of always maintaining and chasing errors and faults," Vallin says. "We can focus on what really matters, being more efficient and making more content."

Appelqvist's team has big plans for how to maximise their new tools. They look forward to using more features, including artificial intelligence (AI) and metadata, within the MediaCentral | Cloud UX platform to turn it into an even more robust news production platform that will touch every corner of the company. "We'll be able to import more metadata from the beginning, so users can do more data-driven searches instead of general browsing for material, which takes a long time," Vallin remarks.

AI will also generate faster and more self-service workflows. "We want reporters and editors to be able to do more without asking for help, to manage everything from their computers," Appelqvist says. "Our colleagues, our editors and journalists have all adapted amazingly fast to this new workflow and mindset." ∎

IN LIVING COLOUR

Company 3 colourist **Joseph Bicknell** talks to Jenny Priestley about his journey from starting out in his student bedroom, to grading Oscar-nominated film *Living*

Joseph Bicknell grew up just outside London, making films with his friends every weekend. It was during his time at university that he began to dabble in colour grading, joining forces with a friend to grade their film. "I was still pretty young, 18 or 19," he explains. "I guess I needed to find a specialism. I loved the photography side of it and the visual storytelling aspect."

After freelancing and running his own small colour shop out of his university halls, Bicknell moved into a suite at Clapham Road Studios where he set himself up

grading short-form videos. "It was kind of a wild time. For three years people would walk in, hand me a drive, I'd plug it in, make their coffee, prep the project in 15 minutes, grade it, render it and hand them the drive back," he says. "Now I look back on it, I'm just like, how did I get any work done? A phenomenal amount of work went into it. I couldn't do that now."

Bicknell began his grading career using Apple Colour because it was available on his Mac. "To be honest, in a way it was really good training because all you basically had was primaries and the tracker was awful," he

Bill Nighy stars as Mr Williams in *Living*
(Images courtesy of Lionsgate)

explains. "When I started using DaVinci Resolve it was amazing. It felt like over the space of a year, it went from needing this huge turnkey system to just putting Resolve on a souped-up MacBook Pro, and running the whole thing on there. It was clunky as hell and not very fast but you could get the job done. It was a classic example of timing; one year difference in my age or my career trajectory and it would have been very different."

After making the decision to focus totally on the craft of grading, he joined Company 3, moving to New York four years ago.

Bicknell says the move to Company 3 helped him to not only learn from other colourists, but changed the way in which he works on projects. "It really crystalises how you want to do things and how to structure the creative; how you run a session and the nuts and bolts of it," he explains. "There are the actual visuals, how it looks, and there's also how you get there. The intersection between all of the different ways you can do that.

"There's a book that came out recently about the artistic process of how you should look at the people whose work you admire and not worry about copying it," he adds. "It's so funny because I read that much later in my career. I like sitting with other people's work and asking, what makes that tick? What are the components? What do I like about it? Really trying to break it down."

COLLABORATION

Bicknell begins every project with his own ideas, initially working independently from the director and cinematographer. He describes his way of working as having "an intense connection" with the material, including the story and performances.

"You go into it with that, then you park that in a part of your head," he adds, "and you just totally listen to the director and the DoP about their intent, the reasons for it, their journey with the film, and also the specifics of it in terms of the look or anything they have in mind or references. You have to have that creative, inner understanding of the material to fill in the gaps."

However, there are scenarios where the director or DoP might ask what he feels a film needs. "I've only really in the last few years reached this stage of being able to very comfortably jump into those two mindsets, because it's really hard," he explains. "If you come in
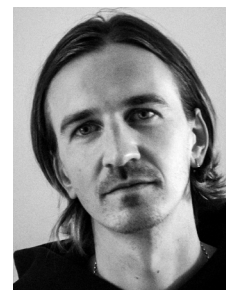
Joseph Bicknell

with your own agency, and your own ideas, it's very hard to then jump into a mindset where you're completely listening, and you're a vessel for someone else's creativity. It's like being able to have an ego and not have an ego. So, it took me a while to get there. It's the only way to have amazing work consistently on every single job that you're on, but also be a true collaborator and be very open to experimenting and going with the flow."

Bicknell's credits include working on music videos for Harry Styles, The Weeknd, and Jessie Ware, while his long-form work includes 2022's *Living*, the story of a bureaucrat at London's Public Works who is diagnosed with a fatal illness. The film, which stars Bill Nighy, had its world premiere at 2022's Sundance Film Festival and went on to receive BAFTA and Oscar nominations.

Having worked previously with *Living*'s director of photography Jamie Ramsay and director Oliver Hermanus on 2019's *Moffie*, Bicknell was keen to work with the pair again. "*Moffie* was just such a beautiful creative experience, Oliver is an amazing director and he's so switched on to the things that really matter," adds Bicknell. "Jamie and Oliver have a really good relationship. They're just very focused on the *why*, which gives you more questions, rather than just giving you answers. I think that allows more discussion about every aspect of the film."

The trio began their collaboration on *Living* before the actors arrived on set, working on an LUT (look-up table) during pre-production. Ramsay then loaded the LUT into the camera during shooting tests. "It gives everyone confidence because the first time they're interacting with the flavour of the final colour isn't day-one on the shoot," says Bicknell. "I think it just takes a lot of pressure off; it really is a much better way of working."

Ramsay wanted two specific looks for the film. The scenes in London have one look, and when Nighy's character Mr Williams travels to Brighton, more colour is introduced to coincide with an important step change within the narrative. "It's really where he starts to awaken," explains Bicknell. "He's not necessarily found a way to use that new energy in a positive way or the way he wants. But it's the start of the journey of him actually coming out of his shell. Jamie felt that was a good moment to really change the look."

It's important for Bicknell to create images that don't feel forced, and Resolve is a major factor within that goal. "The thing I love most about Resolve at this point in my career is it kind of disappears, which is amazing," he laughs. "I say that but I've got some crazy stuff that I do in

Resolve. I've got some compound nodes that have 100 nodes in them, but it's halation. It's so funny that the most complex use of the technology is for a thing which accounts for maybe 0.2 per cent of the look."

BREAKING AUDIENCE FATIGUE

Bicknell describes himself as "human film stock" in the way that he approaches colour grading, with photography a key part of the process. "I'm two-dimensional, that's how I approach the vast majority of colour," he explains. "With Resolve you get a final result which is derived from the photography. Whereas, if you start using a lot of windows and a lot of those more intricate secondaries, you can make basic changes to the image that look forced. But if you try and base it on photography and stay in that two-dimensional photochemical space, you can really be quite aggressive and hide your work, so that it doesn't feel like pastiche and doesn't feel like a layer on top."

The scenes set in Brighton are among Bicknell's favourites in *Living*. He describes the use of colour in the sequences as helping to break the audience's "visual fatigue" following the set-up in London. "You don't want to make the audience jump, but colour can be used to re-energise an audience, and that's what I love feeling when I'm working," he explains.

"Early on in my career, I was really obsessed with uniformity and we must find a look and a palette and nothing goes outside of it. What you actually find is you take a step back and realise that it's all well and good theoretically, but when you actually watch the film, it's very one-dimensional. It's like sound; you can have quiet moments and loud

Bicknell collaborated with *Living*'s director and cinematographer on the film's LUT during pre-production

Bicknell believes colour can be used to re-energise an audience

moments. If a film is always loud, it's not loud. And that's the same with colour. You need the saturated moments and softer moments to really feel the contrast and the grit."

Asked if anything about *Living* was a challenge, Bicknell says he just had fun working on the project. "You're just enjoying the journey. I've done a lot of work to make the technology side of it really as creatively unlimited as possible. If in the last five minutes of the final day of the colour grade, the DoP and the director said, we want to completely change the look of the whole film, I can do that. It's not going to compromise the quality of the film.

"Obviously that's the worst-case scenario and we shouldn't be doing that, but a lot of the negative energy in a session or the challenges in my job come from moments like that, where you're put in a position where you know that to execute that thought or to even try that thought will really diminish the quality of the work," he continues. "It's not about the request, it's about the balance of the quality and the execution."

Next up for Bicknell is boxing drama *Flint Strong*, directed by Rachel Morrison, and Molly Manning Walker's *How to Have Sex*, which follows three British teenage girls on a rites-of-passage holiday during what should be the best summer of their lives. "It's kind of a funny thing. My background is commercials and I genuinely love doing commercials and music videos and short form," he says. "The reason for moving to Company 3 was to do more long form, and so it's really nice that the work is really snowballing and there's lots of exciting projects and variation.

"I just think we are in a good period; a really good period of cinema. There are so many stories that have never been told before that are getting told now. I feel very fortunate." ◼
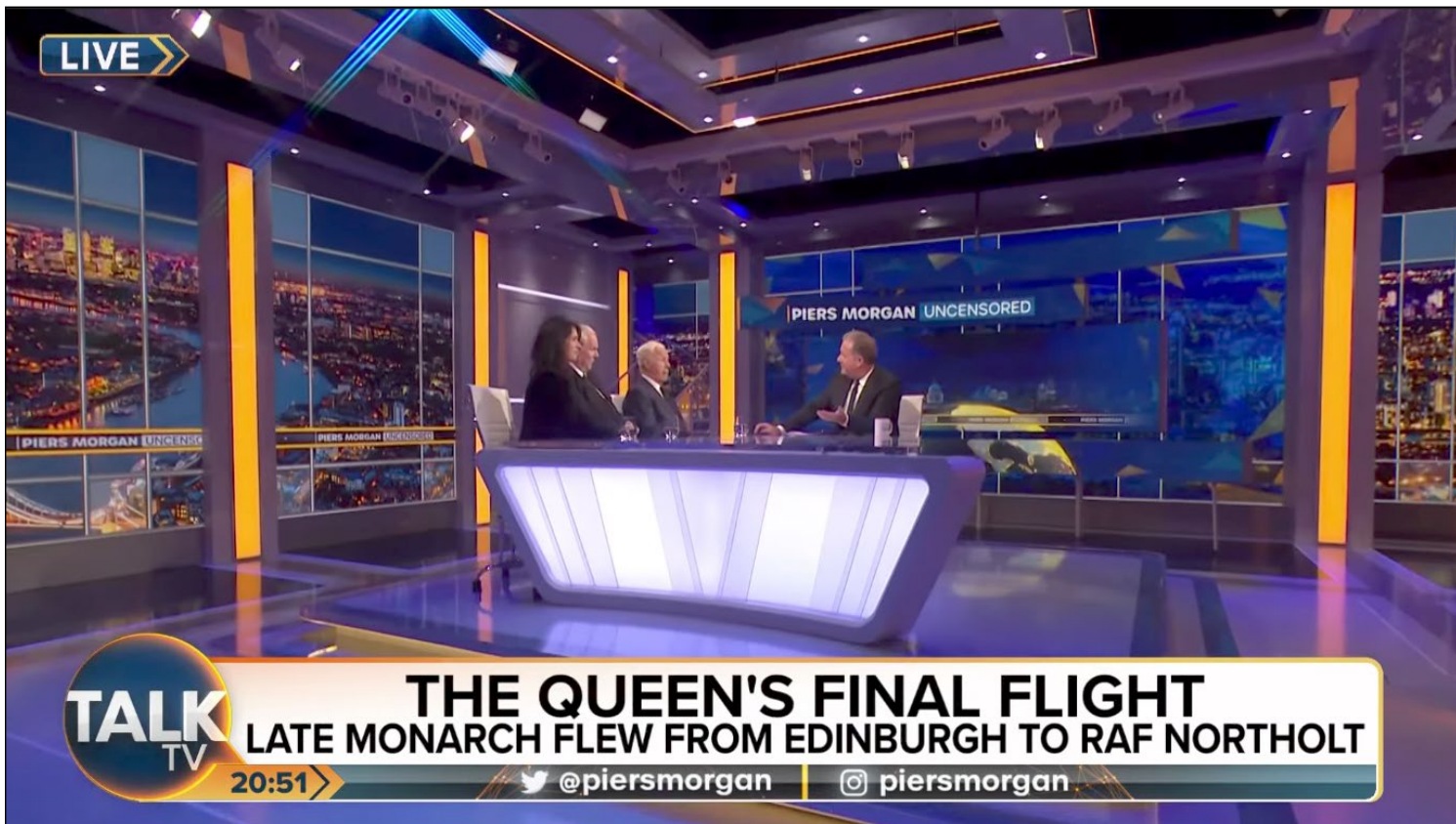
DELIVERING **PRIME** GRAPHICS FOR NEWS UK'S TALKTV

