

4TH QUARTER 2021

JOURNAL

119

REPRESENTING THE BROADCAST AND MEDIA TECHNOLOGY INDUSTRY WORLDWIDE



Evolving Media Economics

Data-driven solutions turbo-charging practically every segment of the BaM Content Chain®

Also Featured

Rise Up Academy

How the Associated Press applied AI



Knowledge, support and leadership for the Broadcast and Media technology industry

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Stronger together



Peter White
CEO, IABM

Like many of us, I was greatly looking forward to – at last – getting back together again as an industry for IBC2021, but with the deteriorating Covid situation in the Netherlands, IBC's decision to cancel the show was the right thing to do and is a reflection of IBC's responsibility to the industry.

IBC exists for the industry only. Unlike other events, it is entirely owned by the industry and, thanks to its success over the years, has contributed a great deal through this structure to keeping the Broadcast and Media sector vibrant and moving forward; there is no substitute for the good work it enables or the sense of community it engenders. IBC is truly By the industry, For the industry. It is therefore particularly important that we all get behind IBC now to ensure it can bring back a fantastic show in 2022 and beyond.

Our theme for this issue, in line with our December BaM live!™ virtual event, is Evolving Media Economics. It is now several years since I noted in these pages that the 'power' in the industry was shifting from a broadcaster-led push model to consumer-driven pull.

The huge acceleration in the industry's move to OTT as a result of the Covid pandemic, driven by rocketing demand for on-demand entertainment by people around the world being confined to their homes, continues at pace even as things – at least in some parts of the world – begin to open up again. It's a door that cannot and will not be closed again: the viewer is now the kingpin in Media & Entertainment, dictating the terms on which they engage with content. This has fundamental ramifications right across the media supply chain – both for broadcast and media companies and our media technology supplier members.

Granular data – revealing what viewers want (and what they don't) – is the key to

helping media companies successfully navigate this new landscape. But data on its own does nothing – it's only when innovative tech companies create tools to enable their broadcast and media customers to exploit it that it becomes a useful business tool. A number of the articles on Evolving Media Economics in this edition of Journal bear this out, with data-driven solutions turbo-charging practically every segment of the BaM Content Chain®, with the Monetize and Consume areas at the top of the list.

The sheer amount of data that can now be gleaned is light years beyond manual processes to turn into actionable insights, and – as illustrated also by a number of the articles – AI/ML is very much now the bridge that converts that raw data into useful knowledge. Whether that's AP's collaboration with Limelight to shorten its production processes by leveraging AI for automating metadata extraction from video and audio, or Salsa Sound's use of AI to create immersive 360 audio experiences, AI/ML is central to exploiting data for both business and creative purposes.

The move to the cloud to support OTT operations is also very well explained in many of the articles, offering a range of different approaches but all with the same end goal: to increase consumer engagement, building loyalty and maximizing monetization while streamlining the processes to deliver this paradigm with a sound, profitable business model.

In the last issue, we announced the formation of the IABM Diversity Action initiative, and we will shortly be announcing the next steps in our mission to ensure everyone has equal opportunity to be the best they can be. Carrie Wootten, Managing Director of Rise, is closely involved, and has led a number of enlightened initiatives not only for women already working in our industry, but with the Rise Up Academy, has also extended this right back to schools. Carrie's article on page 10 makes for inspiring reading.

We were very sad to learn of the untimely death of Hassan Ghoul in October – one of the most liked and respected people in our industry. Just how much he was valued – and how much he is missed – is very clear from the tributes to Hassan that we have collected together on page 96.

I hope you will enjoy, and gain plenty of useful insights, from the wide range of articles in this edition of the IABM Journal – the biggest we have yet produced thanks to the enthusiastic participation and willingness to share their knowledge of so many of our members. Although we cannot now meet face to face in Amsterdam, I urge members to keep in touch with us to ensure that we continue to meet your needs. The BaM Zone™ platform (on which we host BaM Live!™) is the perfect place to do this, and of course all the team welcome any form of contact – email, phone, social media. Let's all stay in touch – I know I've said this before, but it's always worth repeating: together we're stronger.

Peter White
CEO, IABM



The case against consumption-based pricing models



Julian Wright
*Blue Lucy,
Founder*

Imagine if TV companies charged consumers by the minute to watch a football match. Or if your office rent increased when you had a particularly busy month at work. Sounds preposterous, doesn't it? Yet, this is exactly how many media management systems providers are currently pricing their services, and no-one is batting an eye, indeed, it is a model that is being extolled by many. But examination highlights that consumption-based models for management systems are only beneficial to smaller operators.

The media and entertainment industry was slow to embrace the Software as a Service approach introduced by companies like Salesforce over two decades ago. The last few years has, though, seen a massive uptick in the adoption of cloud services and many media operators are now enjoying the benefits of easy access, instant scalability and the financial flexibility that make SaaS applications so appealing to many other business sectors. However, with this new way of working comes a whole new approach to cost and, for the media industry in particular, this aspect of cloud adoption has not been without its headaches.

Specifically, anecdotes of 'bill-shock' abound as content producers

struggle with the apparently contrived complexity of costs associated with downloading or exporting their content from the cloud and many articles have been written (including some of our own) on the infamous egress fees. But, perhaps the media industry's preoccupation with egregious egress costs has distracted us from other issues with some cloud-based pricing models which may not be as beneficial as they first appear.

Fees for transcode services and content egress are based on a consumption pricing model which Amazon Web Services (AWS) are credited with pioneering. It's not really a new concept of course, we've been paying for consumables such as gas and electricity in this way for

... the media industry's preoccupation with egregious egress costs has distracted us from other issues with some cloud-based pricing models which may not be as beneficial as they first appear

decades. In that context, the consumption model for media services is very clear, and inherently fair.

What is more difficult to reconcile, is the application of the consumption model to management systems that simply orchestrate 3rd party services. For example, some cloud media management providers charge a standing fee for access to their platform and, on top of this, add a variable charge based on the volume of content under management or the 3rd party services utilised. These management costs are in addition to the cost of the actual consumable service and are categorised as throughput overhead. Some providers 'bundle' a storage or a throughput allowance and charge an 'overage' rate if it's exceeded, a shameful oxymoron in context of cloud.

This model works for smaller operators – in fact it's seen as the perfect pricing structure for SMEs because it affords access to enterprise class management software, on a pay per use basis, with a very low cost of entry. Yes, the base costs are a little elevated over the underlying services and each transaction is a little more expensive, but this orchestration tax is worth paying for the operational benefit and convenience.

But, for anything but the smallest operators with only a few TB of content, this orchestration tax becomes noticeable, if not burdensome. Providers are quick to justify the model by pegging cost to success – the more content a producer has under management, the more work they are doing, the

more successful they must be and, ergo, the more revenue there is to spend on services. This creates a very linear relationship between busyness and cost – which is just about justifiable for video processing services where work is proportional, but that is not the case with management systems.

Our advice is that medium and larger scale businesses, in particular, should engage directly with underlying service providers and factor in future growth to identify which model is right for your business.

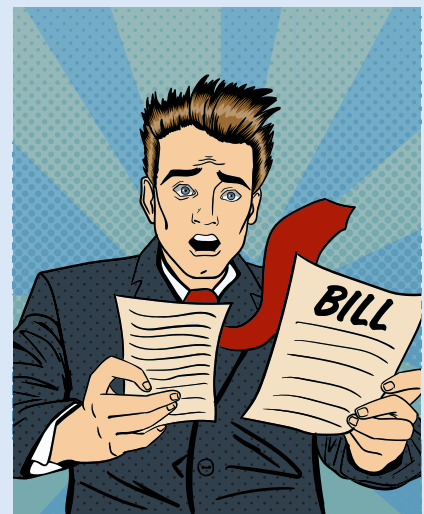
Like online accounting software tools, media operators expect to pay for management systems based on features, or even user 'seats' but will balk if pricing is per transaction. Moving production operations to the cloud affords limitless scale but that should not limit the economy of scale and media operators should see the cost per transaction flatten out and fall at higher throughput volumes.

In recent years there have been many published comparisons between taking a CAPEX (hardware and perpetual licences) and an OPEX (cloud service) approach to production technology procurement. In most cases authors tend to present a clear winner one way or the other but the reality is more

nuanced and comes down to the business's operating model. The significant variations between the different types of SaaS model on offer, and specifically how these suit different business requirements, play an important role here and deserve more scrutiny.

We are great proponents of cloud and SaaS and, in our own procurement of business systems and infrastructure, the model has allowed our business to grow rapidly without taking on burdensome debt or suffering the distraction of equity investment. But our success has been based on careful assessment of the different SaaS pricing models on offer and how these align with our specific business requirements. Our advice is that medium and larger scale businesses, in particular, should engage directly with underlying service providers and factor in future growth to identify which model is right for your business.

The acid test here is that operational costs should fall with, not track, your business growth – and if the model on offer looks complicated, look out for the devil in that detail.



BaM LIVE!™

Find out more
at
www.theiabm.org



Virtual Awards event at 6pm GMT
on Thursday 9th December

Shortlisted entries for 2021 BaM Awards® and Annual IABM Awards

As this edition of the Journal went to press, we announced the shortlisted entries for the 2021 edition of both our Annual IABM Awards and BaM Awards®, the latter again being rolled into a single event this year rather than the previous two editions which would normally have taken place at NAB Show Las Vegas and IBC.

The shortlists have been selected from a total of more than 150 entries for the BaM Awards® – indicating the value that technology developers place on the recognition they confer. The BaM Awards® recognize innovation in each the nine BaM Content Chain® categories, together with a tenth award recognizing an outstanding project, event or collaboration. The panel of 40+ non-affiliated, expert judges is now evaluating the shortlisted entries in each BaM Awards® category.

There has also been a wide range of entries for the Annual IABM Awards – reflected in the quality of the shortlisted candidates.

The winners of both sets of awards will be announced at a **Special Virtual Awards event at 6pm GMT on Thursday 9th December**. You can reserve your free place at the Awards event [here](#).

“No one can have failed to notice the speed and quality of innovation that’s been powering the industry forward over the last year, but to see it all brought together in this year’s record number of entries has been a real eye-opener,” said IABM CTO, Stan Moote, who is chairing the judging panel. “We are again seeing genuinely ground-breaking innovations right across the BaM Content Chain® and the eventual winners will have to be absolutely stand-out; every shortlisted entry could be a worthy winner in its category.”



Annual IABM Awards 2021



The shortlisted BaM Awards® entries are:

CREATE

Canon – Cine-Servo 25-250mm lens
EVS – XtraMotion
Glensound – GTM E-Sports Interface
Grass Valley – LDX 150 camera
Veritone – MARVEL.ai

PRODUCE

Frame.io – Frame.io Camera to Cloud
Mo-Sys – Mo-Sys VP Pro XR
Salsa Sound – MIXaiR 2.0
VITEC Production Solutions – Autoscript Voice
Zero Density – TRAXIS talentS

MANAGE

Axinom – Axinom Mosaic
EditShare – Universal Media Projects
Skyline Communications – DataMiner Digital Transformation Suite
Synchronized – Smart-AdBreaks
Tata Elxsi – QoEtient

PUBLISH

CONNECT – APTmpX-Updates
Easel TV – StagePlayer+
Eluvio – Broadcast TV's First Major NFT Endeavor: The MaskVerse
HESP Alliance – High Efficiency Streaming Protocol (HESP)

MONETIZE

EON Media – Computer Vision and Real-time Brand ROI for Live Broadcast and VOD Contents Solution
iWedia – Ad insertion solution
Kaltura – Kaltura Advertising Suite
Prime Focus Technologies – CLEAR
Vision Cloud – AI-powered multi-frame rate conformance

CONSUME

CONNECT – Tagit Interactive
Media Distillery – Image Distillery™
Nextologies – Toober: What Live TV Should Be

CONNECT

Appear – Sports production reaches new heights with Appear's X Platform
Black Box – Emerald Gateway (EMD3000 GE)
Cobalt Digital – Indigo 2110-DC-01
Vizrt – Connecting the World with NDI® 5
Xilinx – Alveo U30 SDK

STORE

Ardis – Dual HA AVFSHead with the Ardis Virtual File System
Quantiphi – AI-powered Video Deduplication
Ryussi Technologies – MoSMB Media Edition

SUPPORT

ASUS – ProArt Display OLED PA32DC
PHABRIX – QxL - the world's most flexible and compact, feature-rich 25GbE UHD rasterizer
Telestream – Inspect 2110
Telos Alliance – Telos Infinity® Virtual Intercom Platform (VIP)

PROJECT, EVENT OR COLLABORATION

BT – 5G Edge-XR
Intel, Spin Digital, Globo – Olympic Games Tokyo 2020 Live Streaming in 8K, 60 fps, HDR over the Open Internet
Intinor, OTEK TV – Flawless coverage from Alaska to Anchorage
Rohde & Schwarz – R&S®THR9 high-power FM transmitters at the heart of Turkey's successful Camlica Tower project

The shortlisted IABM Annual Awards entries are:

Technology leader of the year

Andy Beale – Head of Engineering and Innovation, BT Sport
Ravindra Velhal – Global Content Strategist and 8K Lead, Intel Corporation
Ricardo Montesa – Founder and CEO, Brainstorm

Best Broadcast or media company of the year

beIN Media Group
Blackbird
Telstra Broadcast Services

Environmental sustainability company of the year

ATEME
Blackbird
Singular Live

Most inclusive company in 2021

A+E Networks EMEA
BT Sport
Dell Technologies



Rise: 2021 – the year of ‘firsts’

Although Rise has been established since 2017, 2021 has been a year of many ‘firsts’ with new initiatives and projects being launched.



Carrie Wooten
Managing
Director, Rise

One of the most significant developments has been the launch of the Rise Mentoring Programme in North America, this year supporting 20 women from across the region. Rise has seen the impact and benefit that mentoring can directly bring to women in the sector through its UK programme over the last three years and the North American programme is running with the same framework, with three key strands: the direct 1-2-1 mentoring, CPD training and fireside chats and then monthly meet-ups with all of the Mentees.

The camaraderie and support between the cohort of women is one of the main outcomes Rise hopes comes from the programme, so the women have an ongoing network of champions that lasts long after the programme has wrapped.

North American Mentee

“I was inspired by the diversity and ambition of the women I met as a Mentee. Their drive, passion for their job and the aspirations they shared were truly motivating. Not only did Rise promote a feeling of camaraderie, the program was also extremely clear that my career growth is my responsibility and gave me the tools to chart my course and take my next steps. I’m grateful to have been included in the program and excited to apply what I’ve learned.”

North American Mentor:

“I am in awe and inspired by how hard everyone within the programme has worked to grow professionally and personally. It is very clear that each of these women has addressed topics ranging from: work/life balance, challenges of work in the pandemic, self-confidence, networking, public speaking, and the list goes on. All of this, plus the additional effort that went into their participation whilst carrying on with their day-to-day commitments...Amazing!”

One of the key programmes of work that is central to Rise’s ambitions of creating a diverse and gender balanced workforce is the Rise Up Academy.

Rise believes that unless the industry significantly invests in children and young people then the dial of diversity will not change. In October this year, Rise delivered 16 hands-on workshops where the children built a 4-camera fly pack gallery and studio. The workshops reached over 400 children in three locations; Hull, Portsmouth and East London. To say that the workshops are life-changing sounds clichéd and perhaps a little over dramatic too. But I am confident that this is what happened with many of the students.

We worked with children aged 9 through to young people aged 18 years old. The format and structure did not change and the workshops were split into three sections; a practical lesson, where pixels, RGB and distribution of content were discussed. We then moved onto the central, practical, part of the workshop which is to build the gallery. Many students can feel intimidated by this when faced



with a diagram and a pile of kit (!), but once they realise they can plug the cables in and that makes the gallery work, the atmosphere changes. The final part is where the students run a short quiz show and we work as though in a 'live' studio. They are led throughout this process by a team of industry volunteers and we had 40 individuals from across the sector working with us throughout October.

The feedback from volunteers, students and staff has been overwhelmingly positive with a huge demand for the workshops to be delivered across the country – my inbox is full of requests! We had the pleasure of working with diverse students across the country and met some incredible young people and one of the joys of these workshops was seeing those students who do not normally engage in education, grasp the opportunity with both hands. Our challenge now is not to let them down and ensure that their next steps into higher education or the industry are clear and supported by the industry.

"In the rise up workshop, I had the rare and amazing experience of a lifetime as I had undergone a day that involved a detailed and mind blowing insight into the process of setting up producing a show in a fully functioning TV studio with 1-to-1 help of brilliant and well-versed team members, each with their own eye-opening stories about the world of media. This was one astonishing moment I will never forget, as it not only gave me deeper understanding of the creative industry, but also helped me shape my career choices in the sector." Xavier, Aged 17, Mulberry University Technical College, East London

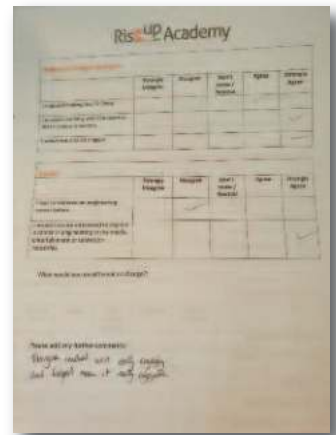
In November 2021, we also launched our first Women in Leadership Report, in partnership with the KTN. The report is the first of its kind for the media technology sector and provides an in-depth insight with recommendations into how the industry can encourage women to reach their potential and succeed in leadership roles.

Led by Peggy Rieckmann (Vubiquity) and Stefi Popescu (Sky), Rise developed an initial survey in early 2021 to discover if there were any specific trends that have led to women being leaders in our sector. The findings of this survey were then analysed, identifying underpinning patterns. This work has resulted in Rise's fully-fledged report, authored by Daisy Chapman-Chamberlain (KTN) which will help companies have a better understanding of behaviours, attitudes and support that can lead to

women occupying senior positions at companies across the globe. You can download the full report here:
<https://risewib.com/female-leadership-report-2021/>

In addition to the above work, Rise has also had a brand refresh and updated its website, of which one of the key developments has been the Rise Job Board, funded and supported by Moov. The aim of the Job Board is to encourage more diverse applications for engineering and technical roles across the sector. It will provide a valuable resource providing a library of international job postings and will also develop to add tools for CV and interview advice for women seeking more opportunities within our industry. It has been fantastic to see the Board being used so much already and we look forward to supporting the industry more to reach more diverse applicants in 2022.

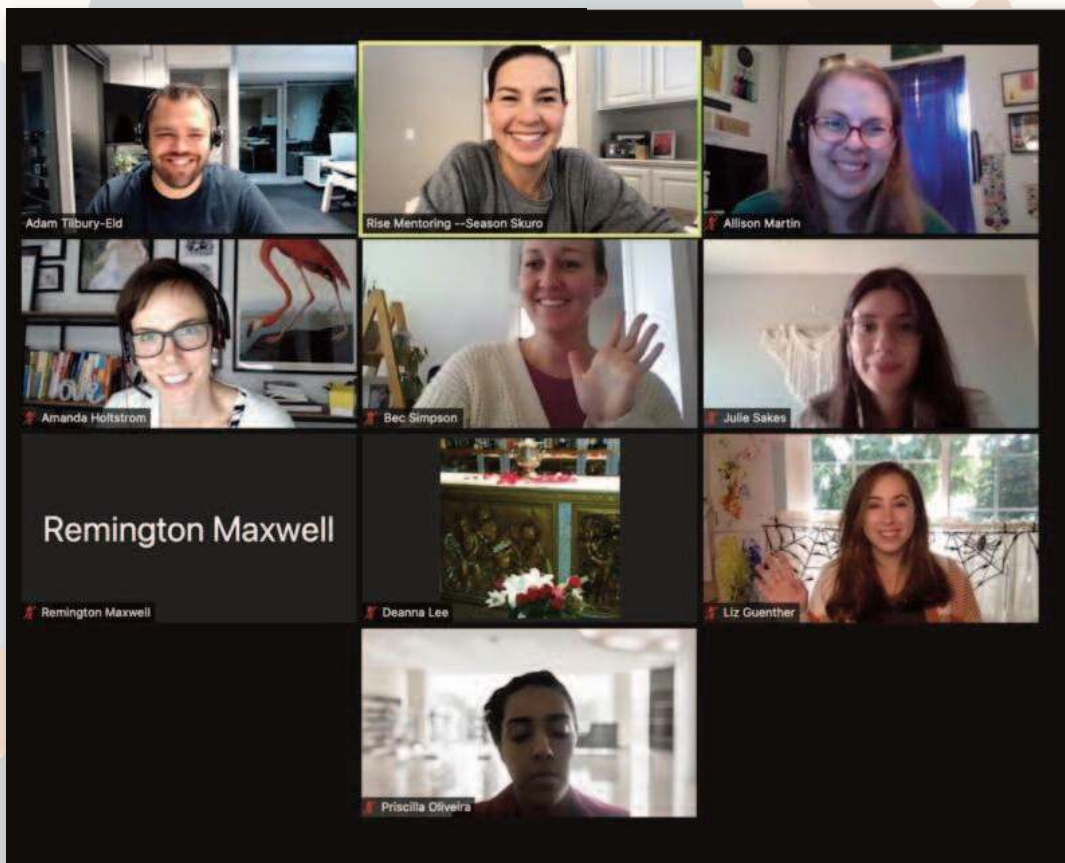
One exciting last development has been our first ever Rise Retreat. We brought together 30 of our 2020 Mentees and Mentors to a beautiful site in Lancaster, where we were able to network, connect and spend time in a gorgeous setting. The sun even shone for us. This dedicated time together was quite special, as no one had met face to face due to the pandemic and ongoing lockdowns last year and I really can't wait to plan our next one now.



These have been some of the key 'firsts' that we have delivered this year, but of course there have been other fundamental programmes that have continued throughout the year, such as the wider mentoring programme, where we are supporting 100 women in 2021 and of course our recent Rise Awards, as well as wider events and workshops.

The pace of the global advocacy group is moving rapidly and we are seeing extremely positive results. We are confident that there will be further international expansion in 2022, as well as other new initiatives.

There is still much to be done to achieve a diverse and gender balanced workforce, but Rise is working extremely hard to ensure that we achieve our goal.



The importance of reducing your carbon impact and the Quicklink advantage



Richard Rees
CEO, Quicklink

The reality of Climate Change

It's extremely hard not to hear about climate change, and rightly so. The IPCC (Intergovernmental Panel on Climate Change) published in a 2019 report that the worst impacts of climate change could be irreversible by 2030 – just over eight years away. There has never been a more imperative time to tackle this monumental issue.

With COP26 (the 26th UN Climate Change Conference of the Parties) taking place in Glasgow last month, world leaders, climate experts and campaigners came together to agree a coordinated plan of action to tackle climate change.

Subsequently, countries, corporations and businesses alike have been setting important and ambitious goals to become net zero or carbon neutral within just a few years. In October, BBC announced and set out a path to achieve net zero greenhouse gas emissions by 2030. This is just a single example of a plethora of organisations announcing their commitment to tackling climate change.

We all need to act

To avoid critical changes in our biosphere, crucial action is required to ensure that increases in our planet's temperature remain under a total of 2°C.

Climate change is largely believed to be caused by Carbon Dioxide (CO₂) emissions, and travel is a significant contributor. The United States Environmental Protection Agency found that transportation was the single largest source of U.S. greenhouse gas emissions in 2019, with light-duty vehicles and aircraft making up almost 70%.

Quicklink are committed to helping businesses reach their net zero goals by helping reduce the amount of CO₂ emitted. Quicklink's solutions provide a platform to gather high-quality remote contributions with the highest level of control – reducing the volume of

business travel needed while maintaining the same broadcast-quality that would be achieved in-person.

When gathering remote contributions using Quicklink Studio, the estimated CO₂ emissions avoided as a result of using the Quicklink platform are seamlessly calculated and displayed to both the remote contributor and Quicklink Manager operators. In addition, operators have the option to track, report and compare benchmarks, and identify important levers on carbon savings within a simple interface.

Within Quicklink's 'Reducing your Carbon Footprint: Protect our Planet Without Compromising on Quality' whitepaper, the sustainability challenges being faced by companies, and how the Quicklink solutions can assist, are further detailed.

Within the whitepaper, Quicklink calculated that since January 2020, over 445,460 tonnes of CO₂ were avoided as a direct result of customers using the Quicklink platform over having contributors travel to events or studios in-person. To put these results in perspective, a single tonne of carbon dioxide would make a humungous bubble over twice the height of a double decker bus – just imagine what over 445,460 tonnes would look like!

So don't wait – take action today to help the future of our planet. Talk to a member of the Quicklink team today, or download the whitepaper here.

<https://www.quicklink.tv/carbon-reduction/whitepaper/>

Within the whitepaper, Quicklink calculated that since January 2020, over 445,460 tonnes of CO₂ were avoided as a direct result of customers using the Quicklink platform over having contributors

Quicklink's results since January 2020:



517,975
contributions



445,460 tonnes
CO₂ avoided



1,336,380m²
sea ice saved



Evolving Media Economics

Interactivity and engagement are powering the transformation of our industry, and the effects of this are reverberating throughout media technology and content supply chains. The economics of broadcast and media are evolving rapidly – driven by the viewers dictating the terms on which they will engage with content. In the following articles, IABM ember companies tell us how their solutions are helping to drive this transformation as the industry moves to hybrid live TV/OTT business models, powered by the intelligent application of data, AI/ML, cloud, SaaS and streaming technologies.

Agile Content: How the growth of FAST has changed the channel creation game



Andy Hooper
VP Product Management,
B2B, Agile Content

After millions of people streamed more TV than ever during the pandemic, audience expectations have evolved. In addition to wanting more content to watch, they now expect to have access to an **even wider range** of online TV services. With decreasing attention spans and the growing popularity of personalised content, audiences want more choice and programming that's tailored to them.

One of the streaming service models that's helping TV providers meet audiences' evolving needs is free, ad-supported streaming TV (FAST). FAST has quickly moved from an area dominated by start-ups and digital brands to the latest avenue for established media and entertainment companies. While it isn't necessarily an entirely new concept given that ad-supported TV channels have existed for a long time, FAST expands the model into the world of streaming where subscribers can stream ad-funded content for free.

And this isn't something that audiences mind doing. The vast majority (**81%**) of **consumers** would prefer to use a free ad-supported service than subscribe to another paid service, while 83% wish that paid streaming services offered a free, ad-supported option.

FAST enables TV providers to broaden their offering as they compete for audience share, attract new customers and boost revenue. Such a service can provide the lean-back online viewing experience audiences want, all while boosting advertising revenue. But for FAST to succeed, TV providers need to

guarantee impressions to attract ad buyers – and the key to this is quantity.

Changing gears

There are a number of benefits that come with increasing the quantity of FAST channels. These include building better relationships with ad buyers, extending reach into highly-segmented audience pools and enticing viewers with a more attractive and diverse offering. This last benefit is particularly important in today's extremely competitive landscape, where capturing the attention of new and existing customers is harder than ever.

Unfortunately, producing a large number of live linear channels can be an expensive and resource-intensive task if traditional broadcast technology approaches are used. For example, doing so in the uncompressed broadcast playout domain requires editorial and operational costs, along with a high volume of storage and distribution capacity. That's why it's important to leave behind the legacy systems and traditional production processes that exist today to allow for scalability, editorial control, and automation for channel creation.

As such, the approach of creating channels in the compressed OTT/HTTP domain is becoming increasingly attractive. By using an internet-native solution, TV providers can cut costs and capitalise on the internet as a production platform.

For example, the compressed domain enables TV providers to create a variety of thematic and regional channel variants that are targeted to specific audiences while reducing storage and distribution costs.

Operators can stitch either new live content or existing on-demand assets on top of a linear channel or 'empty' baseline and apply them to a variety of use cases – such as 'fan' or 'team' channels. This approach essentially creates virtual dynamic linear-type channels that provide a lean-back viewing experience while giving viewers access to additional content. In doing so, TV providers can attract new customers by offering a broader range of TV channels and gain new revenue streams by monetizing their existing assets through targeted advertising.

The majority (81%) of consumers would prefer to use a free ad-supported service than subscribe to another paid service, while 83% wish that paid streaming services offered a free, ad-supported option

Full throttle

The ability to create multiple channels that are targeted to specific audiences doesn't just empower streaming TV providers to extend their reach. It also lets them segment their audiences in ways that benefit advertisers. Functionalities such as playout-driven and server-side ad insertion enable personalised advertising, presenting an inviting investment as advertisers can better reach their desired audiences at scale – all while delivering the cost-efficiency of internet-based operations.

What's more, TV providers can enhance their relationship with ad buyers by selling ad space in various channels tailored to certain demographics, regions and personal interests. As a result, advertisers are

presented with the option to increase the relevancy of their advertising and, in turn, improve their ROI.

With audience expectations and preferences continuing to shift, the rapid launch of new and numerous FAST channels gives providers the ability to elevate their position in an increasingly competitive market. As well as remaining at the forefront of modern TV viewing habits and technology trends, it lets them build a fruitful business model that not only retains viewers but attracts ad buyers too. Channels tailored to specific audiences will be more likely to drive impressions, putting TV providers in the best position to capitalise on today's viewing trends.



ATEME: How to monetize an OTT platform

The television viewing experience has changed in many ways over the last few decades, with several trends that improve the quality of the experience (QoE). The most obvious one is the arrival of UHD and 4K content, which are gradually becoming mainstream and improving image quality.

But beyond that, we are now seeing truly customizable and personalized experiences. Viewers increasingly expect to see content tailored to their activity and potential interests. And the arrival of technologies such as Dynamic Ad Insertion (DAI) are making it possible to tailor not only content, but also ads to specific regions, households, and viewers.

Meanwhile, there is a growing appetite for content. Big household-name content providers are going the D2C route, such as Disney+, who have the opportunity to expand globally and reach billions across the world, with many eager to watch what they have on offer. But to do this, they need a global reach.

All these trends create new opportunities for monetizing OTT platforms, with a range of technological advances helping to make this possible.

To cloud or not to cloud

The first of these advances is the cloud. The need for a global reach makes versatility a crucial aspect of any OTT platform strategy. In fact, to be able to reach new geographical markets, an OTT platform must migrate to a hybrid infrastructure, blending on-premise and cloud capabilities. This enables providers to use the cloud to reach new regions, while relying on an on-

premise architecture when the cloud isn't available.

Open Caching and the CDN

Another major advancement is Open Caching, which transforms the role of the content delivery network (CDN). A CDN network generally caches content in various nodes across a specific region or country. But to send video to a different country, it will be necessary to access other CDNs.

Open Caching is an encouraging innovation for streaming in the OTT industry. It enables a network of interconnected caches intercommunicating via APIs. With numerous ISPs already running CDNs with caching capabilities, global content providers have the opportunity to go direct to consumer and partner with ISPs in different target markets. The technology facilitates a new approach in caching and delivering content, helping to reduce complexity and facilitate caching closer to the end user.

The opportunities for monetization lie in the ability for content providers to delegate traffic to Open Caching compliant ISPs. This has the added benefit of further enhancing the viewing experience. Accessing Open Caching nodes hosted in ISP networks on the edge of the network, typically close to the last

mile, enables providers to ensure that content retains its premium quality. Open Caching also enables market diversification, where end users can be reached in different ways and budgets can be more closely scrutinized. While Open Caching is an emerging technology, a major entrant into the OTT market, Disney+, is already trialing the solution.

The foray into 5G

5G brings better bandwidth capability, and this is key to the enablement of HD and 4K streams on a wider range of content thanks to one gigabit per second streaming. It is also key due to its support for higher-quality audio, such as Dolby Atmos, which adds to the overall viewer experience.

But beyond better images and sound quality, 5G makes multi-access edge computing (MEC) possible, pushing storage and processing capabilities further down the network and closer to viewers. It's here that the real power of 5G comes to life and personalization takes on a whole new meaning as it is no longer just about watching content; it is about making video part of a wider experience, linking the content you watch with social media, retail, and your community, and providing the interactivity and responsiveness that

Open Caching is an encouraging innovation for streaming in the OTT industry. It enables a network of interconnected caches intercommunicating via APIs.

viewers are used to in these other platforms. This way, viewers can feel on-boarded with a story that is bigger than the content itself, expanding on the monetization opportunities available.

Personalizing the experience

Currently, the offer is fragmented. There is too much content dispersed across too many services. One major frustration viewers face (and also one of the top four reasons for churn) is not finding what they want or spending too much time looking for it. So *imagine being able to reach viewers with the content they want, based on where they are* (at home or commuting), *the time of day* (morning or lunch break), *their preferences* (sports or news), *and the type of entertainment they ask for* (augmented reality or just a show). With 5G, content suppliers can adjust their offering, the content itself, and the surrounding experience, leading to a win-win situation with viewers who are fully engaged with the content, and suppliers who see *increased loyalty, reduced churn, and increased revenue*.

Pushing for personalization and dynamic ad insertion (DAI)

Beyond a MEC architecture, you need technologies such as DAI to offer personalized experiences that help to increase content value. With DAI, specific content can be replaced right before it reaches the viewer, which means that service providers can deliver personalized channels with content tailored to a specific viewer's tastes or interests. This increase in value to the viewer is likely to equate to them being more willing to pay a premium price to access it. Personalization of course also works for advertising. Using the same content-replacement technology, advertisements are replaced to tailor

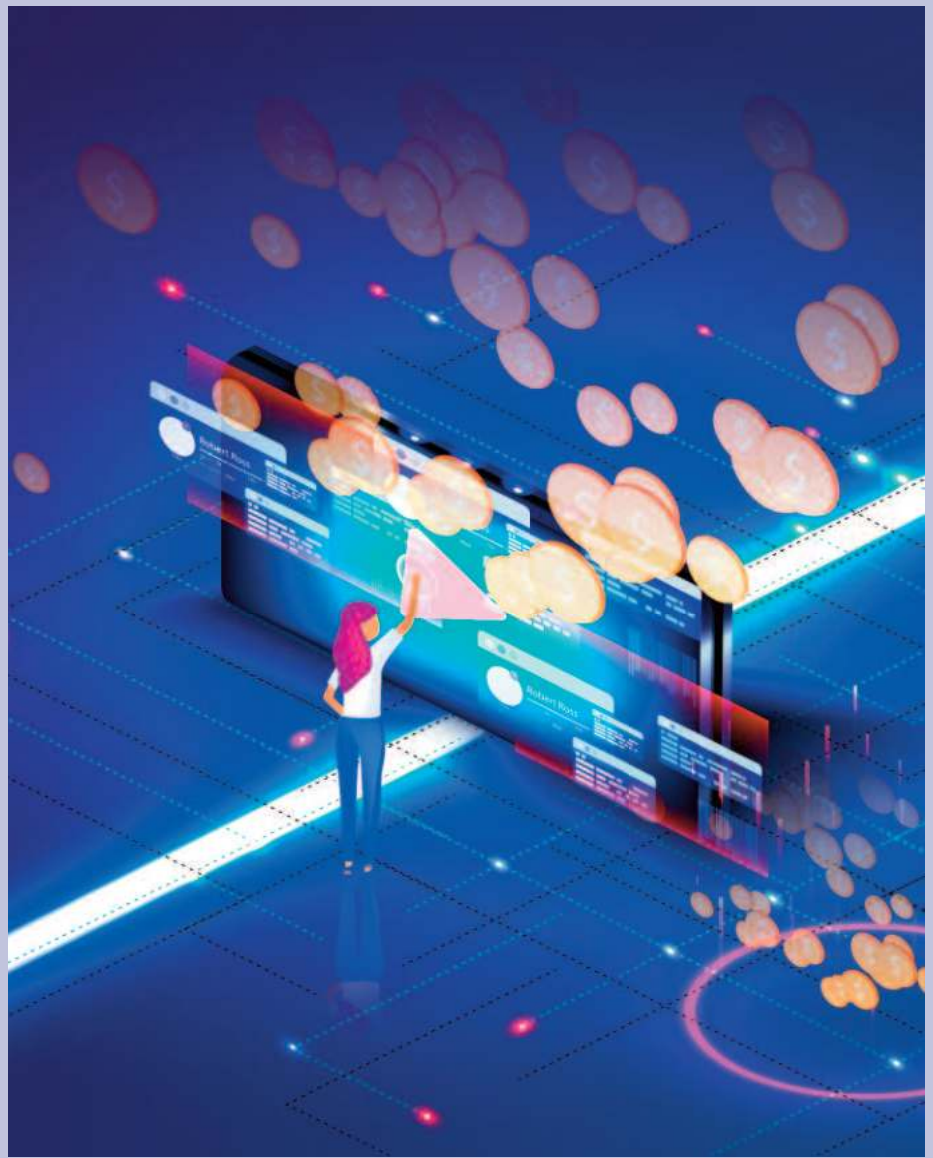
to specific people. This could be applied regionally, encouraging people living in a certain location to visit their local store, which is looking to attract nearby customers. This increases the value of the ad for the advertiser and thereby increases monetization.

DAI is also likely to play a key role in easing the issues created by OTT market saturation. End users are now overseeing a number of monthly fees leaving their bank account for every OTT platform they subscribe to. As a result, **more viewers** are turning to platforms with integrated advertisements to avoid accumulating too many subscriptions. OTT providers could employ a DAI strategy and use targeted advertising to offset a lower subscription price for end users,

making it more likely for them to sign up to a cheaper service.

Proving the value

A range of emerging technologies are providing opportunities for monetization of OTT platforms. Providing better video quality to end users is just the tip of the iceberg when it comes to enhancing the user experience and opening up new revenue streams. Now, OTT providers can empower their platform thanks to cloud infrastructures, Open Caching, Dynamic Ad Insertion and the emerging prominence of 5G, helping them provide personalized and customized services. Technology will play a crucial role in proving the value of OTT offerings in an expanding and competitive market.



Broadpeak: Overcoming Future Streaming Challenges



Olivier Karra
Cloud Solutions
Marketing Director,
Broadpeak

The video streaming industry is in the midst of an evolution, with several challenges facing service providers. Yesterday, service providers were focused on providing stable and robust streaming services. Today, they are looking to match streaming QoE with broadcast QoE, at scale. In the future, personalization and contextualization will be the norm, combined with a high degree of agility.

Keeping Up With the FAANG

Overall, staying ahead in this market means reaching the same speed of development as the FAANG. In finance, FAANG is an acronym that refers to five prominent American **technology companies**: Facebook, Amazon, Apple, Netflix, and Google. Because of their scale (tens of thousands of software engineers) and global footprint, these companies are setting the pace at an unprecedented level, which is extremely challenging for most other players to match. Without removing the need to innovate, leveraging the same kind of technology, tools, processes, services, and business models is therefore becoming key to remaining competitive.

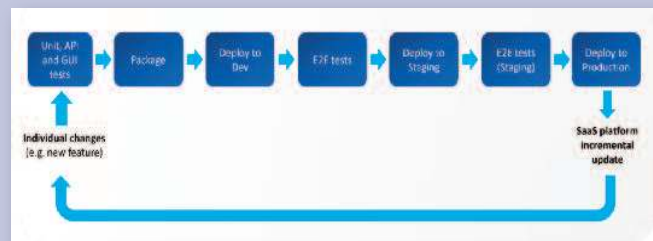
Overall, those challenges apply to all streaming service providers. Whether you are a content provider going direct-to-consumer, a programmer, an operator such as MVPD or ISP with your own cable or telco network, or an aggregator, you will be impacted at some point. The sooner you anticipate this, the less risk you are exposed to.

What Technology, Tools, and Services Can Make the Difference?

The following approaches are key ingredients to remain or to become successful:

- **AI and analytics** can help you anticipate needs, identify patterns, perform cohorts mapping, and make proactive changes
- **SaaS API platforms** allow you to easily outsource complicated projects, build your services on top of it, and leverage the opportunity to automate (almost) everything

- **CI-CD** aids in building on top of something existing and enables you to be in control in an agile way
- **A/B testing** is a great way for you to find your sweet spot leveraging end users' analytics



CI-CD aids in building on top of something existing and enables control in an agile way

What Does it Translate Into From a Business Standpoint?

Keeping up with FAANG speed basically means you need to answer the following questions:

- How can you shorten your cycles and make agility become part of your DNA?
- How to create more value faster for your customers?
- How to assess product potential very early in your business cycles?
- Identifying business models naturally aligned with this approach

A lot of the answers to those questions are pointing towards SaaS. Building streaming platforms on top of such cloud services basically introduces the ability to evaluate, trial, deploy and go to market within extremely short timescales.

Adding on-boarding, customization, operations, training and support services on top allows you to go one step

The key point is to ensure you are using a true API video platform as all the automation you may build in your workflows for applying provisioning, changes, and updates would otherwise be lost

further with mSaaS (managed SaaS). The TV industry is indeed too complex to be exclusively approached from a pure SaaS standpoint. With this context in mind, using mSaaS from companies who care can be a smart move, at least to secure key transformation phases or to accelerate go-to-market cycles.

In both cases, native continuous integration, delivery and deployment processes ensure a high degree of automation and adaptability for any service using such foundations. Those options basically represent very safe, rapid and efficient paths to build a streaming platform or to propose new services on top of existing platforms.

Here a few points to keep in mind. Although SaaS is the way to go for a growing number of use cases, it's important to avoid partners that will consider you as a SMB opportunity. For operators wanting to host and leverage such technology on their own infrastructure or cloud environment, a first phase based upon a SaaS or managed service can be seen as an accelerator, giving you time to study alternative deployment environment options. Operators wanting to migrate from one environment or ecosystem to another have the opportunity to smoothly transition and avoid duplicating infrastructure, even partial, with such SaaS-based services.

Applications as a Service

While 'functions as a service' SaaS are key components to build upon, 'applications as a service' SaaS integrate more value. They allow you to focus on how to create value faster and sooner without removing the ability to customize and automate your workflows.

The key point, in this case, is to ensure you are using a true API video platform as all the automation you may build in your workflows for applying provisioning, changes, and updates would otherwise be lost.



Managed services dashboard

Let's take the blackout use case as an example. In this situation, a linear feed with original content needs to be blacked out or replaced during specific time slots. It typically applies to some live sports events when a content provider's distribution rights are restricted.

Blackout Restriction

Sorry, this content is temporarily unavailable due to content rights restrictions for streaming distribution in your area.

You will be shown alternative content in a few seconds...
Stay tuned!

With the 'function as a service' approach, integrating a whole set of complex individual elementary services (e.g., manifest manipulation, audience logic vs. rules and policies, content preparation and normalization, etc.) can require significant efforts.

Blackout application as a service, on the other hand, allows you to immediately focus on more value-added features such as:

- Personalizing replacement content to improve QoE
- Monetizing eyeballs time during occultation slots
- Leveraging audience-based analytics to dynamically minimize churn
- More generally, be ready for whatever programmers or regulators may impose (example: FCC with EAS emergency alert service in the U.S.)

While the blackout as a service application has already been proposed by Broadpeak to a customer, it shows that building on top of cloud services puts the focus on what matters most.

Takeaway

While the streaming content offering has never been so plethoric, the need to differentiate from ubiquitous competition and to remain visible has never been so acute. Ultimately, anticipation of market evolution and shortening of product and feature launch cycles must be part of every streaming provider strategy.

API-controlled SaaS and managed services built on top are a very efficient means to quickly adapt and to automate advanced streaming workflows at scale. The cherry on the cake is that the risk is extremely low both from a time spent and from an investment standpoint compared with other traditional approaches.

Bottom line, although there is no unique approach, leveraging some of these application-centric services can be a game changer for your business.

To conclude with a concrete example, Broadpeak has joined the AWS SaaS factory program to go through this very transformation. With the peakVU.TV platform, Broadpeak is also in a position where it operates a white-label video streaming platform based upon its own cloud media technology. While every company needs to have its own strategy to tackle the challenges of transitioning toward DevOps, CI-CD and SaaS-based operations, the experience of building both API cloud media services, and a commercial streaming platform upon it, is one of the most unique learnings that Broadpeak has had, and we look forward to sharing it.

Deltatre:

APAC: What's the state of play and what's next for OTT in the region?



Craig Harvey
VP, APAC, Deltatre

Craig Harvey, VP, APAC, Deltatre reflects on the evolving OTT landscape in APAC, and identifies trends that will characterise the industry in the region in the months and years to come.

The pace of change across APAC for the streaming industry is dazzling, with an estimated 400m viewers using OTT services. Now is a good time to reflect on the last 12 months and, to look ahead to even greater growth across APAC, accompanied by new entrants, innovative content collaborations and emerging technologies to invigorate the market.

We should guard against thinking that one strategy fits all across APAC. Markets across the region can vary dramatically, from high ARPU countries like Australia with a population of 25m to India with low ARPU and 1.2bn people. But overall, streaming usage is up – undoubtedly fuelled by the pandemic – and the direction of travel shows no signs of changing.

That's not to say that establishing and running a service in APAC is easy.

While each market is nuanced – and understanding these are important – the core challenges of establishing a product remain similar to elsewhere in the world: building a frictionless experience that scales; acquiring and retaining users; strong content proposition; monetisation; etc.

Thankfully our experience around the world grants us a unique perspective on the varying challenges and our Strategy & Design Division work exclusively with organisations to clarify vision – no two platforms are the same.

Momentum continues to build

The transition to OTT continues to grow in APAC, with two distinct categories of platforms emerging: global and major locals.

As anticipated, the global platforms – Netflix, Amazon, Disney+ and YouTube – dominate market share (excluding China). Collectively they capture at least 60% share of the market revenue (AVOD and SVOD revenue) – in some countries that share can be as high as 90%. The remaining share is largely captured by major locals like Viu, Nine, Wavve & Vidio, with telco deals typically anchored to the success of these local platforms.

China, given its scale and maturity, is typically viewed separately, with an estimated 54% share of the online video revenue in APAC – dominated by Tencent Video, iQiyi and ByteDance. These three giants are all in the top 5 platforms by revenue according to research by MPA, collectively grossing an estimated US\$10bn in 2020.

Room for niche platforms

However, that is not to say there is not an opportunity for niche content providers. There is space for such brands, like Shemaroo and HoiChoi, who differentiate through content specialisation, serving a growing user base of specific, tailored content in a way that major platforms (who are more horizontal) cannot achieve.

For these platforms, there is no expectation to challenge or usurp a

Netflix – they can be successful without 100m+ subscribers, by utilising their intimate knowledge of their audience, and making smart, calculated investments and distribution deals to ultimately own that space in the market.

Of course, challenges do remain for the niche platforms. While they have a unique catalogue proposition, it is widely recognised that the user experience plays a critical role in maintaining them. How do these platforms – with lower budgets than their larger rivals – bring to market a service with a quality of user experience that meets consumer expectations and prevents subscribers from churning?

Market dynamics – AVOD and SVOD tipping point

APAC has typically been an AVOD market, but the latest metrics suggest we are reaching a tipping point, with SVOD likely to overtake AVOD revenues (again excluding China) in the next 2-3 years.

AVOD consumption has increased during the pandemic, but weaker advertising revenue has impacted revenue streams. One would expect this trend to be reversed in time, but we expect even more competition for

every dollar - platforms that understand their users more comprehensively are therefore likely to be more attractive as they can provide the value back to the advertiser.

In parallel, we know that SVOD services also flourished over the past 1-2 years - with ever more entrants to the market as the transition to online continues. According to recent data from Statista, in 2021, China has over 300 million users. The second and third-biggest markets were in India and Japan, with 67 and 37 million users respectively. These absolute figures look large but fascinatingly the penetration per capita in these countries, and all other countries in APAC excluding Australia and New Zealand, is still sub-30% - leaving significant room for growth.

Advancements in broadband will continue to boost consumption, particularly within countries like India, Indonesia and Thailand. Here, partnerships with telcos will be vital for the local and niche platforms with restricted marketing spend and a need for billing technology given the limited online payment mechanisms. And the telcos will welcome the content as the global platforms do the reverse and seek to keep their content exclusive - for the exclusive ownership of the consumer and their data.

What's next for APAC?

As we approach a new year, it's customary to be asked, 'what's next?'. For me, the challenge of the question is less about what's next - I am sure everyone sees the trends that I talk about below - but more about how fast will change happen.

Web 3.0: The decentralisation of the ether - the so-called Metaverse - is the latest hot topic. While organisations might not be ready for blockchain, NFTs and enhanced VR in

2022, for certain these topics need to be part of our strategy sessions today. Irrespective of whether Web 3.0 will ultimately decentralise power - Web 1.0 and 2.0 had the same goal and we know the outcome here - the technologies will provide a wealth of opportunities in our industry in the '20's.

Content: With 2/3 of the world's population, APAC is hungry for content, and the market is expected to spend over \$1bn in 2022. English content productions will remain important but less so for local platforms, with Korean, Chinese, Hindi and Japanese content being critical for these platforms to compete. Such demand for content provides opportunities for creators large and small (independent). Much like the OTT platforms themselves, independent creators will seek avenues to distribute their originals, and so expect to see B2B marketplaces like Vuulr prosper.

Maturity: As markets mature, we expect to see higher-premium plans for the same content, but with users being attracted with fresh, innovative features and functionality, gamification and VR. In less mature markets, like Indonesia, ARPUs will remain compressed as the race for reach and scale continues.

Artificial Intelligence: The 'big data' revolution fuelled the rush for organisations to collect as much data as possible, often characterised by the 3Vs - volume, variety and velocity. Today the V's have expanded to include veracity, value and variability. While the term artificial intelligence (AI) is widespread, the understanding of how to deploy AI effectively is still new to many organisations, but its deployment is critical to address the new V's and having accurate, actionable data.

Betting: The global sports betting industry is penned to be worth \$200bn. We have seen in the West the impact of the US relaxing its betting laws, with it predicted to grow \$8bn by 2025. In the region, reports suggest that the illegal cricket betting market in India alone is worth \$150bn a year and growing 20% YoY. There are different trains of thought to the impact legalising betting would have in the region. If India (and others) do legalise it can learn a lot from the West, and build a framework that supports stakeholders in addition to growing the sport.

Remembering the fundamentals

Long gone are the days of playing a video through a web page and impressing the audience. OTT platforms today are complex ecosystems, distributing content in a paradigm that was not built for the purpose (like satellite and cable TV). Now, more than ever, media organisations need to collaborate in partnerships and embrace the journey together.

For many organisations, OTT in isolation is not the 'silver bullet' - OTT should be part of a strategy, not the strategy. Consumer-led approaches will triumph more than those that are the traditional stakeholder-led and being adaptive to the ever-changing consumer needs and habits, qualified through accurate, actionable data, will help ensure longevity.

And finally, if you've skipped to the end and missed everything above then don't panic, as no matter where in the world you are looking to launch an OTT platform, know there is one golden rule applicable for everyone: the video must play.

Densitron:

Why the 'as a service' model provides the solution to economically uncertain times



Reuben Such
*Densitron Global Business
Development Director*

With customer requirements in greater flux and an unpredictable economic outlook, it's no wonder that OPEX-based managed services are becoming increasingly popular, writes Densitron Global Business Development Director Reuben Such.

If the events of the last 18 months have told us anything profound on a technology level, it's that the more versatile solutions we have access to, the better. From being able to connect with internal broadcast systems no matter where you are located, to ensuring that there is sufficient capacity to support more intensive use, responsiveness and accessibility have been in greater demand than ever before.

So, it's no surprise that the 'as a service'-style offerings that have been widely adopted in broadcast over the last few years experienced a further increase in popularity during the pandemic. Giving customers the opportunity to both devolve responsibility for specific aspects of a workflow to a third-party specialist, and to save money by only paying for what they actually need, such services have struck a chord during a period when so many businesses have faced unprecedented operational challenges.

It is our opinion, however, that the benefits of managed services are such that they will resonate with even more user groups in the years to come. It was certainly with this

sort of 'long view' in mind that we made our Intelligent Display System (IDS) available as a managed service in August 2020. IDS combines proprietary hardware and software allowing broadcasters to connect, control and automate devices and activities in and around the studio. Developed to make the use of IDS more cost-efficient, IDSaaS (IDS-as-a-Service) is based around the same solution and services but is provided instead at a fixed monthly cost.

The idea with IDSaaS is to cover all aspects of implementing and operating IDS. Consequently, it encompasses everything from design, hardware and software to ongoing support and backup. Customers can sign up for a determined time period – with two years proving to be the most frequently selected duration to date – and can also scale their use of IDS in line with the changing demands of their business.

From a vendor/service provider perspective, it has been extremely interesting to observe the reaction to IDSaaS over the last 12 months. There has certainly been an encouraging level of take-up from larger organisations, both in the

public and private sectors. But there has been even more interest from smaller- and medium-sized operations – companies who are having to simultaneously react to immediate changes in circumstances and prepare for the next economic cycle.

Managed services reach maturity

That last point is crucial as there is no doubt that the opportunity to move from a CAPEX (capital expenditure) to OPEX (operational expenditure) approach is of fundamental importance here. CAPEX investments traditionally involve a longer decision-making process in which the final call may be made by a company board or finance director. With OPEX it is easier to classify investments as regular operational outgoings that can be actioned more quickly. The latter approach is going to be more appealing to the technical services departments of many companies who wish to make changes without sparking a lengthy internal discussion.

Viewing all this from a vendor perspective, it's also apparent that OPEX is bringing intelligent display control within the reach of a new



group of users who might have felt unable to invest in a comprehensive system up-front. Examples here might include community radio stations or educational facilities that provide broadcast training.

And there is another reason why managed services are now achieving a broader market maturity – ease of deployment. There is no need to recap here in great detail about the reasons for broadcasters moving more and more of their infrastructure into the cloud but suffice to say that a lot of them have flexibility and efficiency at their core. It's also true, however, that companies are migrating to the cloud at different rates – for instance, some are taking a phased approach in which certain core functions are moved across at

first, with plans to transfer other elements at a later date.

In recognition of all this, one of the big changes we have made to the IDS platform recently is to allow it to be used more flexibly. That might be as part of a cloud-based deployment, on-premise or at someone's home, or in some kind of hybrid approach. Consistency of experience is paramount, and with IDS it's as easy to cover all those core day-to-day aspects – e.g., clocks, tally's and some DMX functions – at home as it is in the studio control room.

The nature of investment cycles means that CAPEX will continue to be the dominant approach at some of the larger broadcast organisations, but elsewhere we can confirm that demand for managed services is

continuing to accelerate – and that applies just as much to non-broadcast sectors such as houses of worship, where we have registered huge growth in the US recently.