When News UK set about launching TalkTV – a channel focused on news, current affairs, sport, and entertainment – in April 2022, the company needed a complete newsroom set-up, including live production with first-rate on-air graphics, as well as complementary graphics on studio screens. MOOV, a provider of live broadcast services, delivered a solution that makes graphics design collaboration easy, simplifies import of design work from other applications, and facilitates flexible, intuitive playout of multilayered graphics.

A longtime Chyron user, MOOV built the newsroom graphics system on Chyron's PRIME Platform for live production and CAMIO graphics asset management system with the LUCI plugin for integration with the broadcaster's Avid iNEWS newsroom system. Design for the project was handled by Fox News, also part of the News Corp family, which

supplied all the assets to be built within PRIME for on-screen and studio screen graphics.

"We've used PRIME over multiple projects for a long period of time, and it was a system that we know is very flexible and very user friendly," says George Obrey, head of graphics operations at MOOV. "It made building the pack that was delivered to us really easy and really flexible in such a short space of time."

Customisable and scalable to provide "the functionality and resource a production needs", PRIME helps broadcasters produce shows, create graphics, manage content, and drive all dynamic production elements. For TalkTV, the platform's CG graphics and video walls modules deliver critical functionality.

"How PRIME works as a system allows us to kind of create some really dynamic newsroom graphics where we are triggering multiple layers at

CLOCKWISE FROM TOP LEFT: Chyron's software programme LUCI, the PRIME platform, CAMIO, and screen GUI
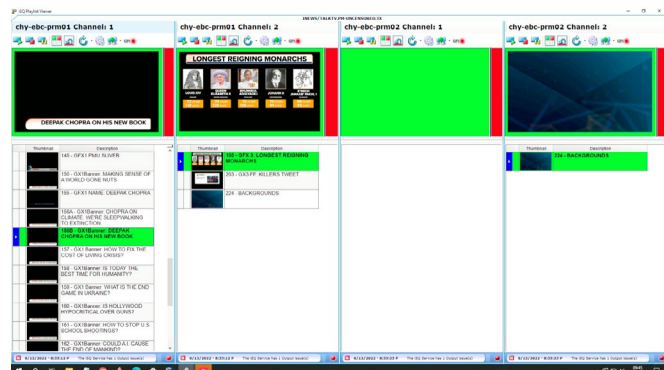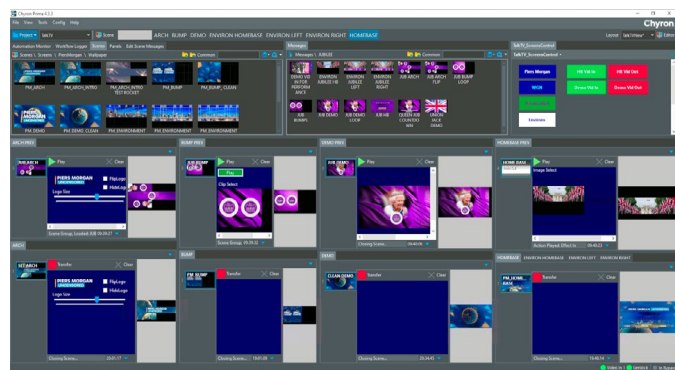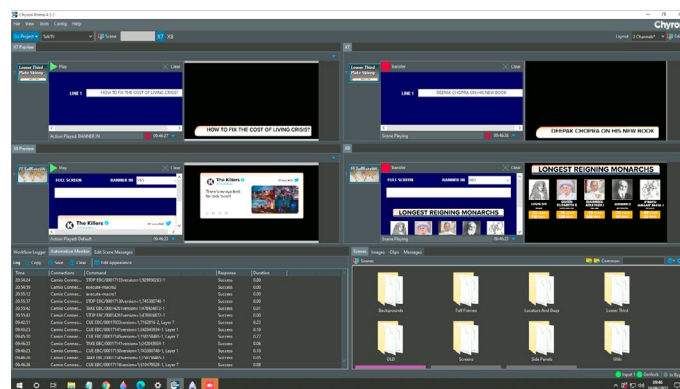
different times to do different actions, depending on what's on screen, so we can create quite a slick and professional output for the client," says Laurie Beamont, head of graphics delivery at MOOV. "PRIME allows us to do that, and quite easily and quickly."

News journalists and producers have more direct control over their show graphics when the graphics system has a MOS (media object server protocol) integration with the newsroom computer system. In this case, it is PRIME graphics, managed and integrated via Chyron's CAMIO, driven by Avid's iNEWS newsroom control system (NRCS).

With CAMIO, templates, graphics, and clips become powerful reusable assets. With minimal training, producers and reporters can easily access them and add text, images or clips from within their NRCS rundowns, with web-based controls, eliminating the need for repetitive orders for new graphics design. Via CAMIO iSQ (intelligent sequencer), operators can use the PRIME graphics engine to deliver the correct template at the relevant time.

PRIME's screen configuration also allows users to employ studio screens in a creative and dynamic way; playing video wall content from PRIME's manual playout interface, or adding video wall content to the news rundown via CAMIO.

"It's always more difficult when you're not only presenting a new show, but a new channel," adds Obrey. "Everyone has different ideas on how they expect things to run, but the combination of PRIME and CAMIO is a really flexible tool to allow us to amend things and deliver to the client what they want in a very short period of time."

While the Chyron solution included no data integration with PRIME as such, it was not without some complexity. The CAMIO server is a

central server feeding two sites via ISQ playout in a fairly complicated set-up, but one that has achieved favourable results and enabled the team to maintain consistency across the project. This model allows users to browse and fulfill predefined templates for broadcast graphics, assemble on-the-fly graphics within the newsroom system and publish them directly to the rundown for on-air playout, and render and import graphics into an NLE timeline with full-quality previews. Directors and operators can make last-minute changes with ease.

"We are always in conversation with Chyron about multiple projects, and it's no different for TalkTV," says Obrey. "We'll always run things by them if we feel we need to seek advice and counsel. Those conversations have always been very open from the inception of the project through to today."

For major news outlets like News Corp that want their properties to stay on the cutting edge of graphics design and playout, a strong vendor-design house partnership, such as the one between Chyron and MOOV, is important. It helps to accelerate new channel launches and enables graphics teams to take full advantage of the latest technologies and workflows.

"We've been really impressed with PRIME and the flexibility it offers – because we're also able to drive graphics for screens and other elements around venues – and the other functions that the platform can offer, as well," adds Beamont.

"The TalkTV project has been a successful one, and we've been able to achieve a lot in a short period of time. And I think the production value that we've been able to offer from a graphics perspective has been really high, not only in terms of on-screen graphics, but also with respect to the in-studio screens as well. That's enabled a very creative outlook for our design team in offering editorial content for programmes." ■

FAST PARTNERSHIPS
FOR FASTER GROWTH

By **Juliet Gauthier**, product manager, FAST, Red Bee Media

F ree ad-supported streaming TV (FAST) generates international headlines and frequently tops the agenda at industry events and conferences. With more than 1,500 channels already available in the USA, global FAST revenues are set to triple over the next four years and hit $12 billion by 2027. Right now, media companies across Europe are eyeing ways to claim their piece of the pie. Harnessing smart technology partnerships to unlock a low-cost, high-potential addition to any content strategy makes business sense in 2023.

FUEL FOR FAST

Macroeconomic shifts lead many viewers to reconsider costly subscription packages and 'cut the cord' where possible. Cost-conscious viewers are looking for free alternatives and are happy to tolerate adverts in exchange for good content. FAST offers a great way for media organisations to reach viewers with free content and keep them tuned in.

Some might argue that 'subscription fatigue' pivots audiences back to traditional linear-like television experiences. Consumers often spend too much time searching for content on multiple on-demand services and prefer the simplified, 'lean-back' viewing experience that FAST offers. FAST channels are easily and quickly accessible to viewers without a log-in, available for free, and with hundreds of channel genres ready at the touch of a button.

However, it isn't always as black-and-white as viewers churning out of subscription packages and straight into ad-supported alternatives. Most viewers will have a few different ways they like to watch content, including ad-supported streaming, subscription on-demand or traditional broadcast. More than anything, today's consumers want freedom of choice. Content owners need to offer as much choice as possible at various price points to align with changing viewing habits.

GETTING STARTED

Top content remains vital to any media strategy. But for content owners and broadcasters to be successful, they need to get their best content to audiences everywhere and anywhere while squeezing the most value out of existing assets. Many media companies are sitting on golden content libraries that will draw audiences in when delivered in a free, easy-to-access TV format. Audience favourites, or classic series that may no longer command the highest value licensing deals are ripe for FAST. Media brands can utilise FAST to broaden the reach of existing content, securing new eyeballs and ticking up additional ad revenues.

Sports leagues, clubs, and rights holders are also looking at FAST as

a way to bring niche coverage to digital viewers across platforms and devices while growing audience reach and brand value. Lower-tier sports organisations are harnessing FAST to engage with underserved fan bases and source extra revenue through video advertising. From an audience perspective, FAST unlocks more options for the casual sports fan. The biggest live events like the FIFA World Cup or the Olympic Games are usually available free-to-air via public service broadcasters, but watching most other premium sports leagues requires a pay-TV or sports streaming subscription. FAST levels the playing field and helps connect a wider pool of viewers to a broader range of sports content. Media owners can also use FAST to upsell fans, providing the right amount of content for free to spike their interest and turn them into paying subscribers. Importantly, the clue is in the name; brands can launch FAST services quickly, inexpensively, and without heavy capital expenditure.

PARTNERSHIP STRATEGY

Today, media companies need to be flexible, combining several monetisation models to create hybrid offerings for consumers. FAST should be considered just one part of a holistic strategy, as a supplement to premium live content to drive additional income and engage new audiences. Content owners are looking for technology partners that can reliably handle high-value, premium linear channels as well as help them spin up FAST and other OTT services quickly and efficiently.

To make FAST a success in a constantly evolving media landscape, major brands are embracing a media services partner approach and offloading risk to focus on content and audience growth. Working with a partner that already has the full toolkit and proven expertise across multiple business models is the simplest way for media companies to deliver a comprehensive and robust content strategy. With the right partner and a future-proof technology roadmap, FAST is a no-brainer for forward-thinking media players looking to accelerate growth. ■

JÜRGEN

A FIVE PART DOCU-SERIES FROM THE ANFIELD WRAP

DOCUMENTING THE LIFE OF 'THE NORMAL ONE'

The Anfield Wrap produces podcasts, live shows, and articles about Liverpool Football Club. In recent months, it has released a five-part documentary about the club's manager, Jurgen Klopp. Jenny Priestley meets director/producer **Fuad Hasan** to find out the score

From the moment he introduced himself as "the Normal One" at a press conference in October 2015, Liverpool FC fans have taken Jurgen Norbert Klopp to their hearts. In the intervening seven years, he's given them plenty to cheer about. Under Klopp the team has won every possible trophy, including its first League title in 30 years. It's often said that Liverpool and Klopp have a special relationship. His politics match that of the city, as does his dry wit.

Described as "essential listening for Liverpool fans", *The Anfield Wrap* has been covering Liverpool's highs and lows since 2011. The podcast has grown to 200,000 weekly downloads in over 200 countries, and its live events have sold out venues in the UK, Ireland, Scandinavia, Australia, and the USA.

Christian Heidel, head of sport at Mainz 05, close friend of Klopp and the man who first appointed him as manager

PRODUCTION AND POST

In December 2022, *The Anfield Wrap* released the first in a five-part documentary series looking at the life of Klopp. Each of the five epsideos focuses on a different part of the manager's life: The Challenge, The Blueprint, The Journey, The Summit and The Legacy. Originally released via *The Anfield Wrap*'s app, the first three episodes are now available to watch for free on YouTube.

THE CHALLENGE

The decision to make the documentary was taken around a year ago when director Fuad Hasan was discussing ideas for content with *The Anfield Wrap* team. "We were thinking about the FIFA World Cup and how that would be a problem for us as our focus is on Liverpool," he explains. "I was looking back at other Jurgen Klopp projects and they never really went in-depth in terms of him as a person and his time in Germany. I'd read two biographies on him as well, and I realised the really interesting stories were around his formative years and time in Germany, especially in Mainz, and his upbringing."

After securing funding from German beer company Erdinger, the decision was taken to produce a documentary series, which would allow Hasan to focus on Klopp's early life and talk to some of the people that he worked with on his journey to Anfield. "The idea was always to talk to people that you might not have heard of, but they are known in the football world and would help attract people's attention to watch it. I wrote a really brief paragraph just sort of summarising the idea, which was basically, 'if Jurgen Klopp had to make a documentary about himself, how would he do it?'"

THE JOURNEY

The Anfield Wrap has made films before, but not quite on this scale. To add to the pressure, it is Hasan's debut behind the camera for the company (although he did make films at university). He worked on the project alongside three colleagues, dealing with research, contacting interviewees and planning the shoots and trips to Germany. In total, the team filmed over 40 interviews with everyone from the man who gave Klopp his first job as a manager, at Bundesliga side FSV Mainz 05, to Liverpool FC legend Steven Gerrard and current player James Milner. Hasan and co travelled to Germany four times, and also relied on Liverpool fans in America to help out with interviews there.

All of the interviews shot by *The Anfield Wrap* team were filmed on Sony A7S III cameras. Hasan says the aim was to be as unobtrusive when filming as possible. "We were trying to infiltrate places that were quite closed off," he adds. "People were not always open to talking about their experiences with Klopp because he is a very private man. We wanted to keep a low profile with everything and and travel light as well."

The series was edited by Jordan Singleton on an iMac using Adobe Premiere Pro, with graphics and title design created using After Effects. Colour grading was done via Blackmagic's DaVinci Resolve.

Travelling to Germany meant that the documentary needed subtitles for some of the interviewees. Hasan worked with Liverpool-based translation company Double Deutsch who helped with translations. However, working in both English and German proved tricky during the editing process. "We'd never worked on anything in a foreign language," he explains, "so the editing process took a bit of time. Our

work experience team helped us put everything into Premiere Pro in subtitle form."

The film also features archive images of Klopp from his time both playing and managing in Germany. Hasan worked with Imago to gain access to the pictures he needed. "They were so, so brilliant," he says. "Initially the plan was for us to use 70 pictures and they allowed us to boost that to 80. They were just so accommodating. They understood that we are a fan organisation and we didn't have the resources of a big production company."

Video footage was also provided by Mainz and regional TV station SWR. "They really gave it to us at a fraction of the price that they should

▶ Liverpool legend Steven Gerrard

Former player turned pundit, Jamie Carragher

Fuad Hasan at work

Current Liverpool player James Milner appears in the final two episodes

Ex-Liverpool player Adam Lallana

have," explains Hasan. "They liked the idea that we were fans. They even digitised some of the footage to send to us, which was really kind because they were so busy. Borussia Dortmund [Klopp's second club as manager] helped us as well."

THE SUMMIT

Liverpool FC have also worked with Hasan and the team with the project, although he admits as Klopp's story is still on-going, he didn't want to focus on the Reds too much. The plan was always to release the first three parts and then take a break before the final two premiered. That led to some Liverpool legends getting involved. "The idea was to get

Michael Gabriel, friend of Klopp and ex teammate at Eintracht Frankfurt II

a couple more big names to relaunch it. Steven Gerrard had watched the first episodes, and was keen to get involved. He was brilliant. Just setting it up with him was so nice. Same with James Milner; we managed to get him for the final two parts. His agent had seen it, so that was very easy to set up. And they were more than happy to be a part of it."

Since its release on YouTube, part one has had over 200,000 views. As each new episode has been released the audience has continued to grow. The plan is to release the whole thing for free once the 2022/23 season concludes, which Hasan hopes will help reach a bigger audience as fans look to find content while the team is on its summer break.

THE LEGACY

Jurgen is Hasan's debut as a feature-length director/producer and he admits it's been a huge learning curve. The biggest challenge, he says, were the logistics involved in making the documentary. "We didn't have a whole production team. It was really just me and one other member of the team that was working on it in the pre-production phase," he explains. "There was so much to do, planning shoots, organising trips, working with people in different countries was really new to me. The local help we received, especially from Mainz, was incredible. They sorted everything for us in terms of interviews, and really gave us a clearer idea of where we should be going, and who we should be speaking to.

"Once we got to Germany, things would go wrong, a location would suddenly fall through and I'd have to come up with back-up plans very last minute. That is something we are used to because we are quite a run-and-gun company. But that happening in another country was definitely something new. Even planning from a story point of view, trying to make something into a series was new for all of us. Structuring each episode was a new thing for everyone, and especially me."

In terms of what he's most proud of, Hasan says he's delighted that the team managed to get the project done. "A year ago this felt very far away," he admits. "There were definitely times in the summer when we were filming where it felt like things were just completely falling through. We had bad luck with Covid and interviews dropping out. So I think I'm most proud of the fact that we got 40 interviews. We managed to talk to people who were very comfortable with us.

"There's a segment on Wolfgang Frank, one of the coaches from when Klopp was at Mainz. He's passed away now sadly, but his son was so open to talking to us and had that trust that we weren't going to twist anything because his Dad is a little bit of a divisive character over there, but a huge influence on Klopp. Just having that trust was really sort of warming."

Now the series is out for people to watch, Hasan is taking something of a well-earned break, although he has got some thoughts about his next project. "We do plan on doing more, the relationship with Erdinger has been brilliant," he adds. "It's definitely been really good for us because it's shown not just to ourselves, but potential partners that we can produce content on this sort of scale. We are slowly raising our production values. I think the plan is to definitely do more of the documentary and longer form content."

Asked what that might involve, Hasan already has a number of ideas. "When we get to the summer we'll start narrowing down what's next, but we have been thinking about one of Mo Salah," he reveals. Can't wait to watch it! ∎

ARE WE GETTING AHEAD OF OURSELVES WITH 5G?

By **Francois Vaillant**, senior product manager, Dejero

China and the United States are significantly ahead of other nations in their 5G rollout, with a combined 652 cities in which 5G is available, according to Statista, equating to around 20 per cent of both countries' 'urban' cities. Overall, this means that we're still a long way off a full 5G infrastructure. In Europe, Spain, Italy, Germany, and the UK, in that order, are slowly catching up. So, what is the value of bringing 5G products to the broadcast market so soon?

BANDWIDTH CHALLENGES

According to Oberlo over 6.7 billion mobile phones will be active worldwide in 2023, and that is forecast to keep trending upwards with a 4.8 per cent increase yearly. If we count all the IoT (internet of things) devices, it is staggering; approximately 42.62 billion by the end of 2023.

Unsurprisingly, more than 66 per cent of internet traffic is made up of video content. Those in the broadcast and media production sectors understand that all content will move to 4K in the near future. Bandwidth is and will continue to become a challenge for carriers as they work to meet the increased demands of their customers.

Enter 5G technology, which promises to deliver a bandwidth 20 times greater than 4G (about 20Gbps) with latency below five milliseconds between the user device and the receiving tower, depending on connectivity conditions.

CARRIER TRANSITION FROM 4G TO 5G

The carrier will most likely use NSA (non-standalone) over SA (standalone) configurations to transition from a 4G network to 5G. NSA 5G is built on an NSA 5G network where the base station still uses a 4G core; effectively increasing latency significantly in comparison to a pure 5G SA network, which uses the 5G core.

Carriers can also leverage existing low frequencies, at least for the first few years of the 5G deployment. To offset the challenges relating to distance and interference with mmWave technology, the wireless industry is also considering the use of a lower-frequency spectrum for 5G networks, so operators can use the spectrum they already own to build out their new networks.

IT'S REALLY ALL ABOUT SECURING TRANSMISSION AND WORKFLOWS

Cellular bonding technology has been a game changer in the last decade for the broadcast sector. It opens up more affordable, reliable and flexible solutions for news gathering and media transmission from remote locations, compared to the traditional SNG/ENG trucks.

As the number of IoT devices continues to increase over time, bandwidth demand will increase accordingly, especially with video already accounting for two-thirds of all internet traffic, and that is without factoring in 4K traffic.