With the certainty of being able to access support whenever it's needed, we expect managed services to carry on growing as we move out of the pandemic. Whilst it will take a while for the market to recover its pre-Covid lustre, we are already seeing some green shoots turn into saplings, and that is definitely encouraging! What's more, we have no doubt that IDSaaS is going to be integral to our next phase of development as a company which has always put customer responsiveness at the top of its agenda.

Flowics: Live Broadcast Graphics in Minutes: A Graphics Platform for the Cloud Age



Gabriel Baños
CEO & Founder,
Flowics

In the fast-paced world of live video production, broadcasters and OTT providers are always looking for ways to accelerate their workflows while controlling costs. SaaS-based solutions are just what the doctor ordered.

The benefits of SaaS for the M&E industry are well-known: flexible pay-as-you-go or subscription-based pricing, no capital outlay or maintenance costs, continually current software, and the ability to scale up and down as needed (to name a few).

And they are a perfect complement to the cloud-based workflows that are becoming more common in broadcast facilities today. We created Flowics Graphics – a comprehensive cloud-based platform that powers remote and in-studio production of live graphics and interactive content for linear and OTT broadcasters – to be just such a solution. Flowics Graphics is simplifying the way broadcast graphics are designed and managed for broadcasters and content creators of all sizes (and budgets) and for any production workflow.

Because of the platform's simplicity, broadcasters and producers in the sports, media, and entertainment industry can create, manage, and deploy cloud-based graphics in a matter of minutes. And they can quickly launch new live productions or cloud studios from any location without making big capital investments in equipment.

We designed the solution with three key pillars:

- **Audience engagement:** Increased fan engagement is one of the many benefits Flowics Graphics users get from the platform. The system offers built-in support for working with social media content and for customizing poll widgets, which makes it simple to incorporate social media participation and second-screen solutions.
- **Live data integration:** Flowics has integrations with a growing list of data providers – such as Stats Perform, Sportradar, and The Weather Channel – and offers native data connectors that make it possible to easily incorporate live data into any broadcast graphics package.

- **Workflow integration:** Flowics also has integrations with several different providers for NDI, SDI, and cloud-based workflows. These include cloud playouts, cloud production tools, switchers, etc. The list of partners and integrated solutions continues to grow.

Flowics Graphics works with all leading production software and appliances. Producers and graphic designers can operate Flowics Graphics from any location through a single control platform that integrates graphics with any web-based production tool.

While the platform was designed with a cloud-first approach, it can also adapt to more traditional or on-premises workflows to help broadcasters in their transition to cloud. Flowics understands that this transition will not happen overnight, so the company works with its clients and partners to provide the tools to make the migration as seamless as possible.

Linear and OTT broadcasters around the world rely on Flowics Graphics to create and remotely operate live graphics and interactive experiences for social media, broadcast, live streaming, websites, apps, or venues.

For example, Colorado-based Boulder County Communications Live (BCC Live), a live-streaming and virtual production company, used Flowics Graphics to help generate real-time, data-infused graphics while covering the Mainova IRONMAN European Championship Frankfurt triathlon. With the competition being broadcast on linear television in Frankfurt and nearby areas and live-streamed to U.S. audiences on Facebook Watch, the production team wanted to streamline operations as much as possible.

Flowics also helped BCC Live manage complex details, such as synchronizing with the competition's timing system and the live feed from Frankfurt. To make sure the data was properly synchronized, BCC Live and Flowics used API Connector to keep a running tab of data through Google Sheets, one of the many data integrations Flowics provides. Flowics was able to push data from the Google Sheet into the required graphics. Other than supplying real-time data to keep viewers updated during the event, the graphics also prompted interaction by asking questions in the live chat within Facebook Watch.

In another case, the BetQL Network – a live, linear digital channel – chose Flowics for quick-turn, scalable data and graphics integration for its new live sports betting shows airing on Twitch, YouTube, and the Audacy and BetQL digital platforms. The BetQL Network implemented the Flowics Graphics module and the Flowics Sportradar Data Connectors into its workflow. The graphics module makes it possible for network producers and graphic artists to create cloud-based HTML5 graphics rapidly for their digital shows on Twitch, while the Sportradar Data Connector feeds Sportradar's live betting data from multiple sportsbooks and live sports statistics into the Flowics graphics engine.

The native integration of Sportradar APIs into Flowics removes any need for custom development and abstracts the complexity of data feeds, which is handled internally by the Flowics External Connectors architecture. The combination means the BetQL Network can show its viewers clear, up-to-the minute odds and probabilities that help them make betting decisions.

Unlike traditional graphics solutions, the cloud-based Flowics platform allowed the BetQL Network to get up and running quickly, with the flexibility to manage graphics across a distributed team in a scalable way. The BetQL Network also gets the benefit of remote production support and data integrations that are ready to go.

One final example is ESPN Latin America, which, like most sports broadcasters, places huge emphasis on being able to deploy data in a smooth and seamless way during live broadcasts. ESPN Latin America turned to Flowics Graphics and its native Stats Perform data connector for SportsCenter+, sports news programming that gets transmitted on the weekends on the Disney OTT service Star+. The channel delivers 10 hours of live coverage per weekend and includes extensive news content.

For the format of this channel, a left bar overlay is visible at all times. Star+ is using the Stats Perform connector in conjunction with Flowics Graphics. This combination makes



it possible to display a wide variety of data during live transmission of sports events, including game score, fixtures, top scorers, league standings, and match stats. Thanks to Flowics Graphics and its live integration with Stats Perform, ESPN Latin American can easily satisfy the escalating demand for sports data and bring invaluable context and understanding to its sports coverage.

Those are just a few of many examples of how broadcasters and OTT providers can use Flowics Graphics to easily streamline their production workflows and add a layer of interactivity to their programming. Live production no longer needs to take place in a studio, and Flowics allows for a simplified approach to production workflows using cloud-based graphics.

iWedia:

How will technology continue to push changes in OTT in 2022?



Jérôme Vial
Business Development
Director, iWedia

The world of OTT has seen a rapid evolution in the past years, and the Covid-19 pandemic only accelerated this growth as access to news and content became the unconditional form of entertainment to many households during the most severe of lockdown restrictions. There is a clear evolution towards a free, ad-supported TV service, and as the world begins to turn the page towards a new normality for 2022, operators face a number of challenges to engage and retain their customers in a crowded market.

The vast complexity of systems needed to deliver a quality OTT service should not be underestimated, so operators should look for companies, like iWedia, one of the leading providers of software components and solutions for TV devices, offering global expertise that can help demystify and simplify the process.

According to iWedia, a key area that TV operators must address is the added value they bring to customers. With the increasing influence of streaming platforms such as Netflix or Amazon, operators have increasingly become a 'shop window' for many streaming platforms, and the challenge at stake is that they must succeed on their added value and relevance to their customers' needs; it is all about the quality of the user experience (UX). Customers do not want to be swapping platforms to search for content, and there is an increasing demand for fast and simple content aggregation from all platforms. The value for operators here is to enable customers to search across multiple platforms in one 'click' to find that film or TV show.

Along similar lines, operators should also make sure they are providing a comfortable, painless user experience to their customers. A well-designed interface with easy commands and simple to use search functions will reward operators with engaged and loyal customers. With the growth in the market for voice assistants, it would also be valuable for the operator who pushes its own device in the household to provide a reliable and resilient voice command solution.

Technologies are available today to develop smart a User Interface (UI) which will adapt over time to the

user's profile and behaviour. Users will not realise that they are having a good experience, but they certainly know – and act accordingly – when it's a bad experience.

An efficient recommendation engine is also a very valuable service. Obviously, some very good progress has been made in this field in the past years and as the data grows, the recommendation engine improves over time. Despite this, users will still get random and possibly strange 'recommendations' made by streaming services! Operators need to use content metadata, even live content and



customer profile data, and use technologies such as artificial intelligence to determine viewing preferences in order to provide more accurate recommendations, which are welcomed by customers.

Another big challenge for operators is how to enable new revenue streams and diversify these. The major trend in this aspect is turning to targeted ad insertion. Originating in digital advertising, this new technology directly solves the problem of diversified income sources and creates new revenue streams for many operators. Although it is undoubtedly a highly complex technical task, it is an excellent opportunity for operators to differentiate themselves from international streaming platforms and create new lucrative sources of revenue. Likewise, user experience will be the key to making it a reliable value. iWedia's cloud-based Ad Insertion Platform vastly simplifies the process; with the choice of client-side ad insertion (CSAI) or server side ad insertion (SSAI), the solution seamlessly replaces ads in live, catch-up and archived linear TV broadcasts, using individual targeting profiles and WEB-advertising technologies including real time bidding and return-path data. iWedia acts as an integrator at every level of the project implementation, speeding up time to market and lowering the cost of entry.

Free, ad-supported TV services is a growing trend that will be able to push more content to end users. It presents a great opportunity for platforms which will be able to become more relevant with these new models and services.

Naturally, these UX elements and value-added services require significant technical integration at the back-end, and iWedia is looking forward to seeing how this exciting trend grows in the coming months and years.



Live News and Sports Systems: Cloud natives avoid being held to ransom



John O'Loan
CEO, iOMedia
Group Limited

Was it Roy Thompson of Scottish Television who saw the dawning of commercial television in the UK as 'a license to print money' – or was it Lew Grade at ATV? It's been contested, but it doesn't really matter, because they and the lucky winners of the other, early tv licenses, were all right – back then.

But as Moses Znaimer, the Canadian media visionary was to lament 20 years later, "yes, but first you have to get your license."

Certainly, times have changed. You no longer need to have a much sought after broadcast monopoly license of the type afforded to Thompson and Grade in Britain and withheld from Znaimer in Canada, or the many other would-be broadcasters around the world for many decades. As Lew Grade's nephew, Michael was to find when he was the CEO of the successor to ATV, Scottish and the other U.K. commercial broadcasters at ITV, a license no longer guarantees the "rivers of gold" it once did (also ascribed to Roy Thompson at the time).

So what has evolved in media economics and what keeps changing? In a word "technology", because of which you now longer need a license, nor even a mountain from which to use it.

Let's just take a moment to look at where we came from, how we got here, and what that means in the financial evolution of the media.

Three major developments in more recent years have changed the world Thompson and Grade relished, and Znaimer hoped for.

We'd learned to cope with satellites, digitization and broadband, all of which offered never before dreamt of bandwidth for unlimited numbers of media channels and receiving and interactive devices.

But just when we thought we were learning to cope with the financial and business opportunities being created, along comes the Covid pandemic. The worldwide need for lockdown sent audiences for old fashioned broadcasting and newfangled streaming sky high, to record levels. It also sent us headlong into "remote location production". Particularly for news media, this in turn is resulting in a reappraisal of the high Capex, long

amortization lifecycle of the technology needed. We are moving from a Capex world to an Opex lifestyle.

Covid caused a world panic like no other. As in previous mass social upheavals, such as wars and panic stations, necessity became the mother of invention, and adoption of technologies such as "the cloud", which may have otherwise taken another cycle or two to catch on, were hurriedly pressed into use.

Change specialists teach that there can be no systemic change, or evolution, in any system, unless there is a well understood belief that change is in fact needed. Soaring use of media, coupled with a never expected plummet in media revenues, mainly due to a fall in advertising and marketing activity, forced the reality that changes needed to be made – and they are.

Often this required expedient, temporary "fixes" to cobble together legacy technology as best as could be achieved for remote operation or changed production and distribution circumstances. We're now starting to realize those changes which we may have anticipate as being "temporary" are actually becoming the "new normal."

WARC is a file format for the long-term preservation of digital data. As brands and media operators shift their marketing and distribution strategies from temporary adjustment to permanent transformation, the recently released WARC Marketer's Toolkit 2022: Global Trends Report, which brings together insights from a survey of 1,500 global executives, reports that, "Far from signaling a return to normal, the opening up of economies emerging from lockdowns, has only created a new set of challenges for marketers. Attitudes, behaviors and market structures have resulted in significant change



during the pandemic. With vaccination rates rising, many parts of the world are starting to see a return to what we used to assume was 'normal'. However, even in these markets, consumers are rethinking and evaluating lifestyles, resulting in different behaviors, preferences and patterns in their use of media and technology.”

The international media research giant Kantar can also detect that the video streaming subscription model, which rose mightily during the harsher parts of the pandemic, is starting to lose its power to drive long-term growth. In its latest Media Trends report, Kantar forecasts that the fight for audience numbers will drive a further diversification of business models in 2022, with a sole subscription offer becoming scarce. Kantar predicts further industry consolidation as platforms seek to offer more and better content.

Technology is giving consumers exponentially more news and entertainment options, and largely changed how people discover new content; which providers they get it from; and how they pay for it (if they pay, at all). As Kantar point out, the ultimate competition for media operators has become the one commodity that is no longer expanding: people's disposable time.

The research organisation Hub was set up to study the intersection of technology and entertainment. Three key trends emerged from Hub Entertainment Research's latest Conquering Content study, which

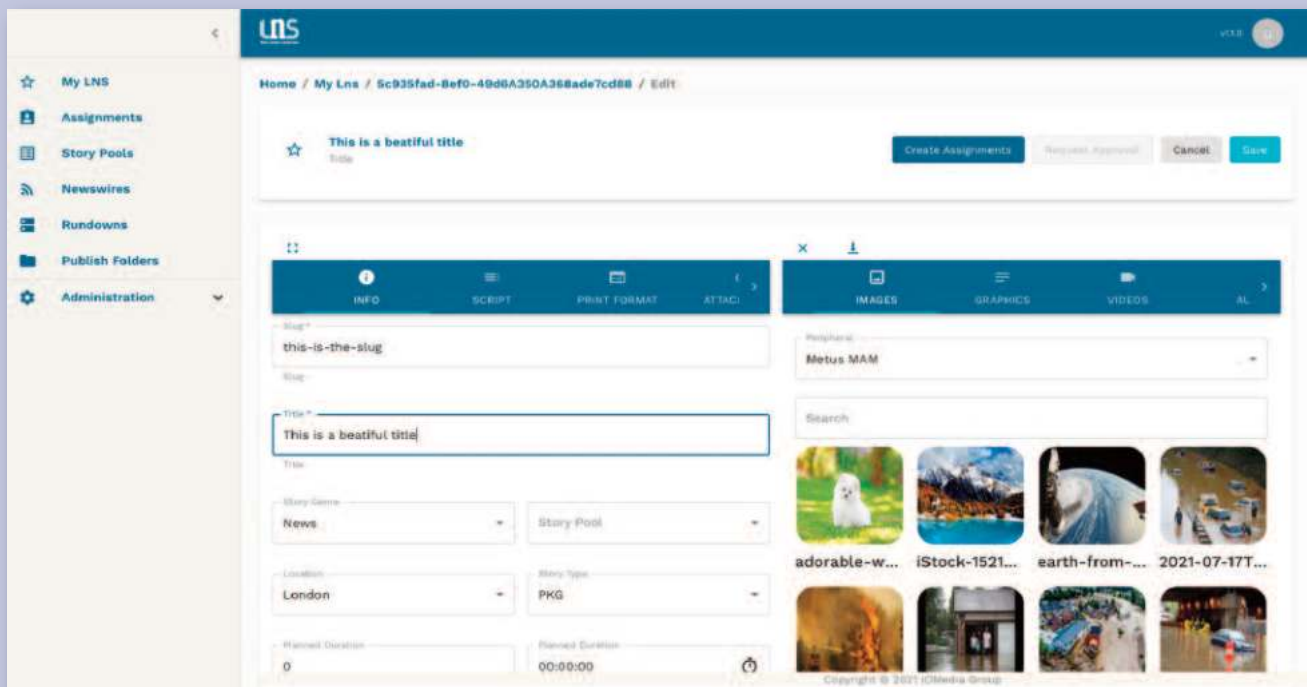
tracks how consumers discover TV content – and the platforms they use to watch newly discovered shows and movies:

The Hub report shows streaming's advantage as the home for favorite shows continues to grow. Consumers are now three times more likely to discover a new show on a streaming platform than on a traditional network. Among TV viewers who have discovered a new favorite TV show in the past year, 75 per cent say the show they've discovered is on a streaming service. Only 21 per cent have discovered a new favorite from a traditional pay-tv source such as DVR etc.

The proportion discovering a new favorite on streaming has increased every year since Hub have been tracking viewing behaviors, while the proportion discovering their latest favorite show on a traditional service has declined every year.

Another legacy of the COVID-19 pandemic is likely to be a fundamental and continued change to how and where journalists do their work – as well as a renewed focus on recruitment, retention, and diversity. It may not happen overnight, but news organisations are rethinking what the office is for and what kind of opportunities that throws up. Do they really need large production centers?

The Oxford based Reuters Institute survey notes that remote working has “made newsrooms more efficient,



and that many employees also value greater flexibility, but it is also clear that people miss the creativity, collaboration, and communication (3Cs) that is the lifeblood of any newsroom.” The key question, it says, is how to strike the right balance between those features. As many of the Reuters Institute interviewees noted, the hybrid future is about much more than just enabling any greater employee rights to remote working. It goes on, “In an ideal world, it describes a new operating model where work is done without reference to location, where talent is used more effectively, where hierarchies are less formal, and where diverse groups are included in conversations. It’s also likely to involve a greater amount of face-to-face contact with colleagues, whether that is just to socialize, reinforce company culture, or collaborate on creative projects.”

Some news organisations are just starting out on these journeys, while others are already some way down the line. All however are paying more serious attention to technologies such as the cloud, that only 18 months ago they may have been expecting to engage with in another 18 to 24 months from today. Instead, they’re evaluating and implementing – and using it – now, out of the combined necessities of reduced costs, regulatory changes allowing more amalgamation of once separate media units, reduced space and real estate requirements, cleaner environments, greater security from hacking and ransomware attack.

Another financial implication of the aftermath of Covid-induced and hastened media evolution is system security. “Hubbing” where the operations of co-owned media operators are combined in one location, is another development, brought about by regulatory changes in recognition of the fact that we don’t need to

restrict media ‘licenses’ in the same way, anymore. The Sinclair Broadcast Group is one of the largest owners of local TV stations – 184 stations in some 86 markets – and the largest owner of regional sports networks in the United States. On October 17th the company was the victim of a ransomware attack that took much of its local programming off the air, lost its commercial load and had data stolen from the company’s servers.

As media operators seek further synergistic interconnect, such ransomware attacks have added new financial and operational fears to the evolving media of today – and tomorrow.

At the iMedia Group Limited we believe the safest way around most of the issues the industry is facing is via the Cloud Native route. That’s why we are releasing the LNS Cloud 9 newsroom system at IBC 2021. You can see it in action at www.livesystems.io where you can also arrange for a private demo.

John O’Loan is CEO of the iMedia Group Limited, which releases the cloud native LNS live news and sports control system in Amsterdam at IBC 2021. He was responsible for the launch of Sky News and was also instrumental in the launch and running of Sky TG24 Italy, STAR News China, STAR News India, National Geographic Channels and FOX International Channels and as an independent consultant worked with more than 40 media brands worldwide.

He is a graduate of Culture Change studies at the University of Oxford and HEC Paris, co-founder of the Change Leaders Group and continues independent consultancy for media companies internationally, including NDTV India.

M2A Media:

Let's Work Together – How Strategic Alliances Are Facilitating The Advent of TV As A Service



Guy Taylor
*Head of Client
Services at M2A Media*

No, this isn't a paean to Canned Heat's "Let's Work Together", but it could be the unofficial theme song for an industry that is going through a major period of transition. The cloud, be it public or private, is increasingly becoming the locus of operations for broadcasters and there is an inexorable shift towards the acquisition of cloud-based services and products.

The cloud, in turn, provides a common platform to build these services upon. This common platform is further enriched by a framework of APIs and tools. This creates a technical lingua franca, where previously siloed products can effectively communicate with each other and opens up a universe of possibilities for collaboration. In addition, smoothing the path of collaboration, are broadcast standards, such as SCTE-35, SMPTE-2110 or CableLabs.

These common cloud-based architectures and broadcast standards continue to facilitate a growth in strategic partnerships between broadcast technology providers, who may have previously existed in isolation from each other. The outcome of these partnerships is a suite of complementary workflows, such as cloud-based editing software seamlessly feeding in public cloud based distribution services. The ease in which these formerly disparate services can interoperate with each other, which, had they been hardware, would have required miles of cabling and various discrete storage systems and tooling to move content around, is doing away with the need for expensive and time-consuming systems integrations.

This approach underpins the concept of TV-as-a-service (aka TVaaS, a pretty clunky acronym admittedly!). TVaaS is, broadly speaking, a set of cloud-based services delivering discrete components of a broadcast workflow and with the advent of TVaaS a broadcaster can now feasibly run an operation that is 100% cloud based. TVaaS allows a customer to choose best-in-class services that facilitate near endless scope for scalability, something which hardware could

only match through eye watering amounts of capex spend.

The AWS Marketplace is perhaps the most visible realisation of the concept of TVaaS. This October M2A Media joined an increasing number of vendors in the Media & Entertainment space on AWS Marketplace, to offer cloud-based SaaS broadcast solutions, ranging from playout to live streaming, acquisition and distribution, DRM, video analytics and much more. A new, greenfield broadcaster, on a constrained budget, could quite easily launch a service with technology acquired almost entirely via the choices made on the AWS Marketplace! Buyers through the Marketplace can be assured that vendors are AWS approved and warranted to provide high levels of service and reliability. Pricing is also visible and transparent, reducing the need for tortuous negotiations and contracting.

As the number of vendors offering TVaaS solutions increases, there is a greater need to rise above the flock to convince a potential buyer of the value you can bring to them. At M2A we are realising that not only will this be achieved by offering brilliant products, it will also be achieved via strategic partnerships. Our recent partnership with InSync and Hiscale is evidence of this. We have integrated their cutting-edge technologies into our M2A CONNECT product to launch the very first cloud based, motion-compensated live frame rate converter, which operates on a pay-as-you-use basis. Customers choosing M2A CONNECT for the global acquisition and distribution of their live content can convert frame rates as needed and at scale, a video

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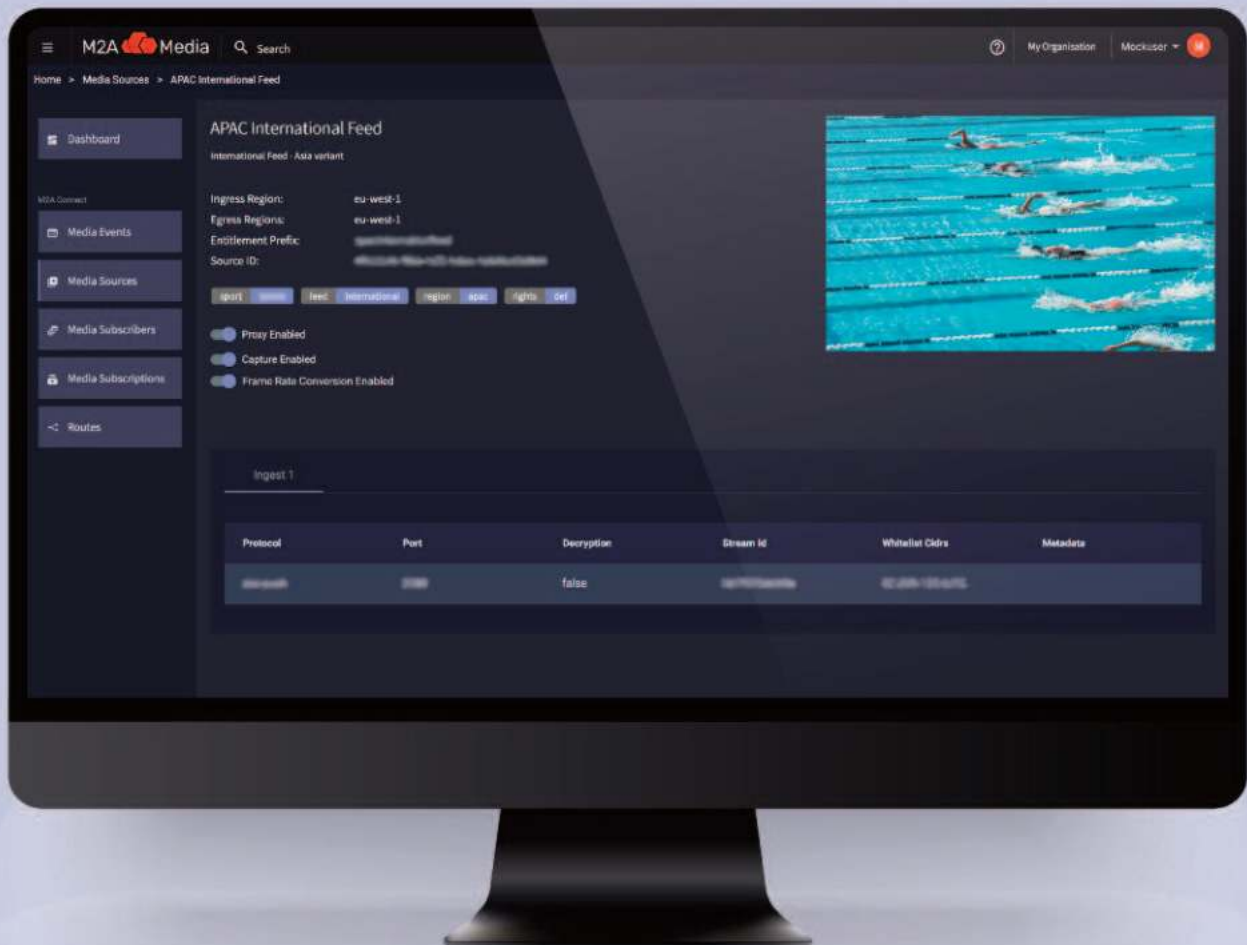
transition that was previously dependent on hardware. Another collaboration, this time with Ostmodern, means we can offer customers high-quality front-end solutions for their M2A orchestrated live content. Our partnership with AWS, via their Media Services and the aforementioned Marketplace, allows M2A to innovate at a pace that keeps our product and services, and subsequently, customers ahead of the market and able to meet the challenges of contemporary broadcast operations.

To recap, through collaboration we can deliver cross-vendor solutions and products that are proven to succeed. We can work together to assure the stability, security and reliability of our respective offerings. We can work together to deliver dynamic services at previously unseen levels of flexibility and choice. We can work

together to make buyers a compelling offering, that reduces the overhead of wrangling multiple suppliers together, but also frees them from the restrictions of contracting to a single vendor platform. Working together allows the sharing of mutually beneficial opportunities, which encourages growth and fuels innovation. Working together and facilitating the sharing of ideas and knowledge is to the wider benefit of the broadcast industry.

Amidst the disruption and isolation of the pandemic, we've all realised the value of kinship and collaboration. Here at M2A we are taking that on board and are looking forward to a future of strategic partnerships, alliances and, hopefully, a new friend or two.

Come on now people, let's work together.



Mediaproxy: OTT demands for viewer satisfaction



Erik Otto
Chief Executive,
Mediaproxy,

With more people watching films and episodic TV drama on streaming services such as Netflix and Amazon, OTT is coming ever closer to dislodging linear television as the dominant vehicle for video and media distribution. Mediaproxy chief executive Erik Otto outlines the technological challenges of this and looks at why monitoring streamed outputs is crucial to guarantee the viewing experience.

OTT services came into their own at the height of the Covid pandemic, providing streamed entertainment directly to people locked down in their homes. In reality, this was an acceleration of what had been happening in the years prior to 2020 and boosted the already growing popularity of streaming.

Originally, OTT was promoted as a video-on-demand (VoD) service that enabled viewers to catch up on TV shows they had missed. This model of streaming was expanded upon by the likes of Netflix and Amazon Prime to offer a large, readily accessible library of films, TV dramas and comedies shows. This was further enhanced with the addition of Ultra HD/4K HDR visuals and Dolby Atmos immersive audio to create a viable and compelling alternative to linear digital terrestrial television (DTT). Netflix and Amazon have since been joined by Disney+ and AppleTV (which added 4K capability earlier this year), with Sky in the UK dropping dish reception in favor of streaming through the new Glass TV.

VoD streaming, for both TV-style viewing and catch-up, is set to continue growing in the coming years. Many services are likely to be hybrid platforms based on subscription models (SVoD) but with the option of being ad-free. There is also an increase in demand for advertising-based VoD (AVoD). This offers free access to content with commercials and is popular in countries where mobile phone networks are the main forms of transmission rather than fiber circuits.

This form of delivery will increase as 5G roll-out continues round the world, offering low latency streaming and the ability to connect several different devices. Network operators are also likely to take advantage of what the new technology is able to offer, as



are traditional broadcasters. With streamed viewing now increasingly on an equal footing with linear broadcasting as the main way people watch video, the mainstream channels will launch their own OTT platforms, either independently or in conjunction with production companies and content owners.

The key selling point for VoD is quality of content but that should apply to the audio and visual standard as much as the excellence of the programming. That, coupled with more channels available to an ever-increasing number of platforms and devices, demands efficient and comprehensive monitoring of the streams to ensure both regulatory compliance and delivery to the right destinations.

Audio and video need to be tested as they pass along the distribution chain and through CDN (content distribution network) edge points. Due to the number of streams involved, this is a massive undertaking, made more complicated by the fact that attempting to monitor streams only in a standard master control room (MCR) does not make much sense in the multi-stream, multi-

Today, the business of monitoring outgoing channels is moving away from operators in the MCR looking at display screens and being replaced by an exception-based methodology.

channel world. Ideally, monitoring should happen at every point along the chain but in the OTT realm, controlling the material is difficult once it is being handled by the big service providers.

As a result, the MCR of a broadcast or playout center is no longer the final point for quality control. Video and audio have to be examined as they travel along the delivery path via CDN edge points and undergo various processes, including targeted ad insertion, multi-language selection and event-based transmission. It is crucial to fully manage this ever more complex process, which now requires logging and compliance checking. Monitoring the whole distribution path called for a brand new methodology. The aim is to go back to the more traditional system of starting with content 'off air' at the broadcast or playout center by creating something that can be virtualized and customized for individual requirements. Established detection methods, including time and date searches and predefined metadata, are still valid and used widely. But using more sophisticated software-based techniques, such as watermarking and fingerprinting,

operating under automated computer control, is now practicable.

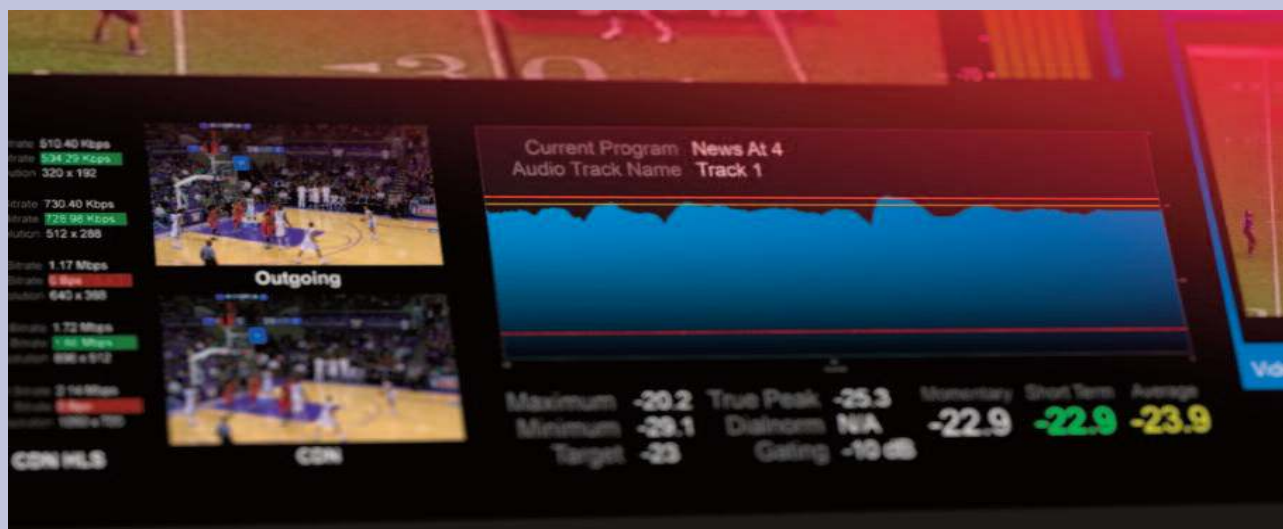
Due to the high number of OTT channels, many of which use adaptive bit rate (ABR) techniques, to be monitored, using display panels is no longer practical. There are now many devices and delivery platforms to monitor but viewers expect broadcast quality and the level of service to be the same as what they have been used to. Mediaproxy's LogServer compliance monitoring and analysis platform is able to check not only that the content of programs and commercials conforms to regulatory requirements for quality – including picture consistency and audio loudness – but can also assist in collecting information for targeting commercials at a particular audience.

The goal of broadcasters or content owners in today's extremely diversified and competitive OTT market is to ensure content is delivered to the quality laid down by regulators, with programs passing through the CDN to devices and platforms in the correct format. Mediaproxy's technologies provide

real-time monitoring of the output program so the broadcaster can be confident that what is being sent is correct in terms of both content and compliance.

Today, the business of monitoring outgoing channels is moving away from operators in the MCR looking at display screens and being replaced by an exception-based methodology. Modern MCRs will instead have multiviewers, such as Mediaproxy's Monwall, which only brings up a channel when something is wrong. The operators are then able to isolate any problems and deal with it using the tools provided by a compliance system like LogServer.

The advent of OTT has given people the freedom to watch anything wherever they are and whenever they want. Because of this technology developers, including Mediaproxy, have had to come up with new ways to make certain that the many streams now available meet the expectations of both viewers and regulators. This is an ongoing process and one that will continue to evolve as streaming becomes more dominant in the media world.



nanocosmos:

Interactive Live Streaming: How to Engage Audiences Worldwide

Over the past year, we've seen video communication on an unprecedented scale, from remote work to virtual conferences and live-streamed events like webinars and town hall meetings, theatre and music. Live Streaming, for both business and pleasure, has become part of our everyday lives — and this shift creates new unique opportunities. When physical meetings and events are cancelled, video communication is the only way to keep interaction alive. To share a live video stream with a global audience with access from any device, interactive live streaming comes into play.

What Is Interactive Live Streaming?

While live video streaming typically just delivers content in a one directional way, interactive live streaming allows the audience to participate and interact e.g. via chat, Q&A, polls. This also applies to bidding, betting or online gaming where interaction is mandatory. This is often referred to as a 'lean forward' experience compared to 'lean back' scenarios like watching an event via stream. In a lean forward experience, the audience is an active part of your content, having the chance to influence it. Especially during the pandemic interactive live streaming offered a new opportunity to connect with the audience and engage viewers.

However, there are technology challenges. For starters, latency (the time to deliver the stream 'from glass to glass', from the camera to the viewer) of an interactive live stream needs to be kept ultra low to maintain smooth interaction. This requirement applies on a global scale for any network. As most users are now using mobile phones as

their primary internet device, it is important to enable mobile-first easy access directly in the browser. For vendors, easy integration of live streaming into their web applications is important to focus on their business priorities.



Interactive Live Streaming with nanoStreamCloud

Some options, such as the advanced ultra-low latency live streaming platform nanoStream cloud-enables service providers to stream content to large audiences with almost no delay, while letting viewers interact in the most natural fashion, offering the closest experience you can get to actually being there.

Use Cases

On Stage Events: Town Hall Meetings, Podium Discussions, Cultural Events.

Adding interactivity creates new opportunities for performers and audiences to connect. This is a new milestone in user experience for live streaming. Event organisers are now able to host live concerts during which viewers can request their favourite songs, cheer, buy merchandise and interact in several other ways.

Besides, during the COVID-lockdowns, several new use cases from the business world emerged: A large corporation was looking for a solution to host town hall meetings and conduct polls with their employees at the same time.

Another company needed a project to be completed that had the mandate to inform the public and offer live Q&A to remotely connected participants. Without traditional hosting options, interactive live streaming was an inexpensive way of accomplishing audience engagement for these and many more scenarios.

To have a global approach, the live streaming workflow must suit a powerful and reliable Content Delivery Network (CDN)



Overview Use Cases



Hybrid Events Are Here to Stay

We are likely to see an increasing number of these events in the near future, because – if done right – they actually offer some key benefits over traditional platforms. Panel discussions provide a good example: panelists are not only live on stage, but also connected online. Scalable tech to stream events and meetings reduces the financial and environmental cost of travel as well as the individuals' attendance time. Additionally, when interaction is enjoyable and in real time through low-latency streams, these solutions allow for networking across the globe and truly multi-national meetings.

Monetizing Use Cases: Online Gaming, Auction and Online Retail. Ultra-Low-latency streaming is also the preferred choice for online live retailers and many auction houses and real estate sales agents to present their offers in the virtual world ensuring bidders enjoy the excitement of the experience even if they don't win the bid. Online gaming has increased drastically with the pandemic relocating entertainment – especially now with the legalization of online gambling in multiple countries.

Requirements for Successful Interactive Live Streaming

Latency – The Competitive Edge

At first it is all about how fast a stream can be delivered to determine what solution can be used for interactive use cases, but what is next? How to set-up an interactive live streaming solution successfully? For a successful business roll-out, the requirement that needs to follow is a clear understanding of the monetized business model. This determines other factors that come into play and that are part of the interactive live streaming workflow such as ingest, global network (CDN), player running on all devices and browsers, easy integration, robust service for 24/7 operation, requirements on the end-user's side (browser-based use, visibility on mobile etc.).

Latency depends on many factors and can only be achieved with full control and insight of all components of the live stream end-to-end.

One Shop Solution for highest Quality of service

The complex workflow of interactive live streaming asks for end-to-end control. Only then, all factors can be maneuvered through it according to the use case requirements. Mix and match of technologies can add a great layer of complexity to live streaming, besides that it can create streaming issues or increase the latency and time it takes to present content from the camera to the viewer. The easiest and most reliable way to live stream interactive content is adopting an all-in-one solution. This means that operators will have full control over their workflow: ingest, network, delivery and player and everything in between to keep the quality of service high. On top of that, businesses benefit from a solution that is easy to use and can be branded and integrated into business web sites according to the corporate requirements. For better insight and quality of service, data metrics and analytics help you monitor and analyze live stream

performance. A reliable service with instant live streaming 24/7/365 is mandatory with the goal of 100% availability and automatic failover in case of any network issues.

Leverage Low bandwidth on a global scale

To have a global approach, the live streaming workflow must suit a powerful and reliable Content Delivery Network (CDN). This means having an infrastructure that can deliver streams everywhere in the world. At present, many operators are taking a trial-and-error approach when it comes to the settings used for interactive live streams whereas they should be relying on modern technologies. The best solution will use ultra-low latency, adaptive bitrate playback to cope with all different types of network situations. It will also provide analysis of the live stream. Ultra-low latency ensures the delay between the presentation and the audience seeing it is well under one

second, while the adaptive bitrate playback handles changing bandwidth. It works by reducing the stream quality, encoded with a lower bitrate, based on the available bandwidth. As soon as the bandwidth improves, so does the quality of the stream.

Deliver interactive live streaming to desktop and mobile devices

One of the greatest challenges operators and providers face is ensuring that the best possible user experience is granted on both desktop and mobile, at all times without any plugins and accessible from any browser. This requires a robust live streaming platform and powerful technology.

Make it happen with the right interactive live streaming platform

Even though streaming is widely available today, not every solution is suited to delivering interactive live video experiences. Combining all

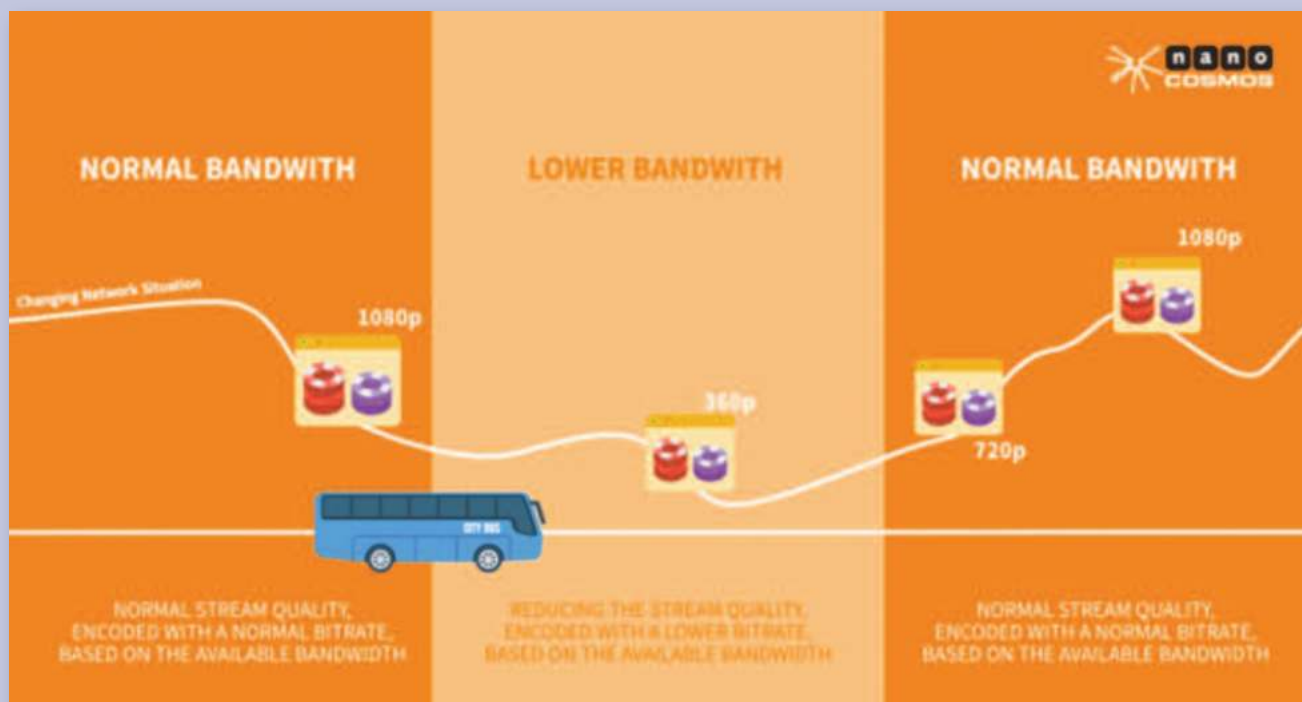
the requirements is challenging, but is the key to success.

Recently awarded by Streaming Media, nanoStream Cloud includes

all the necessary features to help businesses across several industries engage their audiences with interactive live video:

- Integrated solution and end-to-end control
- Easy to integrate
- Global delivery network (CDN) to deliver worldwide
- Player with Adaptive Bitrate Playback
- Running browser based and on all devices including iOS
- Integrated Analytics to improve customer experience
- Light weight, stable and robust live streaming solution

Questions? Reach out to our team at sales@nanocosmos.de to discuss your interactive live streaming use case.



Infographic Use Case Online Games: Bandwidth Adjustment

On-Hertz:

The future of media is unplugged: how digital transformation can prepare media brands for a new reality

A rapidly changing media industry

There is no doubt media convergence is happening. Audiences for linear television and media are decreasing slowly, and we expect a collapse in the near future as audiences shift rapidly from traditional to connected media. Using radio as an example, in the UK recent data from RAJAR (Radio Joint Audience Research) shows a dramatic 40% drop in listening hours by 14-19 year olds.

It is a trend mirrored in linear media across the board, and that shift has consequences for revenue. Ad spend is moving online, away from traditional channels. The latest report from Insider Intelligence, Worldwide Digital Ad Spending 2021, predicts that digital ad spend will reach \$455.30 billion this year, following a 15.7% contraction in traditional ad spending in 2020.

As revenues and audiences shift, media groups merge to benefit from economies of scale. This leads to increased media concentration and rationalisation. The borders between different platforms are slowly fading and media brands will have to ask how they will face this convergence by reinventing themselves instead of attempting to extract a little bit more from their existing model until it breaks.

Greater competition

Accessibility of technology is another driver of transformation. Where media brands used to have the best technology, nowadays everyone has access to similar technology at a fraction of the cost. The barrier to produce and distribute content is gone and everyone is able to reach large audiences. As a result, competition has exploded and new content is sent into the world every second of the day.

Currently, media groups are trying to face the disruption by focusing on lowering costs, but they are not doing so in a joined-up way. They are making incremental changes instead of systemic ones, such as downsizing technical teams. Eventually, stretching production resources to their limits has an impact on the core of media brands: the quality and amount of their content production. This cost cutting eventually leads to value erosion and damage to brand reputation.

Future proof media brands

The transformation is not yet over and no one knows where it will end. It's also unclear what business model will become dominant in this new reality.

However, two things are clear:

First of all, media brands will have to get closer to their audiences – that means faster throughput of the production, faster feedback loops and interaction with the audience, and the need to extend their reach over more platforms.

Live production will remain one of the greatest skills and differentiators for media brands in the future especially as they continue to recover and rebuild following the impact on live events of the covid pandemic. It is more difficult to produce, but offers great advantages:

- Live production creates direct engagement and interaction with the public.
- Live production saves time.
- Live production creates an ambience and a 'brand voice' that can differentiate media brands from their competitors.

Secondly, automation and robust workflows will allow media brands to focus efforts where they are needed: in building audiences and getting noticed – not in production. Quality and speed will be essential, but will not be enough to build a brand. The struggle is not simply to get content on different platforms, but to get noticed and to engage the audience, and to create continued engagement, thereby instilling brand loyalty. Furthermore, there is a need to produce more content at a faster rate, which can be published on different platforms without compromising on quality.

Media production: unplug or else

Media brands need to be prepared for anything. That means investing in a fixed and robust virtual backbone that gives production teams maximal flexibility. In other words: go digital and adopt "as-a-service" ways of working rather than investing in on-premise hardware. Without that adaptation, media brands are tied to solutions and technology that cannot be adapted to a fast changing environment. As a result, production teams will not be tied to places and processes, which allows them to react in real time to every new reality the future will bring. Of course, physical control surfaces will remain, but the intelligence and processing will be virtualised and distributed.

This new paradigm forces media brands to compensate for the downsizing of teams by introducing automation wherever possible. This reinvention needs to be natively digital rather than a replication of analogue processes (Digitalise v. Digitise).

The main focus of using a software is that the production achieves quality requirements regardless of what media brands do with the production result or on which channel they put it. The right software requires nearly no training, is painless to adopt and is the solution technicians need in the era of the smartphone. It will no longer be necessary to invest in hardware that is provisioned to handle peak needs (CAPEX) since software can scale up and down as needed. This results in cost savings and a cost structure that grows and shrinks with the activity.

There is no doubt that the future of content production will be unplugged. That is why On-Hertz adapt their business models to match the requirements of media brands: not only offer traditional fixed one-off licenses, but also SaaS and on-demand. That will ensure the budget remains predictable and in-control, but also offer the flexibility and scalability that is required.

About On-Hertz

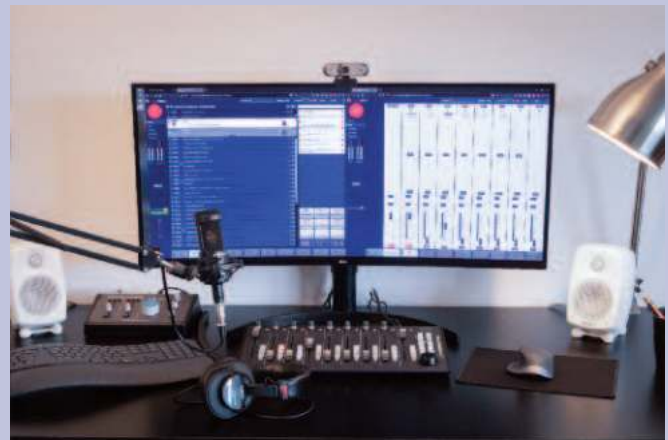
Audio production unplugged

On-Hertz brings media brands closer to their audience. We allow creators to go from idea to high quality content faster, live or pre-recorded, from niche podcasts to shows with millions of fans. On-Hertz audio-first software suite empowers you to break free from the limitations of legacy hardware environments. We build solutions and apps that are easy to adopt, a breeze to use, and offer full control over your final product.

On-Hertz is where the digital transformation of your media brand starts.

- Grow your audience by tapping the potential of live content
- Produce more content at superior quality
- Simplify and speed up your production process

Faster, better, more: the evolution your media brand needs.



Qvest:

IP monitoring in complex data transfers



Hartmut Opfermann
*Senior Solutions
Architect, Technology
Consulting, Qvest*

Digitalization has triggered a technical revolution among TV broadcasters too: with transfer rates of on average 100 Gigabits per second, huge volumes of data are nowadays coursing through broadcasters' fibre-optic cables. But with the move away from analogue technologies come new challenges for live broadcasts: even minor disruptions in data transfer over IP networks today quickly damage image - and cost money. IP monitoring puts programme providers in the picture.

Challenge with live broadcasts

When millions of people around the world were eagerly awaiting the first kick-off of the European Football Championship on 11 June 2021, probably only a few were aware of the technical developments behind today's razor-sharp live images. From the moment the ball starts rolling at the latest, the lines run hot in the broadcasting centers around the globe. This is because TV spectacles such as this major sporting event have long been down to a complicated interplay of digital IT technologies. This is especially true for live transmissions with transfer rates of ten Gigabits per second or more with Ultra High Definition (UHD) transmission quality. Then, during a regular soccer match, several Terabytes of data course through the lines of the broadcasting stations - and then the network infrastructure of the broadcasters also has to deal with 'kick and rush'.

Even minimal interference or even interruptions in the transmission of signals in real time can sometimes have a fatal effect on the broadcaster's reputation. Worse still, an involuntary disruption, for example during a commercial break, can really cost money. Unimpaired transmission quality is particularly relevant for crowd-pullers such as major sporting events - whether before, during or after a soccer match, for example. And

moreover, the reliability of TV transmissions is just as important as the content, and especially for live events, the transmission technology is a decisive factor if both image-damaging and economically burdensome consequences are to be avoided.

'Ghost match' during data transfer

A typical problem so far has been that the IP technologies adopted from the IT industry require monitoring of the state of data flows so that faults during the transmission of uncompressed live video signals can be quickly analyzed and remedied. Unlike in the streaming environment, where lost data units can usually simply be forwarded without affecting viewers, packets in a real-time transmission then run offside forever. But hardware defects too - for example in a switch, a cable or the laser in the fibre optic interface - then become a 'ghost match' for broadcast IT administrators. This is where IP-based network topologies come into play: in the past, the broadcasting industry used SDI technologies to transport a single unidirectional signal over SDI cables, but with IP-based transmission, multiple bidirectional data streams can be transmitted over a single cable. Among other things, this enables more camera feeds, higher resolutions, virtual reality functions and live production directly in the studio or venues.

IP monitoring: preventing wasted time with the right flow








IP monitoring solutions enable broadcasters to analyze flows in the wide area network (WAN) and thus improve troubleshooting. In practice, two different IP monitoring methods have become established: NetFlow and sFlow.

Netflow is a technology originally developed by Cisco in which devices such as routers or layer 3 switches export information about the IP data stream within the device via UDP. It is well suited for billing IP traffic on Internet routers. UDP datagrams can then be received, stored and processed by a NetFlow collector. This accumulated information can be used for traffic analysis, capacity planning or analysis in the context of quality-of-service strategies.

As a counterpart to this, sFlow (Sampled Flow) has become established in recent years. This is

a packet sampling protocol designed by the InMon Corporation that has found wide acceptance in the networking industry. The decisive difference to Netflow is that Netflow exports statistics, while sFlow exports sampled packet headers from which the statistics are generated externally.

sFlow can be embedded in any network device and provides continuous statistics on each protocol (L2, L3, L4 and up to L7) so that all traffic on a network can be accurately characterized and monitored. These statistics can be used for overload control as well as troubleshooting, security monitoring or network planning. The advantage is that this reduces the amount of information that ultimately has to be processed and analyzed. This leads to a low load on the CPU and the data line.

	NetFlow Cisco Systems	sFlow (Sampled Flow) InMon Corporation	RTP Flow Monitoring (Real-Time Transport Protocol) Cisco Systems	NBM Statistiken (Non-Blocking Multicast) Cisco Systems
 AVAILABILITY	Switches with Cisco chips	All IPFM switches (IP Fabric for Media)	Switches with Cisco chips	All IPFM switches (IP Fabric for Media)
 EXPORT	Statistics data	Package header of randomly selected packets (sampling)	Statistics data	Statistics data
 DATA FLOW (Detection) time	At the first packet Statistics are delivered only after the end of the data stream (or periodically)	When first package of the flow is selected (depending on the size of the data stream and sample rate)	On the first data package	When the flow is built up by the NBM mechanism
 DETECTED DATA FLOWS	All IP flows	All	All RTP flows	All NBM flows
 UPDATING	After the end of the transmission or continuously (every X seconds)	Continuously (depending on the analysis software)	Continuously	Continuously
 DATA FLOW (Removal) time (removal)	After timeout (for UDP)	After timeout	After timeout	When the flow is removed by the NBM mechanism
 DATA PACKAGE (Loss detection)	X	X	✓	X

StormGeo: Cloud-based technology taking weather by storm



Ragnvald Moberg
*Vice President of
Media, StormGeo*

For decades television stations, news channels and streaming services have had no choice but to rely on limited technologies to deliver the graphics that support the weather story. Finally, there's a solution that removes the complex technical and logistical difficulties and eases workflow; future-proofing the weather forecasting industry against rapidly changing technology and unexpected global events

Hardware Has Been Holding Weather Back

One of the most problematic issues facing weather programs is the hardware that has long been a necessary part of broadcast. With monolithic weather solutions, specific dedicated equipment and expensive on-premises infrastructure, forecasters have relied on an awkward, overgrown setup to provide their service.

The hardware solutions that have been the mainstay of weather forecasting since the 90s are fast becoming historic relics. They are costly, complex to run, and have an ever-increasing maintenance burden.

A Fragile Workflow

The classical systems require faultless integration between graphics, hardware and data sub-deliverables. From an operations perspective, there is potential for failure when multiple disparate elements are expected to perform seamlessly. When issues occur, the complexity of systems subcontracted to diverse and interdependent players makes it difficult to determine where the system has failed, and who is responsible for resolving the problem.

Data Challenges

Inflexibility within the system and the dataflow make traditional weather forecasting setups difficult to modernize. Specific skills and competencies from independent subcontractors mean that problems arise wherever platforms are not fully aligned, and as such continuous development is extremely complex.