The media and entertainment sector wants to secure its transmission method and workflows. So, 5G is more about securing the bandwidth needed for their video transmission than the bandwidth itself. Typically, a video transmission over bonded cellular will need between five and ten Mbps for HD content, and between 20 and 60 Mbps for 4K content. LTE/4G already has enough bandwidth to support HD or 4K transmission, but the increase of overall traffic is set to change that, which is when 5G will come into its own.

RF AND MIMO ANTENNA ARCHITECTURE

In order to unlock the potential of 5G, optimal antenna isolation needs to be ensured. Take the Dejero EnGo 3 and EnGo 3x mobile transmitters, designed with new RF (radio frequency) and 4x4 MIMO (multiple input, multiple output) antenna architecture, where a receiver and transmitter use multiple (rather than single) radios and antennas to establish a link. Increasing the number of antennas per modem provides wider support of cellular bands for greater performance and reliability. Many 5G mobile transmitters on the market are using 4G antenna design principles where interference by antennas (placed too close together) reduces reliability, especially in areas where cellular signals may be weak, or where many cellular devices are competing for network bandwidth.

Assuring the best connectivity possible and reliability to a 5G tower brings drastic improvements in throughput and efficiency with optimal antenna isolation.

COMBINING MULTIPLE NETWORKS, NOT JUST 5G

The pièce de résistance is the fact that the 5G networks bonded by Dejero transmitters can be combined with other wireless networks, including Wi-Fi and GEO/MEO/LEO satellite, and fixed line (cable/DSL/fibre) wired networks using smart blending technology. This technology intelligently manages the fluctuating bandwidth, packet loss, and latency differences of the individual connections in real time, providing enhanced reliability, expanded coverage and greater bandwidth.

Broadcast solutions providers are making advancements that are all aimed at achieving the performance needed to underpin the '5G' experiences consumers expect in this new era – including in areas such as virtual and augmented reality, gaming, and video streaming – and to secure their future bandwidth needs over time. In conclusion, when it comes to 5G, our industry is futureproofing, not getting ahead of itself. ■

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- How do we get started?
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POINTING THE WAY
TO FULLY VIRTUALISED
NEWS PRODUCTION

TV2 Nord chose nxtedition's platform which controls all the technology in the studio, from the prompters to the robotic cameras and lighting

TV2 Nord perfectly illustrates that small regional broadcasters can innovate with the big boys. The Danish regional station was well ahead of the pack when it came to adopting an all virtualised newsroom production and automation system, achieving high-end programming with a team of just one or two journalists, as **Farah Jifri** reports

nnovation and pioneering new ways of working is where we expect the big, premium broadcasters to play. In 2018, Denmark's TV2 Nord put itself firmly on the leading edge and turned news production on its head. With its existing newsroom equipment coming to end of life, the regional broadcaster had a choice: replace like-for-like or do something different.

Aabybro-based TV2 Nord, one of public broadcaster TV2's eight regional services, has outposts in Frederikshavn, Hjørring and Hobro from which it serves the northern part of Jutland. It delivers two on-air news bulletins each day, alongside updated news online, streamed from its website and available via social media platforms, such as Facebook Live and Twitter. TV2 Nord's CTO Peter Zanchetta explains: "One of our challenges was managing content for all the different platforms as each of these outlets requires media to be handled in different ways. With our existing workflow we had to go into each individual platform to publish and keep track of stories. As a small organisation, where each user publishes content to a different combination of platforms, that process meant having specialist knowledge unique to them. That's inefficient."

The system allows the station to get breaking news out faster than ever before

Faced with an opportunity to break away from traditional news production workflows, TV2 Nord set out to put news stories at the centre of the news production process, searching for a way to ensure content is automatically purposed for broadcast, online and social media use. There was also a clear need to ensure continuity, with integration to some legacy equipment, the archive in particular.

As part of its wider systems upgrade, TV2 Nord built a new production studio in Aabybro that would meet its requirements for story-centric news production managed by a small team. After exploring the options, and inviting tenders, the Danish broadcaster chose to depart from the traditional way of doing things. As Zanchetta explains, "We replaced a system designed for flow television with a single system that handled everything from automation to publishing to online and social media."
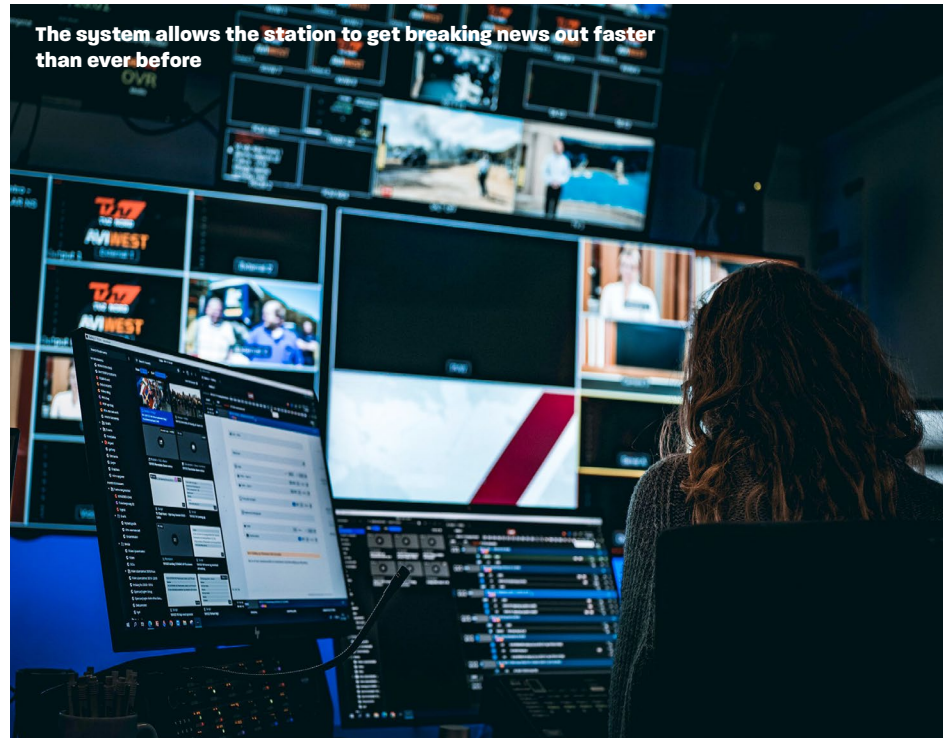
TV2 Nord chose nxtedition technology, which virtualises microservices as a replacement for complex legacy systems, to create a highly automated news production workflow, that went live in March 2019. Here was a small regional broadcaster adopting virtualised news production well before a global pandemic made everyone else sit up and realise that they needed to move to this model sooner rather than later. The platform controls all the technology in the studio, from the prompters to the robotic cameras and lighting, allowing the main news programmes to be produced with a team of up to two people. Furthermore, by virtue of being a software-based set-up, "We were able to drop a lot of the infrastructure and allow the whole team to work in a single interface, regardless of where their stories are published," Zancetta explains.

The nxtedition platform brings together all the necessary journalistic planning tools, story scripting NRCS, media management, rundown creation, studio automation, graphics, ingest with metadata, website clip publishing and final channel playout. Using simple drag and drop features, and remaining within a single system across multiple applications makes for rapid turnaround and high productivity even with a very small team.

In a normal newsroom setting, a journalist working on content for flow television would not be involved in a broadcaster's online portal. According to Zanchetta with the move to nxtedition, "I can come in at 2pm and with a single click see everything that has been done on a specific story up to that point, all collected in a single folder."

Collaborating on a common system enables TV2 Nord's journalists, editors and producers to prepare their stories and send them to the right outlet in a highly efficient way, creating on-screen graphics and material for LED screens in the studio, alongside tweets to promote stories directly from the nxtedition UI. Overall, the system allows the station to get breaking news out faster than ever before. Zanchetta also says that the move to nxtedition delivered fast implementation and allows the broadcaster to eliminate "tonnes of hours of support".

While Zanchetta believes that working more intuitively and efficiently is the only way to keep TV2 Nord moving forward, he admits that it is a risk putting all your eggs in one basket, adding: "You really have to believe in your vendor and ensure that the system continues to develop in a way that you are on board with."

TV2 Nord's production set-up really came into its own during the 2021 Danish local elections, in which nearly 100 municipal seats and five regional councils were involved. The broadcaster's nxtedition system sent data to CasparCG's dynamic HTML5 graphics templates and delivered live link and data for transmission as well as the news studio's video walls. The TV2 Nord newsroom team was able to pull in social media data, harvesting comments from the station's Facebook page and delivering them into graphics templates. The studio presenters had control of the data and graphics delivery to the video wall on the fly from a tablet. "It's easy to customise the system and the content, which is a huge advantage," says Zanchetta. "And we didn't need to integrate another technology platform to handle social media like we had in the past, which again simplifies the whole process. nxtedition has a track record for reliability, which was vital to this project, and are always on hand 24/7 whenever we ask for support."

Instead of sending news and technical crews with an OB truck out on location, the nxtedition system allowed the broadcaster to take a different approach to previous election programming, with live debates hosted in their studio. Voters were able to engage and submit questions, in real time, via TV2 Nord's Facebook channel.

In spite of the radical change to the way news is produced and delivered at TV2 Nord, Zanchetta feels the station is nowhere near the final goal. He adds, "We are continuously evolving, learning new ways to work with the system."

The news and technical teams have regular meetings, known as the workflow group, where suggestions for adjustments to the workflow can be made. By taking a leap of faith before most other broadcasters were ready to do the same, Zanchetta and a small TV2 Nord team are ahead of the curve when it comes to the way news content is created and delivered. ■

Sky News and Sky Sports News deliver breaking news to millions of viewers in the UK. *TVBEurope* hears from both broadcasters about the technology that helps them cover everything from a Coronation to the latest football manager sacking

BREAKING NEWS

GEORGE DAVIES, HEAD OF OPERATIONS, SKY NEWS

TALK US THROUGH AN AVERAGE DAY AT SKY NEWS IN TERMS OF THE TECHNOLOGY USED.

Sky News has about 40 news crews working every day, UK and globally. We have an open policy towards cameras, there isn't a one-size-fits-all. We use traditional broadcast cameras for OBs and special events via our own IP network infrastructure back to Sky. For our daily news gathering, we use any camera that is a high enough quality from 2/3" broadcast cameras to DSLRs and drones.

We have a dedicated NOC (news operations centre) area that handles all the incoming IP streams for Sky News, delivering it live to gallery or to ingest. The newsroom uses Open Media as the NRCS, GV Ingest and Rio editing, Adobe Premiere editing, Viz Pilot Edge GFX, and Viz One archive.

Galleries are based on Ross automation being rundown driven from Open Media, this controls a Grass Valley vision mixer, Shotoku camera robotics and GV playout servers. Studios use a mix of Grass Valley and Sony cameras, Shotoku robotics and Calrec audio.

HOW HAS THAT ROUTINE CHANGED IN THE LAST FEW YEARS?