With dated tech and bulky processes, there's little wonder that mainstream broadcasters can update weather graphics only every 5 to 8 years. Yet, they risk

losing out to competitors as expectations for user experience grow.

Add a Global Pandemic...

These problems have long been inherent in an increasingly outmoded system, limiting the flexibility and dynamic potential of the industry. But the Covid-19 crisis of 2020 has thrown the difficulties into sharp focus. Existing vulnerabilities were exacerbated as weather anchors were forced to deliver forecasts away from the studio environment, making technical support even more complex than usual.



A Solution on the Horizon

The traditional weather system is ripe for an update. Fortunately for the weather forecasting industry, there's now a simple, effective solution that addresses the current challenges and takes weather forecasting forward.

StormGeo Studio is a new model for the weather forecasting industry that completely removes the need for a complex system, and replaces it with an intuitive, all-in-one solution that future-proofs weather forecasting for a rapidly changing technological age.

Cloud Technology, Local Capability

StormGeo Studio is a system that uses a hybrid infrastructure. It utilizes new technology, making it easier to operate, maintain and continue to develop the software with well-known standardized technologies.

Using cloud services through the browser and rendered locally, all that is required is an ordinary computer.

In simple terms, the traditional hardware and intricate support network becomes obsolete. It is fully replaced by a PC or Mac. StormGeo Studio removes the need for specialist support capabilities by using standard, accessible technologies such as Javascript, HTML5 and WebGL. Graphics are overlaid on any stream, be that Over-The-Top (OTT) or fixed-line broadcast. It also provides a user-friendly interface for meteorologists to edit forecasts for any location at short notice, without needing to change individual templates.

This revolutionary hybridization of both local and remote resources creates effective and extremely robust performance capabilities. The process is fast and simple.

No Specialist Hardware

With only a computer required, StormGeo Studio is defined as an agnostic system – a system capable of full operation from any platform where Google Chrome or a headless browser is available.

StormGeo Studio's agnostic nature makes it easy to introduce, operate and get on air in a very short time for clients in all tiers, including content providers for whom streaming is a

new or growing platform. Producers and weather talents can use a well-known interface, with no need for specialist training.

With StormGeo Studio, staying up to date is no longer a logistical nightmare. Updates are versioned and easily accessible through the browser, removing the need to make allowances for the currency of local hardware or operating systems. The entire system is simplified and easy to maintain on a day-to-day basis. Continued development becomes a rapid and effortless procedure.

The trends all point towards further growth in IP-based or web platform and software solutions, rather than the monolithic setup that has been the mainstay of the industry. StormGeo Studio enables weather forecasting to move with the times, available not just to tier 1 broadcasters, but also to digital and OTT publishers.

Content-as-a-Service Model

Moreover, StormGeo Studio is a Content-as-a-Service (CaaS) model, with graphics, weather intelligence and playout bundled in one solution and provided with subscription options to suit forecasters' needs.

The subscription model not only gives clients control over costs depending on use requirements, but in removing reliance on subcontractors, the focus can now be on disseminating high quality weather content.

A CaaS system is set to be the future for weather forecasting services across the board. The StormGeo CaaS service (built together with Singular.Live) makes advanced

use of graphics, such as interactive overlays, available for audiences across many channels.

As a category, subscription services are already extremely popular for well-known channels such as YouTube and social media. StormGeo Studio will expand the model into weather forecasting, causing a leap forward in the way that the weather story is told, with graphics, overlays and images providing the best possible viewer experience.

Reliability in Ever-Changing Times

With the difficulties experienced in broadcasting during 2020, and continued uncertainty around Covid-19, not to mention the looming climate crisis, broadcasters need a solution to safeguard service provision, whatever the future holds. StormGeo Studio's introduction of a robust and flexible system could not be timelier.

StormGeo Studio ensures straightforward, reliable performance for studio and outdoor broadcasts, supporting and easing production for operations and weather talents, and offering interest for viewers, even during unprecedented events.

And as consumer expectations continue to grow, the viewing experience can be enhanced to add tailored overlays and real-time interactivity.

StormGeo Studio is the ultimate service for the weather forecasting of the future. It replaces an outdated, unwieldy, and expensive operation with a future-proof, flexible, cost-effective service that offers reliability and an exciting user experience.

You can try StormGeo for free:
www.stormgeo.com/products/studio/campaigns/weather-in-a-box/



TAG Video Systems: A Zero Friction Approach to Adaptive Monitoring and Optimizing Assets

Maximizing OTT monitoring and how the cloud fits in

Consumers do not care how content gets delivered to them. They want to watch what they want, where they want. But they do expect a certain level of quality and performance and will quickly move on to the next provider if this is not delivered.

Satellite, cable, and telco operators are increasingly using OTT delivery to supplement and even replace traditional media delivery methods to engage and maintain viewers. But to maintain a high quality of experience for their customers, operators need a way to monitor hundreds – sometimes thousands – of channels and signal points without compromising real-time error detection. In most cases, the immense scale of their service offerings makes continual visual monitoring of all streams impossible.

The move to OTT requires service providers to deploy a much more dynamic infrastructure, one that can scale on demand as viewing surges during peak times, one that enables the launch of event-specific and time limited channels, one that enables infrastructure to be built on the fly. The business advantages are great and multi-faceted but taking full advantage demands a comprehensive, agile and operationally sophisticated monitoring solution to match.

No one builds out an IP based facility or transforms their production and distribution base to operate in the cloud without banking on the economic benefits that ensue. But there's no sense trying to capitalize on these opportunities if the best-case technologies are not leveraged and proper business models don't follow suit.

The emergence of the cloud into the media production and delivery space has pushed the broadcast and media industry toward an entirely new approach to acquiring and deploying technology. Large capital expenditures (CapEx) are increasingly being replaced by operating expense (OpEx) budgets that are more flexible and aligned with the operational requirements of today's broadcast facilities.

And in addition to the migration to cloud, another revolution is taking place in parallel – the adoption of flexible and floating software licenses and the business models that finally allow broadcasters to maximize asset utilization.

60-70% of the time an asset sits in a rack unused. The same is also true for cumbersome and convoluted licensing practices that require specific licenses for each feature. For example, a customer may have to purchase UHD licenses that only get used for an occasional project. It's an extremely expensive and highly inefficient model, especially when there is an alternative at hand.

Adaptive Monitoring

Enter Adaptive Monitoring – a mechanism that allocates resources where they are needed, reducing the level of monitoring and analysis, and providing content owners with the freedom to scale. In conventional monitoring deployments, the cost of licenses and compute power for full-time monitoring would place a ceiling on the number of points that could be monitored. But with Adaptive Monitoring, operators can mix and match different monitoring modes and have the agility to balance CPU resources against their need to monitor streams in real time. With the freedom to implement different monitoring modes within a single deployment, operators can take advantage of automated and adaptive resource allocation to get the most value from their available server resources. The result is a system that matches the cost of monitoring to the value of the content at that particular node in the delivery system, minimizing costs while maximizing the breadth and depth of monitoring.

Adaptive Monitoring allows monitoring in any of three operating modes – full monitoring, light monitoring, and extra-light monitoring – on a per-input-source basis. Using thresholds set by the operator within the software or triggered by an API connecting the system to external devices monitoring the overall ecosystem, the system automatically adapts to ensure optimal monitoring of all streams at all times.

While Adaptive Monitoring is invaluable in optimizing monitoring using on-premises hardware, it yields even greater benefits for cloud-based operations. The ability to dynamically change utilization of instances based on need at any given time can dramatically reduce the operational costs of cloud processing. Moving away from physical hardware, operators no longer need to scale their equipment and infrastructure to support maximum channel capacity – or leave hardware unused during non-peak times. The combination of Adaptive Monitoring and cloud-based processing resources allows operators to move toward a more economical pay-per-use model in which they can scale instances to match their need.

Whether processing takes place on-premises or in the cloud, Adaptive Monitoring ensures that if the system detects a problem on a channel, that channel is automatically switched to full monitoring mode. The dynamic nature of this model makes this an ideal solution for the many operators that need efficient high-density probing and monitoring of OTT channels without compromise.

A Zero Friction Approach

Imagine an OpEx model where the broadcaster only pays for the time its products are in use. As a production facility in London comes offline, for example, its product licences can be switched off or reassigned to its OTT or playout division anywhere around the world without incurring any penalty for doing so. This ability to move quickly from application to application can be described as ‘zero-friction’. A zero-friction business model allows for product deployment wherever and whenever it is required, in turn rocketing asset utilisation up to 80 and 90 per cent.

Thanks to the processing speed and data throughput of COTS hardware customers now have the technology they need to manage media across their entire organization. Software running on a common platform provides a whole host of functionality to further improve resource utilization.

Building on this, flexible software licenses are now ready to enable or disable functionality within a single software distribution. These licenses further improve flexibility as they can be purchased on a pay-as-you-go basis. Broadcasters want the freedom to allocate their licenses not only where and when, but for whatever product, feature and function they desire, maximizing flexibility.

Performing automated analysis of video and data on thousands of signals while keeping costs down is made possible with sophisticated Adaptive Monitoring and optimized with the agility of a zero-friction business model.

www.tagvs.com



Three Media: Process mining: a powerful tool for media architects

Debra Slater, *Managing Director, Three Media*

Media businesses have grown very complex in recent times. Where once it was a simple linear process of 'get programme in, check it, play it out to air', now it is considerably more challenging. There is much more content, going to many more outlets, each with their own set of commercial and technical rules.

For the vast majority of broadcasters and media companies, the workflows to do all of this have evolved. In truth, bits have been added as they have become necessary, with the result that often there is no coherent overall design.

That means that it is difficult to be absolutely sure that you are doing things in the most efficient way. Do you have too many resources – equipment lying idle, or staff sitting round waiting for something to happen – or do you have serious bottlenecks? What is the true cost of delivering a service, and what revenue is it earning? Where is further investment needed, and will it make a return?

Wikipedia defines process mining as "a family of techniques... to support the analysis of operational processes, with the goal to turn event data into insights and actions". It is a well-established technique in the IT industry. At Three Media, we recognised its potential in our industry, as a way of analysing the workflows that have grown up, to determine how best to optimise them. There are three defined stages of process mining: process discovery; conformance checking and performance analysis. We have developed a simple set of tools to approach these, implemented within the existing XEN:Pipeline, content broadcast management platform.

In our terms, process discovery means setting out the status quo. What steps do you need to get a piece of content through your system? What hardware does it pass through, and what operator steps are required? A new piece of content might be transcoded to the house standard, quality checked (automatic or manual), metadata enhanced (again, automatic and manual), stored, archived and backed up, collected for delivery, metadata transferred to playlists and online discovery engines, and transcoded for each platform.

Simple graphical tools with drag and drop help you model this on screen. You can mine each point in the process: how much operator time is allocated for a task; what processor resources are allocated for transcoding or transfer; and so on. A simple block diagram on screen will cover analysis of potentially thousands if not millions of data points.

Step two is conformance checking. This uses real data from all the devices and people which have been modelled, to compare the event log with the design goal. In our implementation, you can click on any point in the workflow to see that module's performance and use a wide range of dashboard tools to give a comprehensive view of overall performance.

The conformance checking exists to show where there are problems. You may have a business operational goal of moving content through a workflow or process within a target time, for instance, and the dashboard tells you that only 72% of content hits that target. That is the point at which you need to mine down into the data to see where the bottlenecks are occurring.

Conversely, if the dashboard says you are hitting the target 99% of the time, but you are not making a profit, process mining will identify where you are over-resourced.

Armed with all this information, you move to performance analysis. The simulation model allows you to change any parameters to understand how it impacts the overall workflow, and to look at performance over any period of time. It calls for a lot of processing, but our optimised software can analyse a three month window for a typical content processing workflow in around two minutes.



That is because we have consciously chosen to make performance analysis the powerful tool that is the real value of the process. Users can adjust any parameter from staff rotas to cloud SLAs. Artificial intelligence and machine learning built into the software drives reasoned decision-making.

The power of modelling comes in performing “what ifs” across multiple workflows, processes and teams. Metrics show throughput by client, supplier, file type, process, user and more, to help you and the AI optimise the system.

If performance is set against cost, you can see at a glance where investment in a pinch point will unlock the workflow; where you currently have resources that could be released. Analysing by file type, for instance, might show that a particular format costs significantly more to ingest than normal, in which case the conclusion might be to prevent suppliers using that format for delivery to you, unless as an exception.

Analysing across not just individual workflows but the wider enterprise supports business decisions. Modelling an SLA might show that you can actually offer your clients a better service within existing resources, which in turn would increase revenue faster than costs. If there

is a need in the performance-to-cost map, you know precisely what you can offer a client while remaining profitable on the transaction.

The extension of this is that you could model a workflow which does not exist. If you are a service provider – a playout centre, for example – and you are bidding for a new contract, the model will show exactly what resources are required to meet the SLAs in the tender.

You can then propose a figure that you know, with a very high degree of confidence, will allow you to meet the client's expectations and deliver profits. If the potential client says that someone has bid significantly less, you have the model to demonstrate to them why you are sure what it will take to service the contract.

Process mining may be a relatively unknown term within the media industry. But there is no chance that the media creation and delivery chain is going to get simpler. To stay competitive, businesses have to know how to generate efficiencies, to increase throughput, to launch new services.

Backed with an in-depth understanding of the industry, and powerful AI processing, process mining will become a critical tool for your competitive edge.

Verimatrix: Revealing Weaknesses in Media Apps: DRM is Not Enough



Neal Michie
Verimatrix

A digital rights management (DRM) solution alone simply doesn't do the trick when it comes to premium playback apps. Cyberattacks are becoming increasingly advanced and although the DRM has delivered secure viewing experiences, the user's device still presents risks.

Apps are often thought of as an extension of the business thus leaving security for them on the back burner. In fact, more often than not developers and security officers have very different understandings of the word 'protection' and security mandates are not always understood.

Verimatrix performed an assessment of 14 popular Android media applications to better understand the state of streaming app security. The full results are published in the ebook, 'Media App Vulnerabilities Exposed,' But we wanted to share some of the highlights and insights about the story behind the results.

The results of Verimatrix's assessment show that only 7% of the tested streaming apps achieved baseline protection level. Why is security for media apps often overlooked?

It's easy to say 'naivety,' but I think that would be unfair to the very bright people working in security at media organizations. I think the reality is that mobile app security falls into a gap. Traditional risk/security teams are focused on back-end security, while mobile development teams often believe that their DRM solution is enough to protect the content – and it is. But content isn't the only asset that needs protecting in a streaming app, although it may be the most obvious.

The trouble is that with no outside factor pushing the media app owners to look at app security, it often gets missed until it is too late.

What is the biggest misconception that developers have about streaming app security?

The biggest misconception developers have about streaming app security is that DRM is enough. It's not. DRM is more secure if it can't be isolated from the rest of the app.

Any attack will start with reverse engineering (understand the app to be attacked). Reverse engineering is a lot easier

if you can quickly identify and isolate interesting parts of the software. An attacker can then focus on the code that is of interest and ignore the rest.

It's also important to realize that a lot of data and valuable intellectual property exists in these apps beyond the content stream. Streaming apps also house payment information, personal data, code language and company secrets. Protecting all of these assets is critical to safeguarding revenue and maintaining customer trust.

What kinds of new protections are content providers demanding when it comes to OTT video apps? What can app developers do to achieve compliance quickly?

Content owners are very keen that their content isn't pirated – understandably so, since they spend a lot of money creating it. Content producers have well-resourced security and risk teams that analyze their ecosystem in its entirety. They are trained to spot gaps and vulnerabilities, and they tighten their mandates when they see a risk.

So far, mandates typically come from individual studios rather than MovieLabs or other regulatory organizations; and content owners seem to view all platforms as equal risk.

These mandates typically take the form of 'Robustness Rules,' which are technical conditions that a licensee (e.g., app developer or service provider) must satisfy. Robustness Rules typically require implementations that make it difficult to crack layers of security within the system. This takes the shape of commercial obfuscation and environmental checks, two security methods that protect code, APIs, data, and other valuable assets within the app.

In a perfect world, it would be possible to reference an exact and unchanging set of requirements for different terms (e.g., release window, content quality level, network type, client device type, usage rules). Unfortunately, this isn't the case. Ambiguities and subtleties about security

technologies abound, and they change over time.

What we do know is that studios' release windows are shrinking, or in some cases completely removed, due to various market pressures and current events (such as COVID-19 and the shutdown of many theaters), while playback quality and bandwidth are increasing. This has led to a general tightening of security mandates. The earlier the release, the more valuable the content and the more stringent the security requirements.

Will the new security mandates required by studios be enough of a push to protect streaming apps?

I'm an optimist, so, yes, I do. We've seen in other industries that when security standards are well defined and there is a consistent requirement to follow them, then they get near universal adoption.

This has proven good for these industries. Everyone's responsibilities are clearly defined, there is a level playing field for all participants, and one poor implementation doesn't damage the industry's reputation for everyone.

Are app developers aware of these mandates and the tools available to them?

Short answer: no. And if developers are aware of the mandates and the tools available, it is only a superficial awareness. In fact, if you ask many developers whether they protect their apps, their understanding of what constitutes 'protection' is much different than that of a security officer, CTO, or CISO.

When a security professional asks whether an app is protected, what they really want to know is whether an app is safe from reverse-engineering. When an app developer says that an application is protected, they often mean that they have employed the free tools that come with Android Studio. However, these tools are described in the Android community as 'optimizers' rather than 'protectors.' What's more, these tools do little to prevent a hacker attempting to reverse-engineer app code – they merely present a small hurdle.

What's the most surprising finding from the security assessment of popular streaming apps?

What surprised me most was that many apps aren't even employing the free tools (such as Proguard and R8) that come with the development kits. The usage rate for these free security tools was below mobile development norms! While the protection offered is minimal, it is better than nothing; and given that the cost to enable these tools is

zero, it seems negligent not to turn them on. The time and effort it takes to configure these tools is negligible – typically this task would take about half a day for most apps – so there is really no excuse to not use them.

How did Verimatrix and UL develop the grading scale used in the security assessment?

It is often difficult to quantify cybersecurity since it is a complex issue consisting of many layers, factors, and possible attack vectors. To help businesses assess their security measures, Verimatrix initially developed the app security grading scale as part of an investigation into the state of mobile banking security (you can view the eBook [here](#)).

During our research, we found that the best standards for app security were the ones put forth by Visa and Mastercard for mobile payment security. Their standards are high, yet practical and well-defined, which means that the implementor isn't required to dedicate excessive time and resources to unpacking each regulation. We used their standards as an example of good practice, which roughly equates to a B grade on the Verimatrix /UL scale.

For the complete assessment findings and tactical solutions to ensure security in premium playback apps download the eBook: 'Media App Vulnerabilities Exposed.' As media apps become increasingly popular and cyberattacks become more sophisticated, it is imperative to assess app security.



Vizrt:

NDI 5: Making Shared, Multi-Stream Video Productions Possible, Easy and Free for Everyone



Roberto Musso
*NDI® Senior
Product Manager,
Vizrt Group*

NDI (Network Device Interface) from Vizrt Group is the world's most widely adopted, software-defined IP video standard. The free-to-download platform allows everyone to easily share high-quality, low-latency video with anyone – live and in real-time – using billions of available internet-connected devices. At its core, NDI 5 moves video, audio, and data across any global, wireless, mobile or local network; between cameras; mobile devices; computers; and other production equipment.

The NDI platform has evolved for years since its initial launch in 2016, and the 2021 launch of NDI 5 provides users with a more straightforward, efficient, and flexible workflow with many key developments. Briefly stated, NDI 5 gives control to the users who can now specify which network interface will be used, reducing the potential for network resource conflicts with other protocols or applications. With NDI 5, it's easier and faster than ever to set up private NDI networks to ensure NDI streams or inputs can only be viewed by your selected production team. NDI 5 also supercharges post-production workflows and makes collaboration between sites easy and secure.

NDI 5 is used worldwide to add connected devices to networks at television stations, webcasting facilities, houses of worship, schools and universities, offices, or even out on the street from simple discovery. From school classrooms to network broadcasting, NDI supports the software and hardware in use today from a wide variety of NDI partners.

Why NDI?

Unlike other systems, NDI makes video a standard part of every computer network, from common IT implementations to mobile environments. This gives everyone access to easy-to-use, high-quality content creation capabilities with the equipment they already have. NDI 5 elevates video storytelling for broadcasters and producers of all sizes by turning the whole world into a studio.



NDI 5 breaks the limits of the local area network so that production content contribution can come from virtually anywhere. Remote video production effectively becomes local cloud-based studio production. This is because NDI 5 is about more than bringing in a few guests, like one might do on Zoom or Microsoft Teams, but instead it's about bringing in all the assets from one area and transporting them directly into a live or recorded production.

Keep in mind that NDI is free to download and use. While some solutions – such as hardware with NDI built-in or specific software and applications – may come at a cost, the ability to access NDI is absolutely free. Users can access NDI and its features immediately using tools they may already own such as a smartphone or tablet.

Challenging the Status Quo

NDI 5 offers an array of all-new features that break down the boundaries of AV-over-IP technology. Billions of devices are now NDI-enabled through ARM support. With a new Reliable UDP transmission protocol and a new network interface management, it's easy to set up a private NDI network. In addition, NDI 5 now offers significant Adobe Creative Cloud plugin improvements, an all-new Final Cut Pro plugin, and a new NDI Tools quick launcher with step-by-step setup guides.

A huge game-changing benefit of NDI is its ability to empower creative teams of any size to achieve big show results as there are no limitations from specialized upgrades, networks, or hardware. NDI enables multiple video sources to work simultaneously on Gigabit Ethernet networks and grows to 10Gbit and beyond for massive scaling to almost unlimited streams and resolutions. NDI can even use Wi-Fi networks as another complementary path to utilize smartphones, tablets, and other compatible products as content sources.

Why Now?

NDI 5 and the latest NDI Tools are particularly relevant today because NDI lives where people work – in their existing workflows and creative environments even if they are remote. The new Adobe Creative Cloud plugin from NDI 5, for example, allows audio output both to the soundcard and the NDI output, meaning users can hear the very same audio as is going out to NDI, providing a full editor workflow for Adobe Video Production. The system's new Final Cut Pro plugin enables NDI output from the timeline playout, with real-time audio and video frame buffer output – making working and collaborating with Final Cut Pro easier than ever.

And of course, NDI is more than just a means of transport. It allows for control of devices like PTZ cameras, capturing video feeds directly from the network to use in editing, and defines a standard for encoding and decoding. While all NDI is compressed, there is also a high-efficiency option that includes an uncomplicated way for devices to find each other on a network.

In addition to near universal acceptance with broadcast studio productions, NDI's capabilities have also spread to the pro installation space. A substantial number of

houses of worship, schools, live sporting, and music venues, and enterprises have added NDI feeds to their workflows to improve communication. NDI is widely used in live productions where switching is done in real-time to save on post-production efforts.

These live production systems were once found only in the realm of broadcast but are now more readily affordable by small-to-medium-sized businesses and individual content creators. For example, a few PTZ cameras can be positioned in a remote area connected to the network while the live production system can be in a completely different location – eliminating the need for two large production sites to be created.

What the future of NDI holds

NDI 5 is designed to harness the massive creative potential of software and networks, allowing anyone, anywhere to work with video. Because NDI is free-to-use and extremely flexible and scalable, we will continue to see its uses grow rapidly and become even more diverse.

This flexible, scalable environment is excellent for video interviews, videogame streaming, tabletop roleplaying and board game streaming, on-site musical or stage performances, the possibilities are limitless. People have gotten extremely creative with these tools – everything from cooking shows to exercise classes are being produced with NDI.

While there are many other specific use cases, it would be impossible to list them all. The reality is that NDI enables more video capabilities to exist. For in-studio, remote or live events, NDI provides an elegant solution that merges the many elements of a production to accomplish any creative vision. With unrivaled ease of use, efficiency, and cost-effectiveness, NDI means almost any space – work, schools, churches, homes, venues, or even sports fields – can become a location for live video, and this is a very liberating industry development, both for creativity and for business.

[Watch our video on NDI 5 here.](#)

Artificial Intelligence

Artificial Intelligence



AI in News

“the best Assistant Producer you ever had”



Sandy Macintyre
VP News,
Associated Press

How the Associated Press applied AI to deliver automatic descriptions of live and non-live content



Maarten Verwaest
CEO, Limecraft

In 2019, the Associated Press (AP) – the world’s largest international news agency – instigated a project to leverage AI technology to shorten its production process so that its customers could receive content more quickly, while significantly reducing manual input, freeing its own staff for more creative purposes. AP turned to Limecraft to enable the transformation, using Vidrovr for scene description, facial recognition and gesture detection alongside Trint for audio description, which together deliver a single, coherent and frame-accurate description of every individual shot.

At a recent BaM live!™ event, Sandy Macintyre, VP News at Associated Press, and Maarten Verwaest, CEO of Limecraft, gave a wide-ranging and honest description of the unfolding of the project. Far from being a ‘fit and forget’ job, it proved to be a complex but ultimately very worthwhile project. What follows is an edited transcript of the session, providing a brilliant insight for everyone who is considering embarking on tapping up AI technology to enhance their processes: in short, the more you put in, the more you get out.

What drove Associated Press to investigate the role AI could play in its production process?

Sandy: “Our starting point was: can AI help us reduce the amount of time that we’re spending on the very manual tasks, which of themselves are important, but are not part of the creative storytelling journalistic process? What we were trying to do achieve was to remove what we might call the ‘grunt work’ from a workflow – the really manual stuff. That took us towards AI because one of the things that all news companies in the broadcast space spend an inordinate amount of time doing is transcription of interviews and shot lists in terms of depicting frame-by-frame what is filmed and

what’s going into an edit. If AI could help us with this, we thought we could save literally tens of thousands of hours of manual time.

“To put this into context, as the world’s largest, and indeed oldest international news agency, we transmit to hundreds of broadcasters and digital publishers around the world; it all adds up to about 20,000 hours of live content or 100-150,000 edited items every year. That’s literally hundreds of thousands of minutes of content that have to be manually transcribed and shot listed so the scale is vast, and therefore the time saving could be huge. But where we were also coming at this from was, if we can solve a problem for ourselves, we can also solve a problem for everybody who is a subscriber or customer of AP, which is around 700 broadcasters and probably twice that number of digital publishers; they get their content more quickly.”

What can you do with the ‘grunt’ time you’ve liberated?

Sandy: “If you go back to the days of film, you had a couple of hours between the time you shot something and the time something aired; when we got to tape, yes there was the editing process, but it was then running away someplace across town to the feed point to feed the video. This is just another big, polar change of how you spend that time. But crucially at this time in the era of fake news, fact checking – getting it right – has never been more important. So if you think about most news organizations that are about both being first with the news and about being right and accurate, winning this time by using AI allows for speed and accuracy to come to the fore – and of course, more creativity in the editing process.”

Quality and accuracy are paramount

Maarten: “The quality of the output of artificial intelligence is a critical success factor for acceptance. If the word error rate is four or five percent, that’s not acceptable – the rate needs to be pushed below 2% and that’s a challenge from an engineering point of view. We excel at pushing technology to a level where it becomes enjoyable for journalists to use. And what we found is that there is a huge gap between what a typical engineer seems to find acceptable and what the journalist will accept. There is nothing more frustrating than having to correct artificial intelligence again and again because it’s been recognizing the wrong person, or the wrong word. And that’s where technology has evolved a lot the last 24 months; I would say that’s where massive training comes in. People looking to engage with artificial intelligence should look for a proper man in the middle interface – a proofreading interface: you have to accept that artificial intelligence will make mistakes from time to time, and that it needs correction, and quality control, and that needs to go as smoothly as possible. With these three conditions: a good engine, proper training and a good user interface, you increase your chances of an acceptable solution.”

What process did you adopt to roll out the AI?

Sandy: “I think we’ve got to be very honest and say that at the start of this process – at the start of all new technology processes – there is an element of fear: fear that people might lose their jobs, fear of change, fear that ‘I won’t get the new ways’. So what we had to do was be very open and honest with people about what we were trying to achieve, which was to liberate quality time back to the folks who had to do this work. But we also had to recognize that because real time video is now such a big and growing part of the news ecosystem, that wasn’t going away. And therefore, liberating that time was doubly important, because the volume has gone up. The terms of success on which we are judged are live real time, and therefore we had to

make these changes. So we effectively put together a coalition of the willing. And within that, we deliberately also asked people who were potential naysayers and doubters to come to the table because their input was super-important. And we knew that over time, they would probably become some of our biggest and most evangelical supporters, if we could get this right.

“But crucially as well, it had to be people who were actually doing this work, so that they could know the difference between how it was before, and how it will be. And also, so we could get to the tipping point between when it is faster to do it all manually, versus when AI wins the race – and also recognizing the point where, while AI still makes some mistakes, it’s actually quicker to catch and correct those mistakes. So what you have ended up with is a shift to where I describe AI as the best Assistant Producer – the best intern you ever had – right now. But in time with the training, we’re constantly giving knowledge back to it, creating that learning loop, so that Assistant Producer goes up through the ranks and potentially becomes the Executive Producer of this whole workflow process. That’s very much the journey that we’re on.”

All-in or phased process?

Sandy: “The first thing we quite quickly realized was that a ‘boil the ocean’ approach of throwing all our content into the AI bot and trying to get AI to recognize it just wasn’t sustainable; the technology is not that smart yet. We quickly realized that a huge amount of content that appears on television screens across digital publishers every day is what you might call governmental, political, diplomatic content – Joe Biden getting off a plane, getting in a car, getting on a stage, making a speech, having a bilateral meeting etc. All of these things you could also apply to any world leader, foreign minister or celebrity. So we knew that if we could teach it recognize these kinds of actions, we could take possibly 20 to 25% of the news content that flows through the AP system every day, and gain understanding of that – and that indeed is

what we've done. We've been able to teach it say the top 300 names that appear most frequently on the screen in the world, and the actions that those people might take within a range of known domains.

"The second is that we absolutely did this offline – we got into the digital sandpit and we played there, so that it wasn't polluting the everyday workflows that continued. It's been a fast, iterative process which hasn't got too hung up early on about how it integrates with legacy systems. We got something that works in a beta phase in the sandpit, and then figured out how we would integrate it into the technical and editorial workflows – and let the people who've done that work in the sandpit be the ones who are leading the conversation about integration.

"This process also allows us to take a very hard line – drive it or park it. Is this going to work, how big a help is it going to be, is it worth persisting with? We thought we would get this done inside a year; perhaps more accurately, I naively thought we would get this done inside a year. And the truth is it's probably taken us two and it will take us another one to get the amount of learnings in there for us to really drive change. It goes back to that analogy of this being as clever, sophisticated and experienced as your assistant producer. But when you create that learning loop of knowledge and experience in the real world, in 12 months' time with the amount that will go through that learning loop, that machine will be way more experienced, way more helpful – way more like a senior member of the editorial team."

What have been the catalysts to propelling AI into the demonstrably useful tool AP has now?

Maarten: "We've seen plenty of technologies like speech recognition, facial recognition maturing as standalone singular point solutions over recent years, and there are many AI companies out there. But users like news desks have realized that there was a serious effort required to integrate these point technologies into workable solution. What's changed? From 2018 to 2020, Limecraft has been involved in **Memad**, a €3.5m R&D effort funded by the European

Commission. That's enabled us to combine all the different aspects – speech recognition, scene detection, gesture detection, face detection, optical character recognition, emotional tonality detection – into a single, coherent and phrase-accurate description as if it were produced by a journalist. And it's made it searchable, effectively automating the shot-listing process in a quantum leap from technology into solution that can be adopted by real-world users."

Where will AI take AP in the coming years?

Sandy: "We need to figure out how or if AI can help us with the tonality and the accidental bias of any content. AP prides itself on fair, accurate, impartial news, and therefore we need to ensure that our reporting both reflects fairness and the world we live in. I think there will definitely be an AI component to understanding whether you get the tone right, are you biased in favour of one side or the other or one gender or the other, one ethnic group or the other. I think you can get an awful lot of information back from AI in this regard, and there is a project already underway which we are associated with, under the IBC Accelerator umbrella. It is beginning to take baby steps into doing this – and Hollywood and the movie industry is already running scripts through just this kind of tonality index; look out for this at IBC."

Future direction of AI

Maarten: "Artificial intelligence is only as intelligent as it has been trained to be and training with accurate, normalized data is a critical success factor, as well as a scalability inhibitor if not done correctly. What we've done with AP is set up the feedback loop from a journalist into the 'brain', continuously updating the data model going forward. We hope this corpus of data will be exposed to third parties, and in the future, it's my hope that other customers like local news desks will also provide feedback to the overall data model. So we have this joint co-creation effort, and my hope is that AI evolves in that direction."

You can watch the original video of this session at BaM Live!™ [here](#).

Salsa Sound – AI for audio: where automated production delivers benefits



Rob Oldfield
*Co-Founder and CEO,
Salsa Sound*

Live sport is one of the most watched content genres and in an era where on-demand and non-linear viewing is edging out linear, it continues to buck the trend. Fans at home want a live experience that is better than being at the stadium, with multiple camera angles and immersive sound. Clubs and sports leagues also want their content to reach as many fans around the globe as possible – online, on linear and on social media.

What this means for broadcasters is creating flawless audio and video, making multiple language versions available and delivering live content as it happens to social media. The challenge facing the industry as a whole is that budgets and staffing numbers are not changing; everyone is trying to do more for less.

The job of a sound engineer is becoming harder rather than easier as new technologies and formats come to the fore, involving more time-intensive, manual processes. The average production can already involve creating over 16 mixes; anything more puts stress on an already stretched workflow – or requires an increased workforce.

Fans' expectations are not getting any lower either – quite the opposite, in fact. So, how do broadcasters continue to meet fans' expectations for live content experiences that continually push the envelope forward?

Getting immersive with AI

Enter AI. The technology enables sound engineers to automatically create bespoke, enhanced and 360 immersive audio experiences, with multiple simultaneous mixes that give fans the ultimate listening experience whatever their device or preferences.

By automating the manual-heavy processes, AI-based solutions free up sound engineers to focus on becoming creatives; they can craft rather than chase a mix. This means a far richer audio experience for the end viewer.

Bringing the type of intelligent automation into the workflow that AI makes possible, gives broadcasters a cost-effective way to meet the growing demand for coverage of even the most niche sports, and still deliver the high-end results that align with their brand.

In a traditional live production environment, audio is a job on its own, requiring a level of experience and expertise that is outside that of other members of the production team. When it comes to niche productions, everything – including cost – has to be pared right down. Here, leveraging automated mixes that can be set up ahead of time, means a small production crew – with one person handling audio, video, and graphics – can take care of the job. It is all about making the job easier and giving broadcasters a way to meet the demand for niche content (e.g., reserve or development team matches), that audiences are showing a growing appetite for.



AI can automatically render to multiple formats and mix multiple language versions and even create different crowd flavours (for home and away matches for example). Intelligent automation means each mix is made compliant to meet the loudness standards and parameters required by social media platforms, linear broadcast, VOD, or OTT.



Working with what you have

Doing more for less – without adding complexity – is top priority for any broadcaster today. What sets Salsa Sound apart is that we have developed our AI technology to integrate with and make use of existing infrastructure. We deliver all the automation capability and the ability to create stunning, immersive sound using a standard microphone set-up.

By taking audio feeds from existing broadcast microphones at a stadium, we can use AI algorithms that automatically detect, mix in and enhance the on-pitch/court/ring sounds. As a result, the sound engineer can create engaging real-time mixes without the need for additional kit requirements.

The beauty of this approach is that you do not have to be a topflight club or Tier 1 broadcaster to give viewers amazing, immersive sound. By making use of what is already in place, we are opening up the power of AI to smaller clubs, niche sports and even applications outside premium live sports broadcasting.

By adding automation to the workflow in an intelligent way that actually adds value, we can open up a world of possibility.

A new world of sound

Making effective use of AI is all about leveraging the data; if we can start to see microphones as data capture devices rather than just sound recorders, it opens up the possibility of mining that vast amount of data for sounds that give more meaning to video.

One key area where this approach comes into its own is in highlights creation. AI technology can be trained, for example, to automatically select clips based on what is happening in the audio feed and entering it as part of the metadata; picking up sections where the referee/umpire has been active or vocal, have changes in crowd noise.

Commentary is another area where you can use machine learning to generate speech to text and in turn create powerful metadata describing the content. This can help content, tagging, searching or segmenting and provide a better service for content creators and viewers.

While sports, football in particular, is a natural starting point for AI-based audio mixing, this is by no means where the possibilities end. Audio recognition is relevant to everything from game shows to other live entertainment genres.

We are still just scratching the surface of what AI can do to take audio in live production to a whole new level.



EMS celebrates 25 years exhibiting at IBC

IBC is always a great event for professionals in the media and broadcasting industry, but this year is extra meaningful for recruitment specialists, **EMS Broadcast**, as it marks their 25th year exhibiting.

Now, its Founder and Managing Director, Dermot Casey, reflects on how far the company has come and its ambitious plans for the future.



Brief history:

EMS was formed in 1993 by four ITN Broadcast project engineers. We soon established ourselves as one of the leading Broadcast Systems Integration Companies in the UK. In 1995, we first exhibited at IBC and have continued to do so each year since.

Our clients at the time were asking us if team members could stay on after our Systems Integration work had ended to help them through a transition period and we then started to provide specialist broadcast staff to the industry, so in 1998 we started EMS Technical Personnel Ltd. This became more and more successful over the years until we decided to focus 100% on the specialist recruitment business in 2008.

Progression through the years:

EMS Personnel quickly established a reputation for providing quality broadcast technical staff to all the main broadcasters. Our clients soon understood our in-depth knowledge of the industry and trusted us to source the right candidates for them – not only from an experience and background perspective, but also

our ability to assess the candidate's personality and whether both sides would work well together. Alan Hatvany, who has been with EMS for over a decade, now runs this side of the business and has built up a strong portfolio of highly skilled candidates and a broad base of cutting-edge clients.

In 2018, we decided to expand to also offer Operational, Post-Production and Creative staff to the industry. This is led by Adrian Thomas, former Director of Broadcast Schedules Operations at Discovery and previously Broadcast Presentation Manager at ITV.

Since then, we have been successfully forging a parallel path in new areas – sourcing and supplying more Operational, Post-Production and Creative talent and working with a number of different media partners to do this, with roles spanning from Digital Video Editors and VOD Specialists, to Producers, Schedulers and Anchor News Presenters.

When speaking about this new strategic direction, Adrian Thomas said: "It was great to bring a new focus to EMS and now we're starting



to reap the rewards with a more diverse portfolio of clients and candidates than ever before.

"The recruitment business is changing with new demands and more hybrid roles and this opening up of new markets comes with challenges, but the signs are positive, and the broader approach allows us to talk and support clients across a huge range of skills and positions."

Today and in the future:

EMS now has plans for a major expansion to cope with the expected upturn in business. This includes projects that were put on hold over the past two years plus the exciting news of huge investment in new Hollywood style film and production facilities that are being planned throughout the UK to produce the much needed 'New Content' that everyone is waiting for.

We are also launching a new website, have a new stand layout at IBC, and are planning an expanded team along with an exciting campaign to promote the new areas that we've moved into. So exciting times all-round, and all that starts at IBC 2021.

Please visit our stand in Hall 1-B09.

For more information about EMS Broadcast, and how our specialists can work with you, please visit:
www.emsbroadcast.com

About EMS:

EMS Broadcast is a leading specialist recruitment agency for the technical, operational and creative areas of the media and broadcast industry – but it's also so much more. Each of its recruitment specialists held a career in the media, broadcasting and production industry before moving into recruitment, so know the processes and the skillsets that are needed to take any operation to the next level.

Working with the most progressive broadcasting companies of all sizes to help them find the best talent for their departments and working with candidates to help them build exciting careers, EMS also prides itself on providing a completely end-to-end recruitment journey – taking care of everything from sourcing and interview preparation to compliance and payroll.

The company is headquartered in West London but works with clients and candidates across all areas of the UK as well as Europe, Scandinavia and the Middle East.

Case Study: ATP Media & Object Matrix

ATP Media is the global sales, broadcast production & distribution arm of the ATP Tour, the global governing body of men's professional tennis. Formed in 1999, ATP Media provides the centralised exploitation and host broadcast production for the worldwide television and digital broadcast rights of 64 global tournaments.

ATP Media has unrivalled access and expertise in the broadcast production of men's professional tennis. This unique service incorporates rights sales, multi-platform production, content management and worldwide delivery into a comprehensive end-to-end broadcast-focused solution. Tennis TV is ATP Media's direct-to consumer, OTT streaming service, delivering both live and on demand content to all major streaming devices. It also features over 10,000 hours of full matches dating back to 1990.

The Customer Challenge

ATP Media already has a B2B commercial archive site in the cloud that hosts the ATP Tour Masters 1000 and Nitto ATP Finals match content for commercial exploitation. There was however, a wider asset management challenge – the aim to migrate and preserve all other match and video content across the Tour and present a globally accessible Production Asset Management service.

ATP Media initially approached Object Matrix with the requirement of preserving this high volume of media. ATP Media created a Preservation Project to enable the migration and long-term storage of existing heritage video content from legacy formats and infrastructure, such as LTO, to a secure location. As a by-product of this investment, ATP media was keen to consult with Object Matrix to also add the capability for the platform to serve as a media Production Asset Management system (PAM).

This would enable the Production and Digital teams to manage their edit archive effectively, and to link ATP Media's content delivery network to thousands of hours of footage.

As a globally moving property, ATP Media had previously been tied to drives that it needed to physically move around between events. This caused an issue for PAM and brought its own set of challenges and risks, being

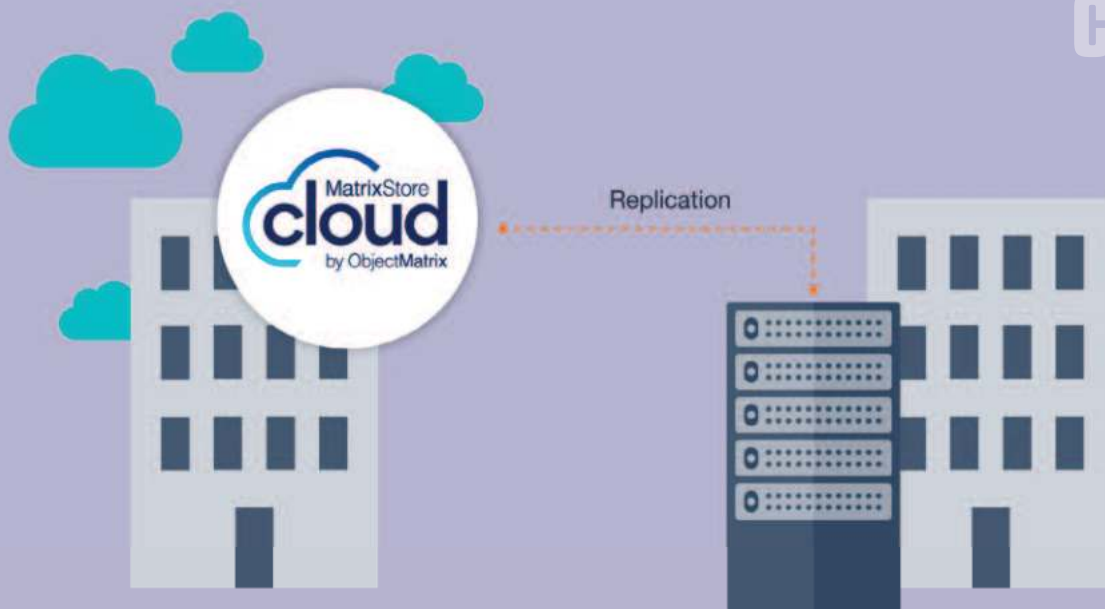
very cumbersome to manage and not always secure as the drives could get lost or damaged in transit between locations. Global production teams needed a scalable, flexible, and highly available digital environment to handle active media.

Functionality was key but scope was also important, ATP Media was keen to ensure that the business could evolve over the long-term. The team required a solution that would be agile enough to integrate into relevant workflows and systems. As well as handle all work in progress, including all match content, synced live using global connective networks. Any solution also needed to take into account the evolution of the business, enabling the team to implement feature requests that might become important in the future.



Whilst the MatrixStore solution was an undoubted leader in scalable object based, media focused storage, we were keen to create a service that used that scale and flexibility in a production environment as an added benefit. The Object Matrix team quickly deployed important features such as Partial File Restore which meant our teams could quickly clip up and download short sections of match content that would otherwise be a challenge to download given the length and size of the media involved."

Shane Warden,
Chief Technology Officer,
ATP Media



The Solution and Workflow

ATP Media's initial investment was half a petabyte of storage as a managed service (MaaS) so Object Matrix deployed a private instance of MatrixStore Cloud within a data centre in London, alongside a replication cluster in a secondary data centre. Through this bespoke cluster, ATP Media was allocated internet connectivity, as well as a dedicated fibre connection to ensure both global access over internet and local file system access to the facility using the MatrixStore File System (MXFS).

Scalability and security were key requirements, along with the need to avoid the potential egress costs of a public cloud solution, given the high demand that would be placed on moving content in and out. Having the ability to share content with conditional access between teams and freelancers means that ATP Media is always in control of its content through auditing capabilities and access permissions.

MatrixStore's Vision interface brought the team additional operational benefits through ease of use, either by freelancers or internal production staff. ATP Media wanted a system that didn't require a lot of training and support, to locate and share content. Vision allows users to quickly integrate, and global connectivity offers the option to work with staff in any location or on the move.



If you view our business from a very simple high level, we make stuff, we move stuff and we store stuff – then we go round again, but the biggest financial challenge in Public Cloud is moving stuff as our content is rarely static for long."

Shane Warden

Chief Technology Officer, ATP Media

The Future

Investment in object-based storage provided the key to future flexibility for the team. Offering them the ability to present media for any environment and workflow, including Ai, ML services as well as both cloud and on-prem solutions.

ATP Media have already added another replicated half a Petabyte as the adoption of the system has been exponential given the challenges presented by the COVID pandemic and the need for even greater remote access of content.

About Object Matrix

Object Matrix is the award winning software company that pioneered object storage and the modernisation of media archives. It exists to enable global collaboration, increase operational efficiencies and empower creativity through deployment of MatrixStore, the on-prem and hybrid cloud storage platform. Their focus on the media industry gives them a deep understanding of the challenges organisations face when protecting, processing and sharing video content. Customers include: BBC, Orange, France Televisions, BT, HBO, TV Globo, MSG-N and NBC Universal.



MOG Technologies: Native-Cloud: The Endgame for Remote Production Workflows

In the past five years, media technology providers have developed innovative solutions to solve significant challenges that come with cloud-based video production.

There were advances in processing, editing, networking, storage, media transfer, and now, more recently, AI and automation that have enabled more video production workflows to move into the cloud.

More recently, and amplified by the current times, studios, rental houses, and enterprise production companies are turning to remote production activities, but still, the overall production and distribution workflows continue to present major challenges and inherent inefficiencies due to legacy media technology, workload management, and infrastructural costs.

It's no news that the industry is on the precipice of significant disruption to those legacy media workflows: they kind of have to. However, to empower creative talent and compete in a market that's producing content faster each day, studios must increase their ability to keep up with this demand.

Even before the past two years, cloud-based video production technology has enabled remote work for IT

efforts. On the postproduction side, reviewing daily footage, color grading, audio editing, and VFX are increasingly becoming the norm – just think of suppliers like Frame.io or Blackbird. However, there are several key issues that are preventing some types of production work from being done remotely, especially when you look into the whole media supply chain.

So, where are we now?

We are all aware of the advantages of cloud production; this topic has been covered a lot over time. However, today's demands have put strains on the legacy video workflows due to the need to support a higher volume of production and post-production resources – not only on the technology side but also talent. Current times have amplified the demand for

direct-to-consumer content – think of the OTT explosion – and also put additional strain on those same resources **to support remote access**.



Supporting this migration can result in a massive increase in costs. Large studios might have budgets and dedicated IT capable of working with newer technologies, but smaller creators – mid-sized studios or even in-house brand managers – simply can't access that same toolset.

Understanding Remote Production's Excessive Costs

The advantages of going remote are many. We can have our equipment safely in one place and we can serve lots of different filming without having to transport everything. Of course, it's not just the dedicated media machines that get transported somewhere else; we can also have our production team access the production from different locations, without compromising the workflow.

And whilst remote production is great, it's very expensive. Ask anyone in these last two years that decided to move to remote, and they'll tell you that the jump in costs is substantial. There are three main factors driving costs up when working with data centers and companies supplying remote solutions for video.

The first is dedicated equipment. In a remote workflow, dedicated hardware is placed in a specific data center. This means that:

- a)** if you want to work off of another datacentre that might be closer to you, bad luck, you can't; and
- b)** supplying and housing dedicated units in data centers is expensive.

The second factor driving up costs is the necessity for dedicated personnel to maintain, repair, and

interface with those machines. Whenever the production team wants to use them, they must contact whoever prepared the units to turn them on. So, let's say you have an issue with the units you are using. Now you need dedicated support to go to that specific data center, to that dedicated unit, to fix the issue.

And even though that's already a lot, there's still the **third reason** why costs are so prohibitive: **machine uptime.**

On a standard remote production infrastructure, the dedicated machines you are connecting to are not usually optimized for remote. If you want to film for, let's say, two weeks, you'd be paying for the two whole weeks where the machine is turned on. And you might think, fair enough, but the reality is that, during those two weeks, **there are a lot of downtimes.** The cameras are not rolling continuously to justify every hour of every day to match the cost. **That leaves a lot of time where you're just paying for nothing.**



Summing it up, the three big reasons why Remote Production workflows in use today are so expensive are:

1. Dedicated machines are not designed for remote production;
2. The continuous need for dedicated personnel on a specific data center is expensive;
3. Terrible uptime optimization, which often leaves you paying for nothing.

Native Cloud take Hold

To start, when we say native cloud, we mean that this is no longer a **dedicated hardware solution**, but a dedicated production software that can run on any hardware, on any data center.

Native cloud massively reduces the cost of resources, talent, and technology

Native Cloud is a virtualization technology that allows you to package and separate individual micro-services designed to be deployed on agnostic hardware, that fit multiple environments. Suddenly, we don't have to pay extra costs for bringing dedicated machines to data centers, because we're now running all the operations virtually, on the powerful units that the data center is already equipped with.

This means that no dedicated machines are needed. It also means that we don't need specific personnel on that data center: **all the operations are set up via your internet browser, with ease.**

And finally, in the case that anything happens to a specific unit, another one next to it can take its place. **Poor machine uptimes are no longer an issue**, as production instances can be launched only when needed, thus dramatically reducing media processing costs.

In a nutshell, native cloud infrastructures offer many benefits for media organizations. For example, the micro-services provide the flexibility to efficiently manage new remote workflows and infrastructures consistently across all applications, such as ingest, encoding, transcoding, streaming, and video transport.

Looking into the future: Container-based deployments

We already covered that the endgame here is native cloud. When compared to remote production infrastructures in use today, native cloud massively reduces the cost of resources, talent, and technology.

Those factors are what are prompting more and more media businesses to work with native-cloud providers, like MOG, to evolve their hybrid or public cloud resources and workflows.

The shift to native cloud technologies is also driving interest in container-based deployments. Platforms such as Kubernetes offer high-available

infrastructures that allow media companies to move their workflows to, or from any public, private or hybrid cloud, without having to completely change their entire infrastructure.

Containers will offer a consistent way to ensure high-level availability while removing the complexity associated with traditional approaches.

There's no doubt for us that containers will become the main deployment solution for the remote and hybrid world. Native cloud technologies are essential to empower media businesses with the right tools and make remote production financially accessible to all. And we sure want to be a part of that change.



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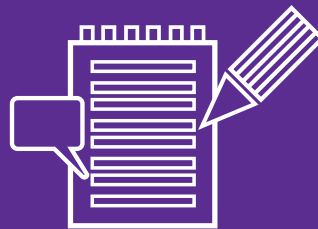
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Member Speak – ETL Systems



Dr Esen Bayar
CEO,
ETL Systems

Awarded with a PhD following his study at King's College, University of London, Dr Esen Bayar has over 30 years' experience in satellite communication systems and hardware design and development. Esen joined ETL via a management buy-in in June 2003. He is engaged in developing ETL's operational procedures and technologies, which have played a pivotal role in transforming ETL into a global leader in RF engineering.

Hi Esen, could you please tell us about ETL's history, growth and current operations?

ETL's heritage is in designing satellite signal routing solutions for broadcasters, who need extremely high levels of RF performance, as well as redundancy and resilience. Over time, our range has expanded to cover applications for government, defence, marine, and private VSAT networks, as well as global satellite operators.

Set up in 1984, ETL has a long and rich RF engineering history, but a key turning point for the business was in 2003, when my business partner and I acquired the company. Our vision was to make ETL a truly international company.

We introduced innovative, high-tech automated manufacturing, and elevated our product to the highest quality. We formed partnerships with our customers, which enabled us to understand the challenges they have and steer our growth along those lines. We also grew our engineering capabilities with significant investment in manufacturing, which has given us a great competitive advantage over the years, enabling us to get to market fast, retain greater control and allow innovation to flourish. We have also invested in

our people throughout, which has been integral to our growth.

Fast-forward to now and ETL has 155 employees and, as well as our headquarters in Herefordshire, we have an R&D centre just north of London and sales offices in Dubai and Washington DC.

Could you give us an outline of ETL's current range of products and services?

We design a broad range of RF equipment to serve the satellite communication sector, which is a multi-billion-dollar industry that continues to see year-on-year growth. Broadcasters rely on it, and us, to deliver high-quality content to billions of people around the world.

The beauty of satellite communication is that it doesn't matter where you are, we can get a signal to you – while also integrating seamlessly with the terrestrial network.

What broadcasters want and need to transport has of course evolved over the years; our equipment used to send and receive lots of audio and video content, whereas now the vast majority is data.