Covid forced us into major changes in the way we work including developing remote working. Every aspect of TV production was modified to enable us to consistently create and deliver our journalism. A lot of those changes we still regularly use as they empower people to create better content in a more creative and easier way.

DURING THE PANDEMIC, SKY NEWS PRODUCED THE WORLD'S FIRST FULLY-REMOTE NEWS PROGRAMME. WHERE DO YOU STAND WITH REMOTE PRODUCTION NOW?

The last few years have been difficult with Covid for everyone. It's vital that news is kept on-air during a global pandemic to carry not just news but information and constantly changing government regulations that need delivering to the public.

In order to stay on-air we had to put stringent Covid policies in place to keep staff separated and limit the number of people on site. We added a lot of technology to enable remote working, which could be done from home in isolation as well as on-site but in a segregated area where there is no one else around you.

Remote working was a huge change and processes that were never considered as being viable for remote working were implemented quickly and are still in use regularly. Every aspect of news production was modified, we even had news anchors presenting from home. It was a game changer for acquiring, creating and delivering our journalism.

WHAT ABOUT OUTSIDE BROADCASTS, ARE YOU STILL USING VANS OR HAVE YOU MOVED TO BONDED CELLULAR SOLUTIONS?

For live and content delivery, camera crews have a LiveU 300 or 600 with multi-network SIMs for bonding together. Up to 40 LiveUs are in use per day, all cellular across all UK networks.

We still use our growing IP network for all OBs and special events as well as creating local hot spots for LiveUs. We have access to the network in numerous locations across London as well as our bureaus and other affiliated companies.

Sky News' Ross Video automated news gallery

Inside one of Sky News' uplink trucks

Inside an uplink truck with director David Gilman (left) and engineer, Luke Kelly

Cellular coverage is not reliable, there are frequent holes in the coverage and large public events cause the signal to drop so we still need the ability to guarantee delivery. We have 20 Ku uplink trucks but we are experimenting with other satellite delivery companies like Starlink and OneWeb, as well as following the evolution of cellular 5G slicing.

HOW MUCH OF SKY NEWS' WORKFLOW IS USING IP? AND DO YOU EXPECT TO DEVELOP THAT FURTHER?

Sky News is entirely IP for content creation and delivery. Production systems are an IP/SDI hybrid but every day we push further into IP. Eventually it will be 100 per cent IP.

AND WHAT ABOUT CLOUD?

Cloud is a complex word and covers many variations. We use local cloud, small remote cloud and big cloud such as Amazon and Microsoft for a variety of jobs. Our bigger remote cloud productions are great for spinning up for the duration of the event and then shutting down making them very cost-efficient.

SKY IS WORKING TOWARDS BECOMING NET ZERO BY 2030, HOW IS SKY NEWS INVOLVED IN THAT INITIATIVE?

Sky has committed to net zero by 2030 across its entire operations and value chain, including Sky News. We are very focused on delivering this on time. It impacts every aspect of news production from the way crews travel to reducing the electrical load during production. A few examples of our sustainable policies are reusable sets, using GreenD+ biofuel, solar on tech batteries in trucks, rechargeable batteries in equipment and cars, and green catering to remove single-use plastics.

Sky News is albert certified. It's great to be part of an independent standard that actually applies to news. As well as what we do behind the scenes, we have a responsibility to bring people the facts on such a huge and global issue. We take this responsibility seriously and are always finding ways to bring information and stories to life for audiences, for example Sky News was the first news organisation to have a dedicated daily *Climate Show*.

AND NOW, SPORT...

ANTHONY HAGEN, RANGER OPERATOR TEAM LEADER, SKY SPORTS NEWS

TELL US ABOUT THE ROLE OF A RANGER OPERATOR.

I lead a team of ranger operators; we've got two in Leeds, London, Manchester, the Midlands and Scotland. We basically service Sky Sports News, and we're a core group of camera ops who drive around in satellite uplink vehicles, basically. We would probably be the first port of call for the news desk on a breaking news story.

WHAT KIT DO THE VEHICLES INCLUDE, AND HOW DO YOU SEND CONTENT BACK TO OSTERLEY?

The rangers are Mercedes-Benz Vito vans, and they have equipment inside that effectively turns them into a little edit vehicle. You can broadcast with Ku band satellite dish, and there are a number of ways you can get pictures into the truck; a digi-link, we've got fibre cables on board, or your old-fashioned BNC video cables. We have a Blackmagic Design Videohub 20x20 Router in there and we can send pictures back out down the fibre or via satellite.

HAVE YOU LOOKED AT TECHNOLOGY SUCH AS BONDED CELLULAR IN ORDER TO MOVE AWAY FROM SATELLITE?

We still have a fleet of uplink vehicles, obviously, with the rangers, but I would say about 95 per cent of our transmissions now are using bonded-cellular. Across the Sky Sports News estate, we've got roughly 12 LiveU 600s and three LiveU 800s. We have 25 different incarnations of the Mobile Viewpoint units, 11 Dejeros, and 16 Teradeks.

HOW DO YOU FIND USING BONDED-CELLULAR?

We've got a LiveU on our truck and I love it, to a point. It's all great when it works. We will stil pull back to the truck if we need to guarantee

something. Obviously, they work until 90,000 people in a stadium get their phones out at half time. Our particular truck has got an IP dish on, where we can guarantee bandwidth. Or, you just have to wait for everyone to go home and then you send stuff afterwards.

WHAT DO YOU USE FOR CAMERAS AND SOUND?

We are still pretty old school. We still use the Panasonic AJ-PX500 P2 cameras, which are your big, standard ENG cameras that I've been effectively using versions of for the last 25 years. Obviously, in the beginning, they were tape, and they've gone through digital variations. Recently we've invested in Sony FX6 and A7S III full-frame cameras to go on board our trucks. That gives us more flexibility to shoot features with two or three cameras. It used to be one camera op, one camera, and now you have an arsenal of cameras on board to try and do two or three different angles. The requirements have kind of changed.

For microphones we use Sennheiser XSW and AVX. You don't need traditional radio frequencies licensed by the government, it works over Wi-Fi, so that's very useful for us, especially when we're travelling.

THERE'S BEEN A MOVE TO MORE CINEMATIC CAMERAS AS PART OF SPORT PRODUCTION, IS THAT SOMETHING YOU'VE ALSO CONSIDERED?

The Sony cameras that we're now using are sort of a nod to that. Our job is so different that one day we'll be shooting a Glazers Out protest, and then the next day it might be a sit down with Pep Guardiola at Manchester City, and the producers want that to be cinematic. There's a sort of dilemma there because if you make news look too cinematic it sort of takes away from the subject. If I watch *BBC News at Six* I can sometimes see what's been shot on the A7S, which is often at night in war zones, and it almost detaches you from the subject, it's so soft focus.

HOW MUCH OF SKY SPORTS NEWS' WORKFLOW IS IP-BASED? AND DO YOU THINK THAT WILL DEVELOP ANY FURTHER?

A ranger's green power system

The MCR infrastructure is based on IP; most of the ingest, all the bonded cellular, the decoders, and the signal handling is all IP-based. But the galleries are still traditional SDI-based. For me, having been around for so long in the industry, that's been a major shift. Lots of the IP-based stuff and some of the rack-mounted SDI kit, it's been built to sit in a rack somewhere and have fans on it. When it's done 250 miles up the M6 shaking around in the back of a van, does it continue to work? That's the question. And I think that's probably why some of us are reluctant.

WHAT ABOUT THE CLOUD, IS THAT SOMETHING SKY SPORTS NEWS IS BEGINNING TO EMPLOY?

Sky Sports News doesn't produce large-scale programming using the cloud, but nearly all our processes use cloud-based software workflows. The Sky

Sky News' NOC

A Sky Sports News ranger

Sports archive is being pushed into the cloud, but we don't actually make programming in it at the moment. There was more use of it during Covid, and it expedited the process. But I don't think we're there yet.

SKY IS WORKING TOWARDS BECOMING NET ZERO BY 2030, HOW IS SKY SPORTS NEWS INVOLVED IN THAT INITIATIVE?

Our new vans are Euro 6 diesel, so you can use them in low-emission zones. We're currently retrofitting all of our fleet with a new set of leisure batteries, which means we can run our whole uplink kit for up to eight hours. It's basically a day's use without having to run the engine.

A couple of years ago, our team committed to seven sustainability goals, little things such as recycling, leaving earlier and driving slower to save fuel, not eating meat while we're at work. It's not really audited, it's just one of those things where we all think we can do better.

I would like to think that in a couple of years time we'll have fully electric vehicles but that would mean losing some kit from the vans because they're quite heavy. Some of the heavy satellite kit I would imagine will be sacrificed for either more camera kit, or we'll do everything with bonded cellular. ∎

disguise's all-in-one broadcast platform Porta enables journalists to create real-time graphics from the newsroom without the need for a designer

PORTA-BLE
GRAPHICS

The use of extended reality graphics in news production is on the rise. Jenny Priestley catches up with disguise's **Grigory Mindlin** to find out how the company is helping journalists to take their broadcasts to the next level

Grigory Mindlin

From the debut of the iconic swingometer on the BBC's coverage of the 1955 general election to the adoption of extended reality in last year's US midterm elections, graphics are a fundamental part of how broadcasters inform their audiences of major news.

As graphics have become more sophisticated, so has the technology driving them. Earlier this year, disguise upgraded its all-in-one broadcast platform Porta to enable journalists to create real-time graphics from the newsroom without the need for a designer.

The upgrade means that any producer, journalist or editor working on a newsroom system like AP's ENPS or Octopus can use the cloud-based control application to create XR, AR or traditional CG graphics. "We added a plug-in for the newsroom systems so that users can now basically templatise their workflow," explains Grigory Mindlin, broadcast general manager at disguise.

"This integration means that the journalist can create a story, decide what graphic they want to show in XR, and fill in the content for that. The operator can just play it out like they would any other graphic, or even another device can control Porta and play it out."

Mindlin adds that anyone new to Porta would need some training, but it would take no more than an hour. "Journalists in general are used to plug-ins for newsroom systems," he adds. "They just open up the plug-in, search for some templates, fill them in, and the platform shows a live preview, and then you drop it into your rundown.

"Using plug-ins within newsroom systems is pretty easy," he continues. "A lot of the training we do in the newsroom is more around which graphic to use for which segment, and how it will look in an XR environment or AR video wall."

XR EXTENDS ITS REACH

The use of XR graphics within news bulletins and special events has become standard for major broadcasters. Mindlin says disguise expects the use of the technology to continue to grow as broadcasters move away from the traditional green screen set-up. "When you're making programmes that have guests or talent who are not trained on using green screen it can be difficult because it's something that they can't see. It's sort of equivalent to how film production used to be done, where everything's on green screen, and the actors imagine where they're going to be in this world."