Regardless of what is being transported, the use of satellites by broadcasters continues to be an

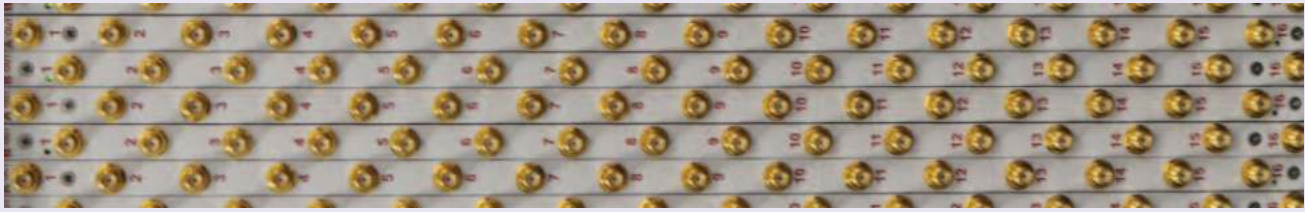
integral piece of the jigsaw, enabling the reliable high-quality glitch-free coverage of sports, news and events the consumer has come to expect.

ETL's main function is to develop and provide the necessary equipment and technology for transporting data from broadcast end-users to the satellite dishes, and then on to the satellites themselves. On the return, we pick up the data and transport it for the end user/operator.

In order to achieve this, the signal frequency needs to be increased and modulated – and with the satellite networks themselves becoming smarter and capable of greater throughput, technology in the ground segment has advanced and moved forward. Over time, our innovations are enabling us to help broadcasters to transport data via satellite networks at a lower cost without compromising on redundancy or performance.

What new products are we seeing coming to the market?

Research and development is central to our success and we often supersede our own products ourselves. We are always aiming to fulfil new requirements. I'm a strong believer in the power of teamwork



and having a multidisciplinary skill-set in-house. At ETL, we've brought together expertise in RF and electronics, mechanical & thermal design, software, RF over fibre and all aspects of high-tech product design & manufacturing.

A major milestone this year has been the development of a new high-density large matrix called Havoc, which enables routing for up to 256 x 256 input and output feeds – the world's first single chassis RF router of this capacity. These products are over a metre tall and can carry an amazing amount of data. This is the largest and most advanced device of its kind and enables the operator to cut down on modems and modulators and significantly reduce capital expenditure.

We have also launched a series of products called Genus, which is a completely new concept. We are not an "us too" company and this range demonstrates that. It is a flexible and intelligent habitat, great for combining lots of functional building blocks – power supplies, amplifiers, matrices, frequency converters, RF over fibre – in one unit. It's not the conventional way of thinking about things. We've redesigned and reengineered it from the ground up to enable much more flexibility.

For example, the power supply normally has a five-year lifespan, while an amplifier has 15 years. Before the power supply goes down, Genus would send a notification to the end-user to remind them to replace it. The aim with all of this is to future-proof the equipment, add flexibility, and all while continue to deliver the best performance and redundancy.

Are there any projects you are particularly proud of?

There are many, including the two I have already mentioned. I am tremendously proud of the high-density, high-tech H-series matrices we've developed, including Havoc. Also developing Genus, a completely novel technology, from scratch.

Aside from these, we also introduced a new set of products for RF over fibre applications about five years ago. These are now responsible for about a fifth of our total sales, which has been absolutely incredible growth.

More recently, we launched a range of frequency converters, a first for us coming up against a number of established competitors. In a short timeframe, many large global operators have already begun adopting our technology. We are serving both indoor and outdoor applications.

Why do your customers continue to choose you over your competitors?

I think I can distill this down to three basic points.

In no specific order, the first is the quality and performance of our products; the second is our passion and customer empathy; and the third is our partnership with customers from concept to delivery, from beginning to end.

These are the three fundamental points that ensure our customers are satisfied when they choose us.

What's next for ETL Systems?

Our product development is never ending. Our mission is always to come up with better, more

intelligent and highly reliable products.

Perhaps the most promising new technology we are working on, which we expect to realise and begin commercial manufacture of in 2022, is digital IF for the satellite ground segment. This new technology, which we are working on alongside the European Space Agency, will enable us to convert ground infrastructure transmissions from analogue to digital, with many very interesting benefits for end-users.

This is highly exciting, but equally challenging. We have been working on this since 2019, and at times we were left scratching our heads and had to go back to the drawing board. But we thrive on these challenges. We've got a winning formula now and I believe in time it will have tremendous applications and implications for broadcasters. Watch this space!

Find out more here:
<https://www.etlsystems.com/>



Levira's base of operation is the Tallinn TV tower, where we are servicing some 50 channels and distribute them to the broadcasters' desired markets and affiliates in Europe and beyond

Member Speak – **Levira**

Need for balance – how to match your TV channel business model with the playout technologies and services available? What about taking back the control?



Martti Kinkar
*Head of Development and
Innovation, Levira*

At the end of 2021, and for the foreseeable future, both national and international TV broadcasters face the challenges of how to find the balance between fast-changing external market forces, the business model chosen, and the technologies implemented to gain market success.

In the real world, there are always discrepancies between the fast-moving market environment, the business model available, creative needs, and the technologies & services available to balance it all. Levira has kept its eye on these changes and our customers' needs and has reached conclusions which informed our next steps.

Levira's base of operation is the Tallinn TV tower, where we are servicing some 50 channels and distribute them to the broadcasters' desired markets and affiliates in Europe and beyond. Alongside our other media businesses, play-out services and solutions are our focus. Levira's customer base is quite wide with many well-known broadcasters and brands in the mix utilizing one of the largest independent playout facilities in the Nordics.

At Levira, we have adopted a very open approach towards servicing our customer. Regular communication with our clients and indeed future clients, is essential for gathering useful knowledge of the needs and wants that Levira needs

to cater for. We are convinced that the broadcasting industry business challenges have gained even more momentum than technologies and technical services providers can keep up with today and in the predictable future. Hence, our approach is to again empower the broadcasters and allow for more flexibility to meet their rapidly evolving needs.

Broadcasters still need and will need channel origination with higher flexibility – and cost-effectiveness – compared to the options available today.

Currently broadcasters can choose the playout tech vendor most suitable to their needs, buy the playout system, and start operating it. This model requires high CAPEX followed with staff & other operational expenses. To avoid high CAPEX, there is the opportunity to opt for a full playout service model, defining the functionalities and budgets required for a fixed period into the future. The choice has been rather binary.

There is the alternative to choose a public cloud play-out model, rely on the functionalities available today and hope that the cloud consumption budget will not surprise you due to hidden costs while you are running with it.

Step by step this has led us to move towards the Playout Platform as a Service (PpaaS) business model, tailored to meet individual customer needs. You may need a healthy balance between functionalities, flexibility, sustainability, CAPEX and OPEX in a future-proof manner. This is exactly the point where Levira would like to start the discussion with you!

The process starts with understanding the customer's workflows and needs. We'd like to get insight into your requirements to implement and configure a Levira PpaaS solution tailored to your individual business needs. We can add extra flexibility for you and combine the Levira PpaaS solution with Levira managed playout services simultaneously. This would be valid in the case of the

broadcaster wanting to employ its own staff for business hours operations and outsource the remaining playout hours to Levira.

Levira can provide the playout platform which corresponds to your business needs today and in the foreseeable future. In addition, Levira can add extra functionalities and services layers based on future-proof standards.

Onwards to a more practical approach

Levira has conducted a playout proof of concept system using a SMPTE ST2110 playout network. The platform consisted of equipment required for setting up fully functional channel chains. The system comprised playout automation, video servers, nearline storage, 2D/3D graphics engines, signal gateways, uncompressed AV IP stream analyzers, software based multiviewer, distribution encoders, compliance recording and SDN orchestration.

Initial testing was divided into three categories and was carried out on the functional domain. Our secondary objective was to verify the maturity of the SMPTE ST2110 standard and the stability of the platform, followed by the operational model testing. Proof of concept continued with functionality testing. While Levira was concentrating on the stability and interoperability aspects of the SMPTE ST2110 based play-out platform, our partner, the broadcaster, concentrated on the functional requirements and channel ops. The system was benchmarked against 300+ test



scenarios. What makes the test remarkable was that the playout operator was controlling the platform a few thousand kilometers away.

The remote playout operator was able to control the playout via automation GUI and see the multiviewer mosaic screens, showing the system status and stream outputs of the playout, with unnoticeable delay, low-latency program output signals. The testing was positively concluded. Levira continued the collaboration project by selecting the best playout vendor for the live platform build during the coming years.

The base need for the whole platform resides in the latency. End to end signal chain latency is minimal due to low latency compression technologies and uncompressed signal-chains used, making it hardly noticeable for the channel operator.

The second obstacle was to provide the platform in the most flexible manner possible. Initial ideas went towards the public cloud immediately but costing structures and technical challenges seem not to favor this approach coupled with the idea that private cloud solutions seem best suited for 24/7 live dynamic channels. Hence a more

cost-friendly (for Levira AND the customer) private cloud approach was selected, coupled with public cloud if needed. Public cloud is a good tool for pop-up or event-based channels that gain something from the cloud logic... The speed of set up and pay as you go.

In terms of the private cloud set up – Levira can utilize COTS hardware and hence meets the flexibility and efficiency requirements triggered by the software driven system architecture.

Take back control

Today, Levira PaaS is available as a true Playout Platform as a Service, where Levira handles the platform, i.e., the whole technology and upgrades, and the broadcaster is free to operate the content/channels on the platform. Hence, no technological pains, no upgrade needs, no research costs – the broadcaster is free to focus on their main task – delivering the best content to their viewers.

Therefore, do not hesitate to contact us for advice, expertise or just information you may need; take advantage of our real-world experience to help you take back control and deliver great content efficiently and cost-effectively.



Member Speak – Supponor

A major breakthrough in augmented reality for live sports broadcasting



Tell us about the tech breakthroughs that led Supponor to be able to deploy this multi-area, live virtual advertising solution for ISG for Lega Serie A matches and the Supponor AIR platform.

UK-based Interregional Sports Group (ISG) and Supponor have combined with Lega Serie A to scope, build and deploy the most ambitious and advanced integrated virtual media technology project ever attempted in live sports broadcasting.

Known commercially as Supponor AIR™, this new technology platform integrates powerful augmented reality overlays with traditional broadcast quality solutions. This dramatically enhances the value of media and marketing rights for mass-audience sporting events for sports rights holders, their brand sponsors and broadcast partners. Supponor AIR™ drives the exponentially growing commercial value of TV visible signage during live broadcast of sports events. It offers a fully software-based end-to-end solution, integrated downstream from the production workflow and operated completely remotely.

Simon Burgess, joint CEO of ISG

"This deep collaborative partnership with Supponor in the optimisation & deployment of this advanced technology has enabled ISG to achieve what would have been unthinkable and impossible no more than 12 months ago. In these strange times, not all news is about crisis management, this is a huge positive, a massive game changer for the commercial sports industry."

Supponor AIR™ technology builds on the strong heritage of Supponor DBRLive, widely adopted for over 10 years in top-tier live sporting events. Supponor AIR™ uses Artificial Intelligence (AI) and Machine Learning (ML) to deploy virtual advertising on any surface, in any sport, and in any weather condition. Now commercially and technically proven, Supponor AIR™ provides leagues and clubs with a flexible and powerful marketing tool to continue positioning themselves at the forefront of technical innovation to dramatically increase their commercial inventory and provide sponsors and brand partners with targeted and global reach into local markets.



When delivered remotely, Supponor AIR™ requires no physical integration with the live broadcast production and virtual system operations no longer take place at the venue, and instead can be delivered from a different location, or even different country, regardless of the contribution and distribution format (e.g., satellite, fibre, IP). The insertion of the virtual advertising and the creation of as many virtually modified feeds as required for international distribution, can be enabled fully downstream from the live broadcast production, working on both clean and dirty program contribution feeds.

This revolutionary new AI supported platform operates out of the new Serie A International Broadcast Centre (IBC), just outside of Milan, Italy. The Serie A IBC is one of the most technically advanced and complex broadcast centres in the world. From there, over 100 technicians and production personnel produce all live matches and archive remotely all the Serie A TV, radio, web via 4k production from stadiums across Italy connected via optic fibre. Deployed in record time, the centre was operational from commission to going live for the first game of the season in approximately 18 weeks. ISG's team operates, integrates, and produces virtual goal mats, virtual perimeter VLED, virtual centre circle mats, Virtual 'bench/dugout' and some bespoke additional virtual media for all 380 championship matches a season, including Coppa Italia draws.

Luigi de Servo, CEO of Lega Serie A

"This is a real world first, as we launch one of the world's most advanced broadcast centres, and as Serie A continues the development of its media division...We build upon our previous six years of successful partnership with ISG; launching the most exciting & ambitious virtual media project in broadcasting history. This initiative unlocks the potential for all 20 clubs in our league, generating commercial opportunities in different markets and regions across the world. We are confident that ISG and Lega Serie A will continue their strong union for many more years to come."

Give us a brief history of Supponor

Supponor was founded in 2001 as a pioneer operating at the intersection of technology and commercial opportunity in live sports marketing. Through continuous innovation, the company has continued to grow to become the market leader in delivering virtual replacement technology of TV-visible signage for real-time

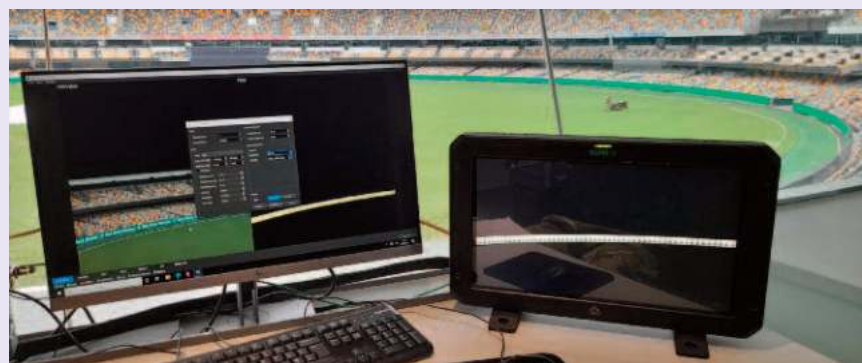
broadcast and streaming of in-venue sports advertising. As a pure-play technology solutions provider, Supponor has over 15 years of experience in research, development, testing, integration and commercial deployment. Supponor has commercially deployed its virtual advertising replacement solutions at hundreds of live broadcast events across 10 major broadcast territories in Football (LaLiga, Bundesliga, Serie A, The FA), Hockey (NHL), Motor Racing (F1), American Football (NFL), Basketball (NBA) and other Tier 1 Sports.

Supponor is based in London and Helsinki, with additional presence in Barcelona, Köln, New York and Australia, and is management owned and backed by leading VCs, strategic partners and institutional investors.

Supponor's technology is based on 100% proprietary, and wholly owned IP which has been developed in-house by the Supponor R&D team in Europe over the past 20 years.

James B Gambrell, CEO Supponor

"Through continuous innovation we have established ourselves as trusted partners to deliver market leading virtual advertising solutions that maximise returns for rights owners, brands and broadcasters in top tier sports around the world."





What's next for Supponor?

We aim to support the delivery of virtual advertising or signage solutions for any rights owner, in any sport, on any surface, anywhere and at any time.

Therefore at Supponor the next driver is to continue delivering our proven broadcast quality solutions but at a huge scale. Scale to us concerns production and distribution. In production, scaling will relate to the sheer number of events we will be delivering effectively and efficiently for partners across the globe. We will achieve this using multiple methods as we have always done to support the working practices of our partners, but as the industry itself transitions, we will have an increasing focus on centralised, remote and even cloud based operations, the latter already an area in which we are seeing exciting progress. Similarly, on the distribution side, we are already seeing increasing demand for more output feeds. Technology is opening up opportunities to deliver ever more increased personalisation in both linear

broadcast, utilising cost effective, high quality and resilient point-to-point (PTP) delivery over the internet, but also within the exploding OTT and D2C live sports market, which can be either rights owner operated or pure play OTT sports aggregators, where hyper-targeting and almost individualised personalisation becomes a reality.

Our focus has always been on partnerships, but even with this primary focus we realise that with the opportunities ahead of us we need resources, so over the course of this financial year we plan to double our global headcount to support the rapid increase in the number of events Supponor is delivering and to support further expansion in Europe and rapid growth in the Americas, Australia and Asia.

We fully expect to continue our growth from an average of 100 events a year 2 or 3 years ago, to over 1,000 in 2021/22 to an already planned 2,500+ in 2022/23 and onward to 5,000 events a year within the next three years.



James B Gambrell, CEO Supponor

"This is a remarkable time for Virtual Advertising and for Supponor, as we continue to transform the market with our highly disruptive technologies and solutions. We have been a trailblazer in the development of innovative, software-based, scalable Virtual Advertising solutions and this is what has helped us record such great market success. As the market transforms, we will be scaling our business to support the growing market opportunities as we grow and consolidate our market leadership position within Virtual Advertising."

We...handle scripts, metadata, synopses and a lot of other information around video content in order to automate and streamline the workflow for our users

Member Speak – OONA

What is the story behind OONA? How did you decide to set up the company?

OONA was founded because we needed a platform to manage internal subtitling work at a localization company in Tel Aviv – Trans Titles. After searching the market for such a platform and seeing there wasn't one, we decided to hire a company to build it for us. To cut a long story short, things didn't go well and Gal, now OONA's CTO, was sent to smooth things over; that was the start of a great partnership. Since there was a gap in the market, we realized that this would be a product that would be of interest commercially to other language service providers (LSPs) too, so we decided to set up OONA as a separate company, as we don't believe an LSP can be a software-neutral company.



Wayne Garb
CEO, OONA

How did things evolve for OONA? How did you come to be the company you are today?

OONA started off as a translation management platform for media localization work – the web-based timed-text tools came later. The original demand for the tools came from our platform clients, who needed timed-text tools to upload materials and have their production teams check them and make edits.

We built the timed-text tools separately and fully integrated them into the management platform, but kept the whole thing modular so clients could choose to license only the management platform, or only the tools or some of them, or go for the complete end-to-end solution, which we called OONA Integrated. We used to handle only subtitle and caption files, but now we also handle scripts, metadata, synopses and a lot of other information around video content in order to automate and streamline the workflow for our users.

How do you see the company's place in the market now?

I believe we are the only fully integrated, secure and certified, web-based platform that works on all main operating systems which is not an LSP. As such, I don't think we have a lot of competition. We offer professional, state-of-the-art tools for audiovisual localization at realistic prices, starting with pay-as-you-go weekly

subscriptions, so we can be affordable just as much to freelancers as to large enterprises.

You bring up AWS and security often in conversation – why is that?

As our client base grew over the last few years, we realized we needed to be on AWS and guarantee the security of our clients' content. Security is indispensable for growth, as no major content owner will trust or be willing to work with vendors that do not satisfy this condition. So we spent an entire year carrying out multiple penetration tests, we got our ISO 27001 certification and we've recently passed a number of security audits from major streaming platforms too.

We also invested a lot of money to create a scalable solution. We wanted our system to be elastic in terms of the number of users it can support – and we have thousands of users all over the world. We work with an external company who are an AWS partner and offer 24/7/365 support.

We have multiple servers on AWS and the system scales automatically according to load, CPU usage and traffic. This ensures our users' experience of the platform is always smooth and it helps me sleep better at night.

What's on your development roadmap?

We've always been driven by market needs and demands. Our primary goal is to be a one-stop-shop for our clients and to be able to serve the global media localization market. We have just rolled out support for Japanese timed text, so I'd say this goal has now been achieved.

We don't believe in reinventing the wheel, so when a tool already exists that fits a specific purpose well, we use APIs to integrate it so as to be able to offer it to our clients. We wish to offer them a selection of everything they could possibly need, integrated into a single workflow. As an example, we work with AppTek for speech recognition and machine translation because they offer specialized models for the media market. We are also in the middle of a proof of concept with memoQ for translation memory functionality, which is something that is requested a lot by our users. Translation automation in general is a very hot topic right now and it is certainly on our roadmap.



Our aim is to create tools that the end users love to work with, so we use input from translators to guide us on this. In short, we see ourselves at the heart of the localization workflow, as the core platform that integrates everything our clients require to fulfil any need they have.

What is your vision for the company?

A lot of people ask me this question. We don't see OONA today as a software company with a set of products; we see it as a complete solution that services all the needs of the media localization market. We strive to offer literally everyone access to great localization software, so even a single subtitler could start their own business and have the comfort of working in the same system that a large company uses and enjoy all the benefits that come with it. It's about supporting the market and making it sustainable.

We want OONA to be a brand synonymous with the media market, that can cover any localization need, whether it's for production, training or resource onboarding purposes. This is why we developed an

educational platform as well – so people could continue being trained properly, especially in the midst of the pandemic: there are currently 25 universities and colleges using our EDU platform. It's also why we took the initiative to create the infrastructure for the POOL, with the support of many LSPs, academics, unions and translators themselves. We're actually reaching out to other software providers as we speak, because we would like everyone to be a part of it.

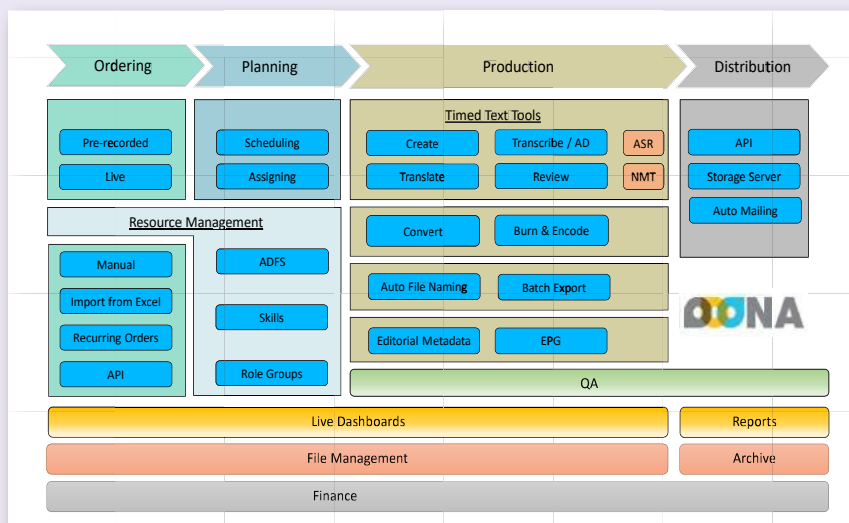
What's next for OONA?

We have a great team at OONA that continuously goes above and

beyond expectations and who our clients love working with. So, first of all, we want our staff to continue to feel part of the company and enjoy working here. It's been a bit like working with family all these years and we don't want to lose that feeling – that's important to us. We also aspire to be the industry standard when it comes to enterprise-level tools for the media space. We need to expand as a company, as the market is demanding more and we must expand to meet this demand. We want to keep being the best management and production solution out there while having as wide a reach as possible. So we have plans for expanding in new locations too – but let's leave that for next time!

<https://oona.net>

This is an updated version of an article first published within the GLOBAL InBroadcast magazine, August 2021. It includes references to functionality that was not available in the OONA platform when the original interview was published.



Our job is to help the clients get the purchase order. We use lots of techniques and tactics, but the only point is to make sure our client companies sell more of their technology, and that they are regarded as the obvious choice

Member Speak – Manor Spirit from Manor Marketing



Jennie Marwick-Evans
Founder, Manor Marketing

Manor Marketing, one of the most respected marketing and communications agencies in the broadcast and media industry, celebrates its 20th anniversary in 2021. Industry veteran Dick Hobbs chatted with the founder of Manor Marketing, Jennie Marwick-Evans.

We've known each other for a very long time. How did you first get dragged into this strange and unique industry?

Growing up in Newbury, UK, the two big employers in the town were Bayer and Quantel. When I left college at 18, I picked Quantel – a very good choice in the end.

I spent three years at Quantel, where I supported the sales team. In those days you had secretaries, and I did the typing, making sure all was well. Quantel was very good to me: they sent me on courses to learn Spanish, and they flew me to the Montreux exhibition on the company jet (I think the jet was going anyway – I just sat in a spare seat)!

It was the absolute heyday of Quantel, and that sales team of 11 included some legends of the industry, who are still friends and colleagues now. I was proud to be part of ground-breaking technology that is still talked about today.

So, three years at the leading light in the UK broadcast market. Where next?

I did a couple of other jobs, but ended up at a company called Alpha Image, where I was PA to MC Patel, who is still a massive part of my life today.

Alpha Image was acquired by Dynatech Video Group and, as I was on the spot, people gave me stuff to do. I got involved in internal sales and

marketing, which is where I learned my trade. I ended up running the European operation of Utah Scientific, another Dynatech company. I can still tell you all you need to know about routers – just ask me!

I naturally got to look at the competition, and it was very clear to me that there were a lot of British companies coming up with very clever products, that did not know how to sell them. So, I set up my first company, Jet Video Systems, acting as a distributor for some of them.

One of my biggest clients was Metawave Video Systems, and they tempted me to join them as sales and marketing director. I was with them as they were acquired by another broadcast manufacturer, and by 2001 I was looking for another challenge.

I was well-known by then, and a lot of companies tried to entice me. But I had sold against them in the past and I felt it would feel uncomfortable suddenly changing sides. So, in 2001 I set up my own agency. I was living in Manor Place at the time, so I called the company Manor Marketing.

Setting up on your own is exciting and scary. I know: I've done it. Who were the clients that got you going?

The first clients were Pro-bel and Chyron. Others, like TSL and IABM, followed on quickly. Since then, I've been fortunate – we've always

attracted clients without having to aggressively sell ourselves.

Your background is in sales, the company says marketing, and you are often thought of as a PR business. What is Manor Marketing?

I am really clear about this. Our job is to help the clients get the purchase order. We use lots of techniques and tactics, but the only point is to make sure our client companies sell more of their technology, and that they are regarded as the obvious choice.

Because I've done everything from making the tea to sales direction, I understand what it takes. I'm still a sales girl at heart, but now I get my commercial fix through marketing, promoting the brand and drawing on the expertise of the clients to help them win sales and therefore, recognition. And I still make the tea!

How do you recruit, retain and motivate your team?

I'm never going to ask anyone to do a job I haven't done myself. And I do those jobs now as required.

But I'm very definitely a people person, and enjoy working with colleagues to get the best out of them – and fill them with my enthusiasm, I hope. I love employing new graduates, building their confidence and capabilities, and challenging them to be the best they can be. It's the same with people coming back to work after



a break, for whatever reason. Everyone deserves a chance to be proud of themselves. That's one of my drivers.

One other important team principle. I expect us all to work hard and be boundlessly enthusiastic. Until 5.30. Then we all go home and do our own things. I regard getting the work/life balance right to be vitally important. Of course, people who know me well would say that for me, this is an aspiration not always successfully practised...

I'm also excited by new technology and new ways of doing things. I thrive on challenge, and risk. At one time we solely relied on the trade press to get our news out. Now things move much faster, and we can directly message potential purchasers with tailored messages, for example. We use social media carefully but extensively. As the world changes, what we do has to change too. Business continuity is now the theme, with digital marketing and communications the route.

Many of the team have stayed with me for years. Some have even left to set up their own agencies! That's fine – the market is big enough for a number of excellent marketing communications businesses.

How would you encapsulate the way you do business?

The first thing to say is that I take trust, responsibility and reputation

very seriously. I've been around a very long time, know many key players, and my passion for the industry is still as strong as ever. That's obvious in my long-standing involvement with organisations like the RTS and IABM, as well as IBC and NAB.

That principle leads into our association with clients. We are not a distant service. We see ourselves as embedded in their business, a part of their team. They trust us to just get on with it.