He equates XR to the development of in-camera visual effects for film production. "I think it's really going to get wider adoption," states Mindlin. "We're seeing that

already in the United States. Guests and presenters see exactly the environment that they're supposed to be in and any information, graphics, video or Zoom calls, they can 'look and feel'. It creates a connection that I think the viewer really appreciates."

As mentioned earlier, the first version of the API was released at the start of this year, with more updates coming during 2023, including modifications to scheduling content. This will enable users to not just create the content, but also select when it should be played out. "There's also a lot of development on integrating different workflows with data," adds Mindlin. "This is particularly relevant for elections, when broadcasters want to take the data they're receiving and contextualise it against some other data or be able to filter it."

Porta can be used on other genres of programming, from sport to entertainment, and doesn't have to be on-prem due to its availability in the cloud. "It does enable remote production from day one," states Mindlin. "If you're doing remotes in the OB van, or you have people working remotely, they can just log in and use the application, because it runs in the browser. It makes life really easy." ∎

disguise's technology was used by MSNBC to create graphics for the midterm elections in the United States

THE PRICE OF PURSUING 'PERFECTION'

Forty years on from her tragically early death, a new documentary featuring recently discovered tape interviews provides fresh insight into Karen Carpenter's life and music, writes **David Davies**

Ryan Sprinkle

Karen Carpenter's extraordinary voice and distinctive drumming marked her out as a star-in-waiting from the earliest performances she undertook at the end of the 1960s with her brother – pianist and composer Richard – as The Carpenters. But if her impact on the music world was long-lasting, her life was cut short at only 32 by heart failure due to complications from anorexia nervosa; a condition about which there was little knowledge among the public at the time.

The 40th anniversary of her death is being marked in multiple media. For those wanting a deep-dive, Lucy O'Brien's new book, *Lead Sister: The Story of Karen Carpenter*, is a must-read, revealing a passionate commitment to music that never wavered even as her illness took hold. It also reveals the extent of the controlling behaviour she was subjected to throughout her career; from being pushed to 'come upfront' and desert her drum-stool during live gigs, to the shelving of a solo album that she

was working on towards the end of her life, apparently on the grounds that it was insufficiently Carpenters-like.

These threads are also woven throughout new documentary, *Karen Carpenter: Starving for Perfection*, made by AMS Films. Written by Randy Schmidt, upon whose book *Little Girl Blue* the documentary is based, and directed by Randy Martin, the film promises "astounding new insight into the singer's tragically short life and enduring musical legacy".

In shedding new light on Carpenter, the film has access to an important resource; an extensive cache of interviews on cassette that was unearthed during Schmidt's work on the book. For the film – in which they used are extensively – they needed to be cleaned-up and restored, as audio post and sound editor Ryan Sprinkle recalls.

"The tapes were all suffering from varying degrees of degradation, so it was quite challenging sorting that out. There was a fair bit of work to do there in restoring them as much as possible and EQ-ing them to match."

The need to comply with US fair use standards meant that only a small amount of The Carpenters' recordings could be heard in the film, another hurdle to overcome: "The regulations mean that you do have to dive out [of the actual track] pretty quickly." Fortunately, as a composer himself, Sprinkle was able to produce some music with a comparable feel and instrumentation to smooth the transitions: "For instance, I was able to compose a string or piano part to have the same feel as the track we were coming out of so it doesn't die away completely."

Sprinkle carried out all of his work at AMS Pictures in North Dallas, Texas, in a "very nice 5.1 Pro Tools suite". For this project, he found the Izotope RX suite – which comprises a noise reduction and audio repair toolkit – to be especially invaluable during the tape restoration process. "It works like a champ," he says.

More generally, Sprinkle is a huge fan of Waves plug-ins – "they are my workhorses for a great deal of work" – as well as the limiter and other plug-ins provided by the Avid Pro Suite. For his music work, he relies on the Reason collection of virtual instruments, effects and music production tools.

A DEEP DESIRE FOR PERFECTION

The original plan was for the film to be mixed for stereo broadcast, but as festival season loomed it was also decided to produce a 5.1 upmix for theatres. There is no Dolby Atmos mix of the movie, although Sprinkle is certainly open to the idea for future projects: "I haven't done many of those yet, but I am definitely hoping to!"

Sprinkle was not overly familiar with The Carpenters' music beyond the big hits going into the project, but definitely counts himself as a fan now. "I feel very good about how [the movie] has turned out, and am honoured that I had the chance to work on it," he says. "I hadn't delved that deeply into their work before, but the exposure it gave me to their music really opened my eyes up. I have really gone down the rabbit-hole of their music [subsequently]."

While there have been other documentaries about The Carpenters, *Starving for Perfection* casts the spotlight firmly on Karen's life and work. "This is the first film to focus in this way on [Karen] and her struggles," says Sprinkle. "The name *Starving for Perfection* comes from a deep desire for perfection she had in everything in her life, whether it be her performances on stage or her looks. She strived for perfection, almost to a fault, I should say."

Ultimately, there is no getting away from the tragic nature of her demise, which occurred at a point when she could have been on the cusp of an exciting new chapter in her career. Whilst it was unreleased in her lifetime, her prospective solo album – recorded with legendary session players including keyboardist Greg Phillinganes, drummer Steve Gadd and pianist Richard Tee – opened her up to a new musical world that was strikingly different to the soft-rock of The Carpenters' trademark sound.

The film's interviewees include Carol Burnett (r), Randy Schmidt, and the late Olivia Newton John (bottom)

For Sprinkle, this documentary may also be a gateway into more longer-form music documentaries, he hopes: "I had done some smaller projects looking at musical artists for various networks, but this is the first feature-length music doc I have worked on. It's been a great experience having the opportunity to focus for an extended period on one artist. I'd love to do some more of it," he adds.

"I'm a big jazz fan, so I'd love to have the chance to work on a movie about John Coltrane or Thelonious Monk. That would be very cool." ■

"The tapes were all suffering from varying degrees of degradation, so it was quite challenging sorting that out. There was a fair bit of work to do in restoring them as much as possible and EQ-ing them to match" **Ryan Sprinkle**

Collaborating
ON COLOUR

London-based creative studio Black Kite has been colour grading with Baselight since it was established in 2019. **Jenny Priestley** meets the team to discuss its work with the system and its collborative partnership with FilmLight

Black Kite Studios is a London-based independent creative studio offering visual effects and design. Launched in 2019, the company aims to do "something a bit different" in the world of post production. "Creativity is the heart of everything that we do," explains co-founder Julie Evans, "and so is our talent. That was the ethos that we set up with."

The company is based in Shoreditch, East London, away from the traditional location of Soho. "It felt like a real seismic shift from west to east," Evans continues. "It was important for us to be somewhere that felt quite inspiring. There are lots of creative companies and industries around here, which is what made us decide to move to East London. We started off with one Baselight, a couple of Flames and we kind of grew from there."

In four years, Black Kite has grown to 61 permanent members of staff and around 30 freelancers, working across projects including commercials, music videos, and some episodic TV work.

Even the pandemic failed to dent the company's rise. "We always set ourselves up for remote working, we always wanted to be quite agile," explains Evans. "We work with a variety of people in different locations. Covid really pushed that along; we grew during the pandemic because we were able to work remotely on projects and tap into our cloud-based infrastructure for VFX projects."

Black Kite's colourists have used FilmLight's Baselight for grading right from the start, with the decision driven by co-founder and senior colourist, George Kyriacou. "FilmLight really helped us to get going on Baselight. We started off on the Slate control panel, but it only took a few months before we moved on to the Blackboard Classic."

"We opened with two colourists, which is quite unusual because a lot of small start-ups don't even have colour. It's something that they add on later," adds Evans. "It was a very interesting route into growing the business because directors will often follow a colourist. Everyone seemed to be very interested that we had two colourists ready to go. That kind of drove the business."

COLLABORATIVE WORKFLOWS

Baselight has also been a huge help with the company's decision to embrace remote working, Kyriacou has one at his home. It's also helped as the studio has grown to offer other elements of post production. "We work with BLGs which enable us to do a non-commital A grade, so you don't have to commit to it at that point," Kyriacou explains. "The VFX guys can take that and view what we've done, and apply upgrades in their suite. They give us back the raw file and then we can start again if we have to, but throughout the file's journey, we always have a reference of the grade."

"It means the workflow is much more collaborative with the visual effects team," adds Evans. "They can always see the update with the colour correction added to it."

Asked what it is about Baselight that they prefer to some of its competitors, Kyriacou explains that working with the FilmLight team is less of a vendor/customer relationship and more of a collaboration. "I started a long time ago, before Baselight was around," he says.

"When FilmLight came along, they listened to the colourists and created a system which has everything you need in a grading solution, and more. That's what you get in Baselight now. It's far more intuitive and it's fast. Plus, they have great support with staff located across the world, including the UK, so you've got instant support. If you want to call them directly, just pick the phone up, and you've got someone to talk to. I feel like Baselight is the market leader now, certainly in the UK and Europe."

Kyriacou has an obvious love for the system, highlighting many of the functions that he finds particularly useful. "The tracking on it is brilliant," he says. "The way it tracks your windows, your shapes; the fluidity of the windows, the fluidity of the shapes. The keying is fantastic, how you can isolate colours. It goes deeper, it gives you so many different tools. Every time they do a software update there's something else in there."

Another major positive for Kyriacou is how Baselight makes remote approvals much easier. "Obviously with remote grading you can have 6, 7, 8 people in various locations around the world, all using different monitors, and it's very difficult to know the calibrations of all the different monitors," he adds. "FilmLight have developed a system that gets rid of the issue by knowing what browser you're using and what computer you're using. It does the maths, and it puts it into the right colour space for you. That's a game-changer for us. It takes a lot of pressure off us as colourists."

The system is also helping to attract the next-generation of junior and assistant colourists to the company. "They feel like the Holy Grail is to learn Baselight, and when they come here and they get used to Baselight they don't want to go back to using the systems they used before. They just want to move on."

With the company aiming to move further into episodic and long-form work, Baselight will again be their trusted partner. ∎

"When FilmLight came along, they listened to the colourists and created a system which has everything you need in a grading solution, and more. That's what you get in Baselight now. It's far more intuitive and it's fast" **GEORGE KYRIACOU**

MICROSERVICES: AUDIO PROCESSING TO ENHANCE THE VIEWER EXPERIENCE

By **MC Patel**, Emotion Systems

With the growth of online delivery platforms, content distribution has become a complex and time consuming process. Currently the focus is on picture quality as evidenced by the growth in 4K services and the plethora of HDR solutions to provide a better viewing experience. Additionally, there is also the requirement for subtitling, audio description and of course audio which can range from stereo, 5.1 surround, and now increasingly 'immersive'.

Given that content needs to be quickly monetised across multiple platforms and localisations for different countries, there is a need to provide a large number of versions to satisfy the needs and specifications of the end user.

A media supply chain provides MAM services that enables creating and posting jobs, billing and managing signal processing for video, audio and metadata. The good news is that a large number of these processes have become commoditised. Tasks like encoding and transcoding, or inserting audio description captions, are readily available from a number of vendors.

It is becoming the norm that all these services are parcelled up into single workflows in the cloud. This is appealing to production companies and broadcasters who want to speed up and simplify deliverables. Best practice is a single media work order which automatically triggers all the processes, passes everything through a final QC check, and despatches the files to the right recipients.

This is fine for all of those commoditised services. The challenge comes for functions such as HDR, immersive audio and loudness. To get the best viewing and listening experience it is important that these processes are error-free, and the quality has not been compromised. Frequently, these needs are satisfied manually or not at all. Given the volume and the growth of diverse media delivery, manual operations are too expensive.

Failure to get this right can be catastrophic. France, for example, has a zero tolerance to loudness errors. A single excursion and a programme will be rejected, which is a problem if you are up against a deadline.

Looking more generally at the question of audio processing, consider for a moment a premium movie channel. The newest titles come to it with a Dolby Atmos or DTS:X soundtrack. The automated cloud processes create 4K HDR ultra HD masters with Dolby immersive sound, ready for broadcast. There are other processes in the automated workflow that will create HD video, and down-mix the audio to 5.1 and stereo. The viewer is very happy with the quality of the movie. Then up comes a commercial break, where some of the ads have been produced or delivered in stereo, or maybe there is a trailer for a classic movie. Suddenly the sound field collapses. The viewer is at best confused, and at worst will reach for the controls to try to find out what is wrong. The advertiser is also very displeased as the commercial loses all its impact. The sales house will quickly receive calls suggesting that the invoice will not be paid.

Having identified that a consistent sound field is vital for customer satisfaction, the broadcaster will then look to update its archives. The back catalogue needs reprocessing to up-mix the audio, so that everything has a soundtrack that will feed the immersive expectations.

For the broadcaster and the content deliverer, the recognition is growing that audio processing, including up-mixing and loudness control, is a specialist service, and it must be done well. These services tend to be supplied by small, dedicated businesses employing skilled and experienced people as well as dedicated software systems.

But for the operational and commercial reasons we have already talked about, these specialist services must be provided as part of the media supply chain, called by the single work order. The specialist supplier must have the same microservices architecture and a good API so the supply chain provider can integrate the services, progress and monitor the work, and bill the end user appropriately.

What may be surprising is that, in our experience, there may be 60 or 70 audio-only workflows within a typical media supply chain infrastructure. Emotion Systems has worked with leading audio specialists to find out what users really need.

The clear message is that managing audio for delivery is a complex and varied process. These variations need to be accurately described and processed without errors and preserve the highest quality. And these tasks must be carried out repeatedly hundreds and thousands of times a month.

What Emotion Systems is able to provide is the ability for audio specialists to design their own sub-workflows, then have them as shrink-wrapped software that will drop into the media supply chain, communicating with standardised work orders, and allowing as much or as little operator input as appropriate.

This is the practical way that audio standards can be raised and maintained through the automated deliverables process, raising consumer satisfaction, eliminating costly reworks and ensuring revenues are maintained. ■
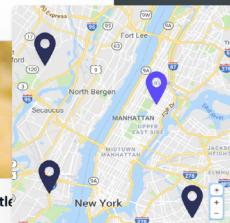
THE HOST IN THE MACHINE; HOW AI IS INFLUENCING CONTENT PRODUCTION

AI is nothing new; Jonathan Swift was writing about it in *Gulliver's Travels* back in 1726 and there have been countless interpretations across science and popular culture since then. But today's AI is having a massive impact, and broadcast and production industries are taking full advantage to create content in bulk and at speed. CLICKON CEO **Richard Wilson** tells Kevin Emmott how technologies like CLICKON IQ are using AI to help humans create better content

Artificial intelli gence is at the sharp end of everyday life, and depending on your viewpoint it cuts both ways. In just a few years the likes of OpenAi and Midjourney have changed how we view and interact with the world.

On the one hand, we have people using ChatGPT-4 to get out of paying parking tickets and producing synthetic images to win Sony World Photography Awards. On the other, we have growing anxiety about AI sentience and how that might lead to the end of the world. An open letter from the Future of Life Institute asking for a pause in AI development has already attracted thousands of signatures. Nobody wants to see Terminators from the future showing up in their back garden, not when the petunias have only just flowered.

Either way, we can't get away from it. Every time we go online we're nudged towards a story about how AI is influencing our lives, all powered by AI-driven algorithms on platforms like Google, LinkedIn and Facebook.

At this year's NAB, AI was the headline story for many companies scrambling to get on board. ENCO's new ENCO-GPT utilises ChatGPT to summarise news stories to fit a specific run time, Adobe has incorporated AI-powered text-based video editing into Premiere Pro, while companies like Veritone, SAS, Newsbridge and Blackmagic all promoted AI solutions.

It seems like a brave new world, but in fact, it isn't at all, and CLICKON's CEO Richard Wilson reckons there has been a cultural tipping point that has brought it to everyone's attention.

"AI has been around for a long time, and it took ChatGPT to bring it into the cultural Zeitgeist," says Wilson, who co-founded CLICKON in 2012 and has been developing AI technology for content production since 2016. "The production industry has always pushed the boundaries of technology and we love to grab onto the latest and coolest thing, but AI has the ability to re-energise and streamline the way we all work. That's why people are trying to work out how it might impact their business."

It may have taken ChatGPT to get noticed, but it was Covid that opened broadcasters and content providers' eyes to the full benefits. As post-Covid

workflows continue to embrace distributed production, content producers are seeing the efficiencies of remote working and AI is all about efficiencies.

Wilson knows this already; he's been invested from the start. CLICKON is an all-in-one content tool used by brands such as Amazon, Lenovo and Expedia to streamline the creation, management and distribution of shortform content across multiple digital channels.

"We've always been a creative technology company, and now creative technology is more of a necessity than a fighting faction of two elements," he explains. "As social media grew in stature, we saw production models shift; we were already creating content in an efficient manner, but brands no longer needed traditional media partners to reach their audiences because social media had placed itself between customers and those traditional media outlets.

"We started building technology products which spun down publishing to help brands become their own publishers," he adds. "Messaging is always on for brands, across all channels, and our goal was to provide a way to produce content that does this at scale."

AI was the key. It performs tasks that normally require human intelligence and develops these tasks using machine learning that recognises patterns, makes predictions, and improves as it's exposed to more data. Most AI deployments across the production industries utilise AI in the exact same way; AI in broadcast and production is all about machine learning.

A product like CLICKON IQ connects people working on complex campaigns across multiple sites, but while CLICKON IQ promotes collaboration, it is the inherent AI that adds all the value by ensuring that companies get the best out of that content.

Wilson continues: "CLICKON IQ covers the whole production process from pre-production through to editing, approval, and scheduling, but if you are creating something that isn't performing, there's often a problem in the creative process. AI can help with performance recommendations, such as assets which have worked well in the past. The question becomes how to spot the things that work in the real world and implement them in the creative process before it's too late. If you can do that in real time it makes everything more efficient.

"This is where AI is helpful, to predict performance across specific channels and provide the supporting metadata to help optimise assets," Wilson continues. "These are microservices which provide the kind of insights that teams can't always get in a timely fashion because it takes too long for a human to collate that information. It accelerates feedback loops and hence accelerates the production process.

"AI allows creatives to focus more on the development of ideas and less on the mundane process elements of work; no-one loves tagging or adding metadata to content. Moreover, in pre-production, AI tools like Midjourney and DALL.E2 can create a storyboard in minutes, a process that used to take weeks or even months. AI will increasingly help bring ideas to life in a more efficient way."

The opportunity to extend creative time and focus is an interesting by-product of AI, particularly when so many are focussing on how AI will lead to job losses or the removal of humanity from the process. In a March 2023 report by Goldman Sachs, the investment bank predicted that generative AI could replace up to a quarter of jobs in the US and Europe, although it also provides the possibility of a "productivity boom that raises economic growth".

Such a productivity boom is evident in the kind of short-form creative content which CLICKON produces, although Wilson thinks that for long-form content, we're not there yet.

"If you asked GPT-4 to write a 1,000-page article on AI it would probably do a really good job but if you asked it to write a 1,000-page novel, it might come unstuck," he says. "I see the same analogy with the creative process. For long-form filmmaking, AI isn't there yet, but if you're creating 1,000 x five second ads for multiple distribution channels then it's considerably more efficient than a human being."

Machine learning is taking the lead in production and CLICKON is already gearing up for v2 in Q3 of this year, but beyond that the future is there to be discovered.

"I'm excited by AI; everyone can use more speed and efficiency, and there's no reason why companies shouldn't want the efficiencies that AI can offer," states Wilson. "It's going to change the way a lot of us work, but who knows where it will go in the future." ■

CLICKON's analytics platform
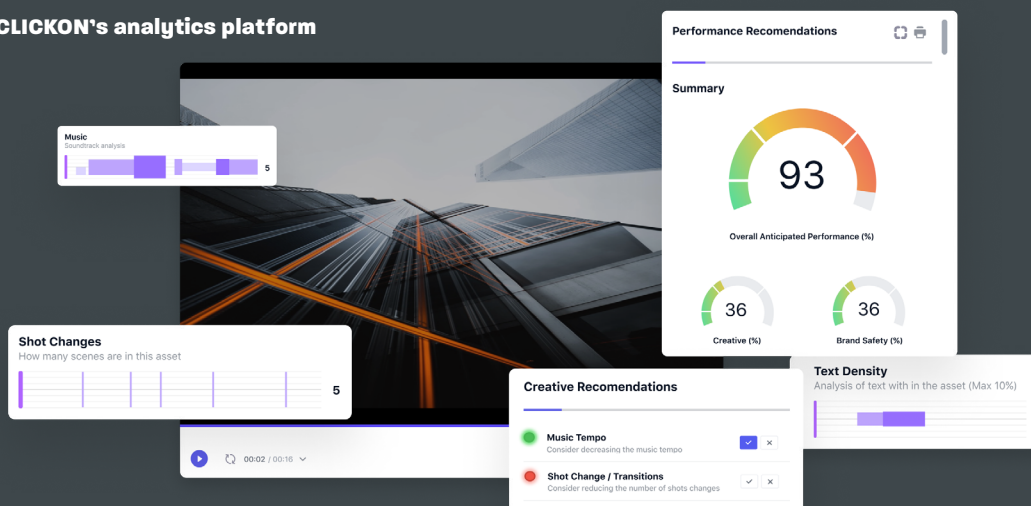
Richard Wilson

CONTEMPORARY
CABLING FOR MAJOR PRODUCTIONS

As a preferred wiring company to some of the most prolific media companies and systems integrators across the globe – providing wiring services at the world's biggest sporting events, popular reality TV shows and cutting-edge productions – Axis Media offers a boots-on-the-ground insight into the challenges that IP adoption brings to cabling for major productions.

"We work on cabling for everything from OB truck builds, upgrades and maintenance to flypacks, on-location and cross-site wiring," explains Martin Chalkley, the company's founder. "Our work is critical as we're ultimately responsible for the transmission and integrity of every signal from every camera to the production units and beyond, often for live broadcasts."

Axis Media is currently providing wiring services for a motor racing world series; it's also scheduled to provide cabling for a famous London-based tennis tournament this summer; and earlier this year, it completed a wiring project for a yet-to-be aired game-based reality TV show for a leading OTT subscription-based video platform.

"In such a fast-moving industry, final decisions can be last minute, so we've learned to be reactive," adds Chalkley. "Reliable suppliers, such as Argosy, are essential as they can always deliver the next day. Project budgets and financial constraints mean that materials, such as racks, metalwork and flypacks need to be recycled, rather than replaced. This is a challenge in itself, more so than working with brand new materials, as breaking down these items has to be done in such a way that they are not damaged."

A SIGNAL CHANGE

Now that viewers are demanding high-end UHD content across multiple viewing platforms, HD-SDI bandwidth is no longer sufficient and media companies, broadcasters and production companies are now rapidly implementing IP workflows.

"HD-SDI bandwidth is unidirectional and cannot manage multiple inputs and outputs, unlike bi-directional IP switches," explains Chalkley. "Another major benefit of IP systems includes cloud-based platforms, which of course require less physical storage. Because of this, there has been a major change in cabling and connectivity requirements."

With major networks and broadcasters choosing the IP route, there has been a massive reduction in copper cabling, which has presented challenges for wiring teams. To stay ahead of the game, Axis Media has re-trained its wiring team to work with fibre cabling and fibre
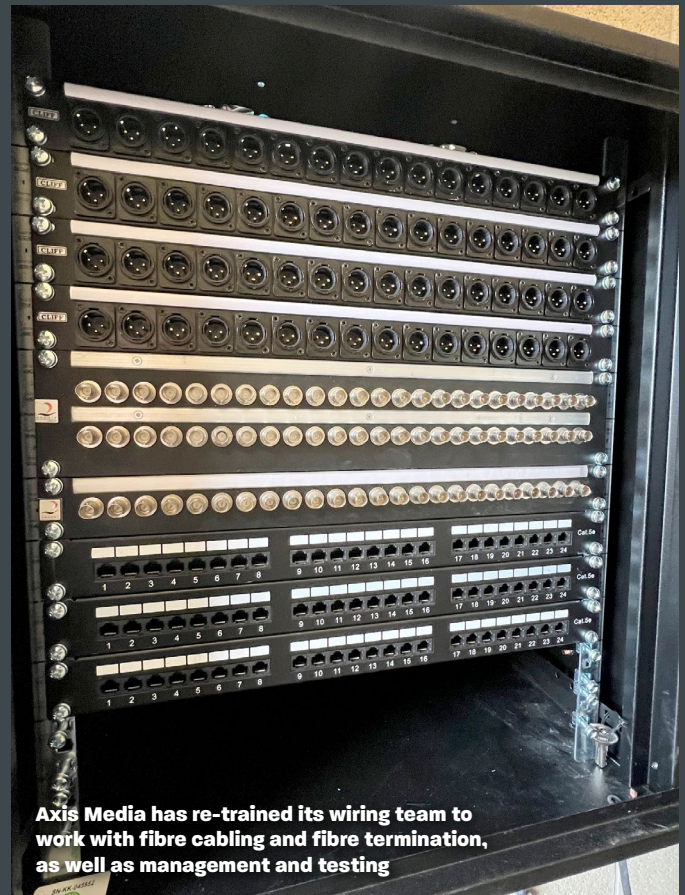
Axis Media has re-trained its wiring team to work with fibre cabling and fibre termination, as well as management and testing

termination, as well as management and testing, which has also meant a significant investment in termination and testing equipment.

"Argosy has been an invaluable partner in this field by supplying equipment and fibre products, coupled with advice and training," Chalkley says. "I believe that wiring huge 500 x 500 video routers to termination panels will be few and far between – requests to wire this sort of technology are becoming less and less – especially for larger production companies."

Only a few years ago, fibre cable was twice the price of copper but is now considerably less, and it has a much greater speed and distance of transmission than copper.

Axis Media provides wiring services at the world's biggest sporting events and popular reality TV shows

to supply what we need when we need it," says Chalkley. "Regarding the types of signal cables, there is a huge amount more data cable and especially fibre required now within the OB trucks."

Chalkley points out that trying to get another 50 or so CAT6 and fibre cables through a ten-year-old OB truck in an already full cable duct "is an art in itself". Running new fibre through the underside of a vehicle and preventing any damage is challenging. Installing large amounts of fibre into an already packed rack, whilst keeping the cables protected, requires skill, and any new cables need to be serviceable considering the physical confines of OB racks, with replacement often favoured over repair.

However, this can be overcome by adding contingency cables, running draw wires for future cable pulls and using protection tubes within the racks. "We also encounter a lot of damage and corrosion to the connectors on the tailboard which are in constant need of repair or replacement," Chalkley continues.

ON-LOCATION BROADCAST

Axis Media has worked on many multi-sport and racing events including the pre-wiring of flypacks for on-location production and on-site wiring and support.

"If we are pre-wiring a flypack for use in multiple locations, we must be mindful of the event's conditions and physical environment and that it will shift from location to location. The wiring must sustain the rigours of being constantly loaded and unloaded, so the quality of the cable and connectors must be of the highest quality. The range of materials available from Argosy ensures this can be achieved," explains Chalkley.

Rack building for major multi-sports events has changed significantly over the past three to four years with the increasing demand for more channels and more content on more platforms. Greater bandwidth is required for the transmission of 4K UHD, which SDI simply cannot deliver. Thus, IP systems are in greater demand and wiring companies are installing more fibre, fibre switches and Ethernet cabling.

Project budgets and financial constraints mean that materials, such as racks, metalwork and flypacks, need to be recycled, rather than replaced

"Most copper networks can provide speeds of up to 100 Mbps but are becoming less efficient and more expensive, whereas fibre uses less energy than copper systems," observes Chalkley. "Now that copper is reaching the maximum data transfer, it makes total sense that fibre is becoming the industry's favourite."

Copper also carries five times higher maintenance costs than fibre. As it naturally corrodes over time, copper has a limited life expectancy and is more susceptible to signal degradation and other performance issues.

"A growing environmental awareness and the industry's focus to reduce carbon footprint is another reason to phase out copper-based installations," adds Chalkley.

CARETAKING IS CRUCIAL

There is a constant requirement for cable maintenance, especially when it comes to OB trucks due to the fast-moving nature of the business and time constraints. If we take the English Premier League as an example, multiple football matches are covered over the course of a single weekend, as well as during the week.

"Because of this we have short windows to replace damaged cables and connectors, so we rely on companies like Argosy and their ability

SUCCESSFUL CONVERSIONS

"We are often asked to change out old control systems, multi-viewers, vision mixers, serial router panels and 'glue' on trucks, and upgrade them to IP. Where possible existing cabling is reworked including re-pinning control cables, adding Ethernet and fibre."

Understanding how the conversion from serial control and IP works is an industry-wide challenge: "We often need to search online or through old manuals to find out how an old system works to enable us to use conversion successfully," says Chalkley.

The challenges continue, but with training, knowledge and understanding, as well as reliable suppliers, wire companies like Axis Media, continue to thrive in the age of IP. ■

FUELLING THE INDUSTRY'S PASSION

From starting out in the newsroom, to leading one of the media industry's biggest companies, Avid CEO and president **Jeff Rosica** discusses his love of the media tech industry

How did you get started in the media tech industry?

I got the chance early on in my career to experience video editing and the newsroom, and I fell in love with the intersection of technology and telling stories. That is when I knew that media technology was where I wanted to spend my career. I wanted to be part of an industry that would fuel my drive to leap at the job every day. If you're lucky enough to find it, it's a true source of joy and it's terrible to live without, whether you're a CEO or just getting started.

How has it changed since you started your career?

Obviously, media tech is constantly evolving, but there have been moments of real change along the way, often driven by necessity and confronting catastrophe. The devastating tsunami in Japan accelerated the switch from videotape to servers. Similarly, working through the Covid pandemic made us realise we can adapt and change faster than some previously thought. That's welcome progress, but it puts the onus on companies like Avid to adapt and accelerate with an expected pace of tech innovation. Just three years ago, remote collaboration in the cloud was a pipe dream for most media companies; now it's a staple.

What makes you passionate about working in the industry?

Quite simply, it's the people; our customers, industry contacts and, of course, my colleagues at Avid. There's so much you can learn from them all if you really take the time to listen. We invest heavily in collecting customer viewpoints and aspirations. It directly informs our technology strategy and product roadmap.

Similarly, listening to our own employees is so inspiring. I'm passionate about empowering them with the runway to make their own decisions. It keeps Avid agile and creates a healthy culture of trust within the business. I think it encourages employees to evolve and provides them with the latitude to do their best work.

If you could change one thing about the media tech industry, what would it be?

I've always felt the industry moves too slowly. Sometimes we can be too careful, too cautious. Working through the pandemic showed media teams and editors just what's possible; that rapid change can work, and how migrating to the cloud can empower them. There are so many benefits from working in the cloud: editing, disaster recovery, business continuity, and allowing teams to work from anywhere in the world.

How do we encourage young people that media technology is the career for them?

We find a lot of young people get into media tech through using and having fun with the creative tools on offer. It fuels their passion, whether it's film editing or music production. So, for our part, we're making sure that more young people have access to training on the tools specified by professional environments, which is one of the most critical needs our media company customers want us to help address.

Where do you think the industry will go next?

The pressure to deliver more quality content, faster, is clearly not abating; quality content keeps viewers viewing. The skills shortage remains a big obstacle to delivering this, and while training is one way to address it, increasing access to the pool of available talent is also important. So, the use of more highly distributed, virtualised teams will only increase. And of course, AI is now very real. Many are exercising caution on the integration of AI/ML to media tech, but I believe the advantages of AI will outweigh the disadvantages, and we're now at a tipping point.

What's the biggest topic of discussion in your area of the industry?

Greater efficiency, distributed teams, transformational management, subscription, cloud, data use. These are all component topics, but it always seems to come down to product and service innovation. At Avid, we're evolving to operate and deliver it faster than ever. We spend a lot of time listening to our customers and making sure we're removing any barriers to success, however they define it. It's our honour to have the world's leading editors, broadcasters and music creators rely on us to enable their award-winning creativity.

What should the industry be talking about that it isn't?

Perhaps we don't talk much about ESG yet, but I see a lot of positive intention rising up behind the scenes. We're focused on helping broadcasters, studios and others to be more green by moving production to the cloud, to allow facilities to free up resources and reduce their on-site costs. We're also hard at work to make this business more inclusive and accessible, helping more people to see there's room for them as storytellers. Our industry expects things from us and our type of company and how we act. It's important to all our stakeholders; investors, customers and individual users. ∎

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