That's why the reputation for trust is important: our clients can freely discuss their long-term strategies with us, which makes us very much more valuable than being reactive. Putting out a press release for a new product or a sale is important, of course, but even more important is building the market for that product or creating the path to winning that sale.

And in turn, it means our clients stay with us far longer than is typical, which I continue to find flattering. Taking that further, I am regularly asked to be a consultant or marketing director for client companies. I am currently marketing director for three businesses, steering their operations to build commercial success.

So: 20 years. How are you marking the anniversary?

We thought about our values as a company. Trust and confidentiality.

Reliability – if we promise something, then it will be there on time. Insights. Constant innovation, like digital tools and social media. Understanding.

And enthusiasm. Enthusiasm is at the heart of everything we do.

That, we felt, was the Manor spirit. And so, to celebrate, we created Manor Spirit, our own blend of gin. It took a lot of research, tasting and testing to get it right: a tough job, but someone's got to do it. I'm really looking forward to playing Santa this year!

What next?

More of the same. The team – including a couple of recent recruits – is still excited by the work of our clients, and the industry in general. Our clients cover every aspect of the business, from lip sync to video compression pre-processing, subtitling to servers, playout automation to augmented reality.

We know and understand the media industry. It's changing so fast at the moment, through the shift to IT hardware and principles, and the sudden enforced rush into remote production and the cloud. There is more than enough to keep us occupied: I have no desire to weaken our core values by moving into other markets.

Our current crop of clients all have order books that are constantly being filled. We have plenty to do!

Member Speak – ViaLite Communications



Amair Khan
*Business Development
Manager, ViaLite
Communications*

Tell us about the company – when it was founded, by whom and with what objective?

ViaLite Communications is a division of Pulse Power and Measurement Ltd (PPM) which was founded in 1994 by Neil Seager, who still remains an active and key member today. Operating out of its headquarters near Swindon UK, the company started out as a distribution business but developed further with manufactured technologies such as RF over Fibre (RToF). RToF has become a key product offering in all of the company's manufacturing divisions.

Fill us in with how the company has developed and grown to the present day

ViaLite has grown significantly over recent years; working alongside key customers around the world, adding local offices in the USA and Thailand. It's also set up a network of highly experienced channel partners across the major trading countries; they typically come from the satcom and communications markets.

The RF over fibre market is a competitive and buoyant place as it is widely used across satcom and wireless technologies including GPS / GNSS, broadcast television, cellular and wireless telemetry.

Through constant product innovation and using skilled technical account managers and channel partners, ViaLite has continued to grow its customer base and market penetration. By 2016, ViaLite had installed its 10,000 fibre link. PPM and ViaLite has continued to increase its headcount and

investment into the employee capability, and PPM recently renewed its Gold Investors in People status. With a team of over 60 employees working from the PPM HQ and remotely, the engineering and development teams are defining the next generation of fibre links to meet future broadcast, satellite, defence, and time and synchronisation needs.

In 2021, the company was acquired by BAE Systems and has become a wholly owned subsidiary, giving PPM an owner which shares vision and synergies in high technology development and customer base. The acquisition further supports the growth PPM have seen in US sales in both the commercial and aerospace telemetry sectors.

Today ViaLite supplies RToF to the top eight World Teleport Operators and many of the top broadcasters around the globe. Several sites now have in excess of 500 links installed already, connecting up hundreds of satcom antennas between the

outdoor and indoor locations.

What are your typical sectors and how do you compare to the competition?

Broadcast, satcom, aerospace and time and synchronisation are the key areas which we regularly supply into. Our satellite and broadcast markets are probably the biggest areas where we supply products for satellite downlink and uplink where data and video is distributed across GEO satellite networks.

Broadcast is another strong market for ViaLite where customers take our RF over fibre modules and integrate them into their own equipment for wireless camera links. These camera links are often used for filming sporting events with video content being backhauled to the studio or the OB trucks for processing.

Our fibre links are used extensively in the broadcast area covering major sporting events such as the Olympics, motor sport, tennis,



soccer, NFL, ice hockey and even sailing. The key suppliers we work with on broadcast prefer our products due to their dynamic range and also their small form factor which makes it easier for them to build the products into their chassis equipment or IP rated outdoor equipment.

The ViaLite links operate with low power consumption which gives them the added benefit of longevity when used with battery powered systems. With the world going greener we have already given customers the option to use our products with approximately half the power consumption compared to others on the market.

The broadcast market is a very cost sensitive market where clients want to keep their capital expenditure as low as possible and use equipment over and over again to get the best return on investment of their kit. To help with this cost reduction we

have developed certain products which offer flexibility and quick changeover. Our latest product is the Blue OEM 1U Chassis where modules can be fitted into this chassis as and when required, and also replaced quickly and easily with different frequency versions if needed. The unit itself runs on a 12V power supply supporting up to eight fitted fibre modules. Broadcasters like this solution as it only takes up 1U of space in a rack or in a OB truck where space is limited.



On top of this ViaLite has also developed a wideband frequency 6GHz RFoF module which is IP55 rated for outdoor use with an outdoor IP rated power supply. This product covers a wide frequency range and offers customers the ability to change settings using USB-C connectivity on the module. The module also comes with the ability to supply an antenna and can even monitor active antenna faults. Again, for deployable solutions, this is a quick and easy way to get up and running in a very short time; ideally suited for outdoor news crews where a fibre link may be needed quickly for breaking news stories.

A key achievement includes helicopter broadcast systems where during motor racing events the helicopter video link is backhauled using a network of trackside antennas which are fibered through to the video production desk. The



single-seater formula racing cars, not only use our fibre links for broadcast but also incorporate them for trackside comms and wireless microphones.

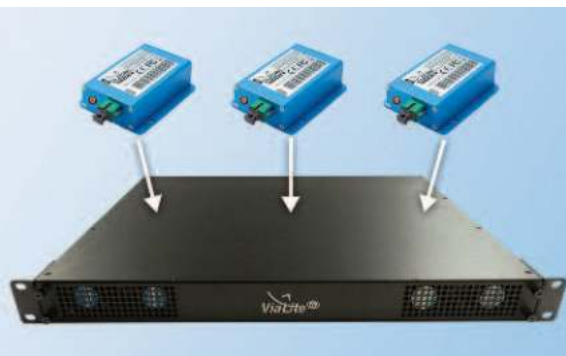
Numerous broadcasters around the world use our fibre links to broadcast audio for shows where wireless microphones are used in studio or outdoor operations.

Time and synchronisation for the broadcast industry is becoming increasingly important, as part of our broadcast customer needs we also provide GPS/GNSS fibre links which provide signals to go into broadcast equipment such as sync pulse generators or NTP enabled time servers. This allows accurate time to be distributed within the establishment to support operations.

What is ViaLite's philosophy and aim?

I'd say error free, reliable RF over fibre links and the best all round experience possible.

The broadcast industry continued its technology trajectory moving towards the higher definition broadcast and streaming television standards. Now, with 4K definition requiring throughput rates of 15 to 25 Mb/s, and 8K requiring 80 to 100 Mb/s – depending on frame rate, higher performance camera and backhaul equipment is needed. With these greater bit rate applications being asked for, ViaLite links are suitable to support 4K and 8K video



transmissions which broadcasters are looking to deploy.

Who are your typical customers?

Customers include those integrating products into their broadcast setups, broadcasters themselves, OB truck operators, satellite uplink/downlink operators and global media operators.

Our customers include the BBC, ITV, SKY, NEP, Euromedia Group, CTV, Broadcast RF, Broadcast Wireless Systems, DTC, Broadcast Rental, Vislink, Videosys and Prestigne.

ViaLite also supplies most of the major teleport gateway customers globally, providing carrier grade links to support their television and broadband services.

Fantastic. Why do your customers choose you – what is your secret sauce?

ViaLite has been developing fibre links for over 26 years and we know what we are doing to achieve superior reliability, performance, small form factor and low power consumption. Our links offer the best dynamic range to allow low and high power signals to be transported over fibre easily. Our standard fibre modules have been developed to cover up to 10km, but we have the know-how and products to achieve much larger distances in the 100's of km if required.

By providing RFoF links which can be used with batteries for deployable solutions our links retain their performance where no mains power may exist, allowing our customers to drop off equipment and run immediately. Events like marathons, rallying and cycling are typical events where this happens.

The winter and summer games are typical events where our fibre links can be used in varying climate conditions. The links retain their performance at temperatures around -25 °C and also at +50 °C! One of the main reasons why broadcasters use the links is that they can send the kit around the world, where climate conditions are different, and still rely on fully operational links and performance to match what they need.

What issues do you see in the market?

COVID has obviously affected many areas of daily personal life and business; outside broadcast and events were negatively impacted.

The market has improved significantly over recent months, but we are still some way off global freedom to travel, and large scale

sporting events have mostly national audiences.

COVID has also accelerated the adoption of internet and cellular based broadcast communications using OTT video applications. The quality may not be as good when comparing to the bespoke video broadcast we had traditionally pre-COVID, so it will be interesting to see how this plays out over the longer term with trade-offs between video quality versus bespoke or bit-rate limited connections.

As IABM members, what services do you most value and why?

Support through discounts when exhibiting at key shows – leaves some budget to spend elsewhere. Promotion in marketplace (news coverage on website and in social media, IABM Shop Window etc.).



New Member – **ENDAVA**

Digital acceleration in broadcasting

Digital acceleration is impacting every market and company in the world, and the Broadcasting industry is being particularly impacted. This industry is needing to adapt in two different ways at once: not just the way in which consumers discover and access the products and services but the actual media products themselves are becoming digital. This near-constant evolution and transformation is causing real disruption, whilst also welcoming a multitude of new opportunities.

Endava at a glance

Endava is reimagining the relationship between people and technology. By leveraging next-generation technologies, our agile, multi-disciplinary teams provide a combination of Product & Technology Strategies, Intelligent Experiences, and World-Class Engineering to help our clients become more engaging, responsive, and efficient. The solutions we offer help our clients navigate their way through digital transformation and enable them to stay ahead of the competition through continuous digital evolution.

Our work in the Broadcasting space

From the digitalisation of complex infrastructures to enhanced personalisation, together with our clients we develop user-friendly, agile solutions which enable them to innovate their digital operations and provide improved services to their customers and users.

We support our Broadcasting clients with a range of services, enabling them to:

- **Improve and extend content exploitation** – we help content owners and aggregators re-purpose their content via standard channels, like video, web, mobile, as well as challenger and future platforms, like Augmented Reality (AR) and Virtual Reality (VR), and to adapt their business models to exploit these changes and protect their businesses.
- **Use data in a smart way** – we help our clients get actionable insights from the vast quantities of data they have available, aiming to increase loyalty, user satisfaction and profitability.
- **Operate more cost-efficiently** – we help businesses optimise and automate their processes in order to drive costs down while increasing the number of products and services they can offer.

A real-life example

We supported a major European public broadcasting organisation in developing, maintaining, and continuously evolving their digital offerings. Keeping in mind the broadcaster's mandate to provide offerings for a very diverse audience, their new online media library combines the traditional television experience with neat live and on-demand streaming offerings and interactive social media functions.

The result is a diversified digital offering that is available on the web and all popular mobile and TV platforms. It is popular with a broad range of users but especially with younger audiences compared to linear TV. With user satisfaction ratings of over 80%, our client's digital offering is among the top-rated streaming services in its region – on one level with global streaming heavyweight Netflix. With our joint efforts, our client is able to reach and constantly push further the mark for their digital goals.

Learn more about us at www.endava.com

20+
YEARS
EXPERIENCE

50+
SMEs

1,000+
FTEs

100+
ACTIVE
PROJECTS

50+
ACTIVE
CLIENTS

New Member – Brompton Technology



Richard Mead
CEO, Brompton
Technology

Brompton Technology: Making LED play nicely for in-camera visual effects

In-camera visual effects using LED screens have moved very rapidly from a pioneering specialty to a mainstream technique being widely used across film and television production. The fundamental idea is to do your visual effects 'in camera' by filming the action against a display showing the background scene, rather than using green screen and adding the background in post.

That idea is not new, but the latest fine-pitch LED has significant advantages over other display technologies and can create flexible LED volumes that typically also include ceiling and wrap-around elements to provide realistic lighting. Large volumes for virtual production are now being built all over the world and kept busy producing major motion pictures, commercials, and iconic sci-fi and fantasy series, such as the latest, highly-anticipated series of Emmy-winning *Star Trek: Discovery*, which has just premiered on Paramount* and was shot on Pixomondo's flagship virtual production stage in Toronto, Canada.

Alongside filmic production, many broadcasters have successfully embraced this new cutting-edge technology to bring major events to life in-studio, such as Fox Sports delivering the world's first live to air xR broadcast at one of the most prestigious sports events on the National Rugby League calendar, the Dally M Awards. And the Serbian commercial television station, TV Nova, deployed the technology to give its viewers a unique view of the Perseverance rover landing on Mars. From being able to put the viewers in the driver's seat at the Formula One World Championship to bringing



Brompton Technology's Tessera SX40 to deliver world's first live to air xR broadcast at the Dally M Awards.

them into the eye of the storm, or even dropping them into Earth's deepest, and possibly most alien realm, *The Mariana Trench*, these extended reality techniques can help build more informative and immersive broadcasts. The smart money is clearly betting that this is how much of our film and television content is going to be created in the future.

Early adopters working with LED screens didn't always have a smooth ride. LED screens that were not designed with use on camera in mind can turn out to be unsuitable, and the wrong LED solution or the wrong pairing of screen and camera causes more problems than it solves. Even when working well, the

LED screen was often a fixed point that every other department had to adapt around. But, despite those challenges, the technology's multiple advantages mean the market for LED in virtual production has grown rapidly and manufacturers are responding with products tailored to its needs.

Brompton Technology is an established market-leader in video processing for LED walls for live events, film and broadcast, and started out developing products to meet the demanding requirements of the world's largest tours, corporate events and award shows. LED video processing is the catch-all term for everything that happens between receiving source video and



PXO's Virtual Production (VP) studio in Toronto, driven by Brompton. Picture credit: Pixomondo (PXO)

the actual LED driver chips within an LED panel. It typically consists of a processor that receives the video signal, does any necessary formatting and adjustments, splits the image into chunks that map to each individual LED panel and distributes that data to the panels – most commonly over Gigabit Ethernet. Within each panel is a receiver card that converts the video data into linear light control signals for the LED drivers.

The video processing is sometimes overlooked as just the mapping function of the LED panel, but in reality there are many technical challenges in ensuring perfect synchronisation, achieving the lowest possible latency, correcting for the many non-ideal behaviours of LEDs and LED drivers, and managing the many trade-offs that arise from trying to squeeze the maximum performance out of an LED panel. Having the right

processing is every bit as important as the choice of LED panel itself, and if you don't know what processing is inside an LED panel then you can't know what behaviour to expect.

Brompton has been working hard to ensure that the LED screen becomes a collaborative partner in the creative process rather than an obstacle to work around. This is an ongoing process of working with users to understand the pain points – then developing new features or integrating with complementary technologies to create a more optimised workflow for virtual production.

For example, creatives are used to being able to adjust their shutter angle to achieve a particular creative effect or manage motion blur. But with an LED screen in the mix, they have often been restricted to selecting a specific shutter angle to avoid visual artefacts. Earlier this

year Brompton introduced ShutterSync®, a feature that allows the refresh timing of the LED screen to be adjusted to match the chosen shutter angle of the camera – putting creative control back in the hands of the user.

It is a similar story with colour, where LED screens can vary wildly in their achievable colour gamut and accuracy of colour reproduction. Brompton is a pioneer of Dynamic Calibration, a technology for LED that ensures accurate reproduction of colours within the gamut and intelligent management of out-of-gamut colours. Dynamic Calibration also underpins its implementation of HDR video, which is increasingly becoming a requirement for virtual production – in part due to the ability to encode absolute colour and brightness information into HDR content, which can then be faithfully reproduced on the LED



Sonequa Martin-Green (center) films a scene in Pixomondo's AR wall stage in Toronto. Picture credit: Paramount+

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Brompton Technology and Faber AV (part of the NEP Worldwide Network) offer sneak peek into the future of Virtual Production

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Where custom colour management or on-set grading is required, Brompton's Tessera processors support import of 3D LUTs (Look Up Tables) in industry-standard .cube formats. The capability to manage those 3D LUTs is now integrated into leading tools such as Pomfort Livegrade, so that Digital Imaging Technicians can now grade an LED screen in the same way they would manage any other monitor. There are now even workflows available to support multi-camera

virtual production shoots using LED screens. These rely upon Brompton's Frame Remapping technology – which allows multiple different content streams to be interleaved so that a frame from each stream is shown in turn. Each camera can run at a different genlock phase offset so they each see their own unique content on the one screen. The typical application in virtual production is to allow different camera positions to see a background with the correct perspective.

Every project has a different workflow so there is no 'one-size-fits-all' approach. The key requirement is product reliability and flexibility that allows them to produce high-quality, immersive content at a faster pace. From smaller LED setups to larger volumes like those used on The

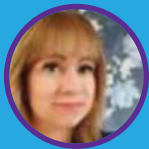
Mandalorian, LED screens can deliver new possibilities to teams of all sizes.

The last 24 months have seen rapid, widespread adoption of virtual production using LED, and equally rapid advances in the technology available to make the LED screen a full partner in the creative process for film and broadcast production.

By strategically utilising virtual production technology, broadcasters can gain an edge over the competition to present the information in a unique and immersive way, in real time, and with captivating graphics. Brompton Technology is continuing to support its many users in the space and advance the state of the art for virtual production and extended reality using LED.

New Member – Visidon

Technology to enhance the quality of archive video – a new tool to increase viewer engagement and monetization of existing libraries



Jenna Enbuska
*Head of Marketing,
Visidon*

Finland-based company Visidon, founded in 2006, specialized in the development of AI-based image and video enhancement software. The company is a well-known supplier for the top mobile OEMs around the world. Lately, the company has utilized its long experience and has further developed its technologies to serve the broadcasting and video delivery industry.

New video enhancement solutions to bring archived video content up to date

"We have been focusing on developing software to improve the overall visual quality of archived video streams. With our long experience from optimizing algorithms to embedded platforms, we are well known for delivering technologies that are optimized both in accuracy and computation performance," says Visidon CEO, Markus Turtinen.

The main challenges, that Visidon's clients want to solve are related to low visual quality of video streams including interlacing, low resolution, noise, artifacts, and low frame rate. The new technologies for video enhancement include for example super resolution, frame interpolation, deinterlacing, and noise reduction. Super resolution refers to AI-based upscaling from lower resolutions to 4K or 8K, which makes videos streams compatible with modern displays. It also increases details and clarity in the

video. Frame interpolation increases the frame rate and makes especially fast movement, like sport content, look smoother. It also allows creation of slow-motion clips. Deinterlacing converts interlaced videos to progressive scan, and noise reduction enhances the quality of noisy low-light video streams.

According to Visidon, the long experience and strong background in visual quality improvement and computer vision applications makes the company stand out from the competition. Being at the forefront in delivering superior imaging and video enhancement quality for hundreds of millions smartphone camera users during the past years, means that Visidon has gained unrivalled experience in creating high performing software products. Limited computational power on battery-based devices has driven Visidon to develop fast and energy efficient solutions. Also, in the video industry there is high demand for processing a massive amount of video streams efficiently. Bringing

exceptional visual quality and restoring videos at a reasonable hardware cost will be important in scaling to the huge amount of video contents that is broadcast and streamed today and in the future.

Broadcasters and content delivery providers utilizing AI to restore old videos streams

Broadcasters worldwide are looking for ways to differentiate themselves. They have large libraries of archived video content that could be utilized to generate more revenue streams and to widen their content portfolio, as well as to attract a wider audience. Visidon has already been collaborating with broadcasters from different continents to bring their old archive video content up to date. This is done with technologies such as super resolution and de-interlacing.

Most current domestic TV's support 4K resolution and viewers are even expecting to see their favorite childhood series and movies in 4K format but of course most of these



are still in SD quality. And here comes the problem: SD quality translates into a resolution of 720x576 pixels at best, which is only 5% of the pixel count of a 4K screen. This means that a standard 4K TV is converting the stream by enlarging each frame 20 times in order to fill the entire 4K screen. This usually results in a blurry image. If the video source file is processed with Visidon Super resolution, an AI based neural networks does the upscale and instead of enlarging each frame, AI adds realistic detail to the 19 newly generated pixels for each pixel of the original video and the final 4K result has a lot more details than the conversion done by traditional scaling methods used in

display hardware. A lot of the old video content is also interlaced, and Visidon has developed their own deinterlacing technology for smart conversion into progressive format providing a significantly better outcome compared to industry standard approaches available – for example in ffmpeg.

Another option for upscaling the content would be traditional remastering, which means scanning the original film digitally frame by frame. Compared to relatively fast process of AI-based super resolution utilizing neural networks, this is extremely slow and can rarely be justified from a business perspective.

Visidon one of the newest members of IABM

Visidon has just joined the IABM network and is more than happy to receive inquiries around visual quality enhancement of videos. Visidon is offering flexible licensing and business models and as a member of the IABM network, the company aims to be even better informed and connected with the media and video content delivery industry in order to further develop our solutions to enable our clients to provide better video quality and greater viewer experience.

www.visidon.fi

jenna.enbuska@visidon.fi

New Member – Caton



Jason Ho
*Senior Business
Development Director,
Caton Technology*

Balancing cost and quality

We do not need to talk around the concept of IP connectivity in media: that argument has already been won. For contribution circuits – from remote events and locations back to base – there is also an acceptance that IP is the way to go.

But there are a number of potentially conflicting constraints:

- **accessibility**
- **reliability** – images and sound have to arrive in synchronisation, with no freezes, glitches or significant latency
- **quality** – consumers expect crystal clarity, especially in sport
- **cost**

These would have been live issues now anyway, but the pandemic and the absolute need for remote working has forced the issue. Broadcasters, and particularly sports broadcasters, have scrambled to find solutions. This year's IBC Awards are dominated by remote production solutions, from the Olympics to e-sports.

Finding the bandwidth is the issue. Where once we could turn to C-band satellites, that spectrum is being transferred to 5G (and 6G) cellular and thus unavailable for ad hoc links.

Major venues will have large amounts of dark fibre capacity, which is fine. But that does not apply to secondary venues, and certainly not to the makeshift studios and production control rooms set up in people's homes.

Adding fibre links means months of planning and installation. It also

means commitment to a lengthy contract: most people cannot consider committing to paying for a service for years when they want it for hours.

The solution is already in all of our hands: the open internet. It can be implemented at very short notice, and you only pay for what you get.

But internet bandwidth will be constrained and not necessarily deterministically provided. You need to use codecs which deliver the optimum quality for the bandwidth available, and most important you need a transport layer which provides quality while working within the network limitations.

While the IP advocates talk about the benefits of open standards and COTS hardware, the inescapable fact is that professional video is a very different – and very much more demanding – data stream than anything else. So the transport protocol must be designed for realtime, broadcast-quality transmission.

At Caton we call this Caton Transport Protocols (CTP). We designed it for international transmission over open IP networks, while providing the service assurance that broadcast users expect.

As well as reliability, it also meets the challenge of quality. Sports broadcasters routinely expect 4k and HDR Ultra HD. At Caton we successfully demonstrated 8k delivery two years ago.

A second quality consideration is synchronisation. If you need to carry multiple sources over the public internet, where each individual stream will take a different path, the chances of sync errors grow rapidly. But in sport, all the sources have to be timed, and the audio and video locked together, or the audience will immediately lose faith in your coverage. If the audience cannot be intuitively sure what is actually live, you lose credibility.

Quality, latency and synchronisation are relatively easy to maintain from point-of-presence to point-of-presence, and service providers will be comfortable in offering, say, four nines reliability on that basis. But that is not what users want: they need to be confident in the circuit from location to the studio, so they expect last mile performance to be part of the SLA. That much more challenging requirement is part of CTP.

Once you accept transmission over the open internet, then it is as easy to route signals to the cloud as to



anywhere else. So you can simultaneously write to cloud storage while broadcasting live, and make the content available to multiple remote editors.

Again, this is not new, but most cloud editors depend upon low-resolution proxies. Caton has applications which overcome the limitations of VPN to allow the editor to work on real content. Putting the material in the cloud means you can apply big data, processor-heavy tasks to gain added value. You might, for example, use artificial intelligence to accelerate and automate localisation.

In a simple application, this could be generating scores and information feeds in multiple local

languages. But if you apply video analysis and face recognition, you could automatically generate descriptive reports and live text commentary, extending the reach with no additional operational cost. The sports audience is very diverse. The hardcore fans will want rich statistics and detailed analysis from former players. But a much larger part of the audience wants to enjoy the game and, with a lower starting, will have more to gain from carefully-pitched additional information.

That is important because if you draw in the casual viewer, you popularise the game through understanding. If you popularise the game, you grow your audience. If you grow your audience, your grow your revenues.

The latest Cisco research says that 82% of all internet traffic will be video in 2022. Of course, much of that will be social media and YouTube, but premium quality video will play its part. Using appropriate tools, like CatonNet Video Platform (CVP), means that the public internet can deliver against the broadcaster's four criteria: accessibility, reliability, quality and cost (and new revenue opportunities).

Remote production, in any genre, can now reasonably be expected to deliver uncompromised quality and synchronisation, automated localisation, and increased viewer engagement. That is a huge advance for the industry.

The FLICS solution is available for file-based transcoding use cases, adaptive bitrate encoding, and live recording and live transcoding applications

New Member – Hiscale

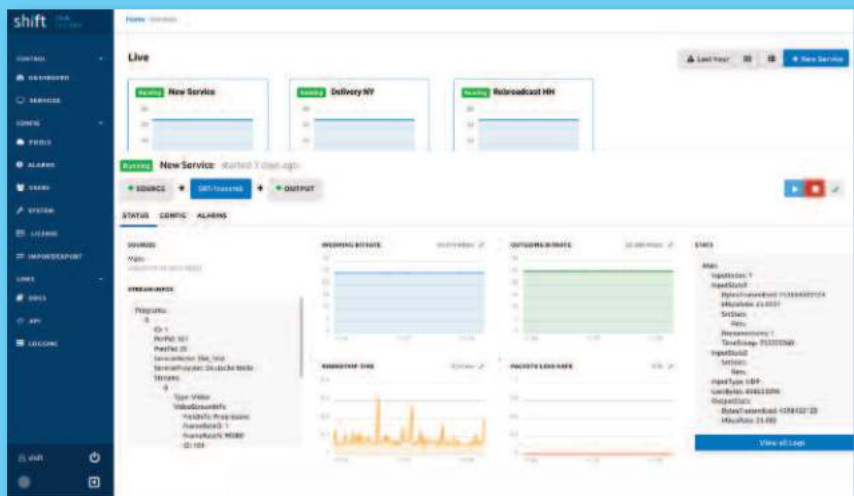
A leading German software vendor for scalable transcoding and workflow solutions joins the IABM family

Hiscale designs and develops powerful, scalable and modern software products for customers in the broadcast and media industry. The company is headquartered in Cologne, Germany. We leverage the latest technologies to ensure that our solutions meet the requirements for rapid deployment and cost efficiency, and enable flexible business models with cloud-based, on-premise or hybrid use of technology.

At the heart of the Hiscale portfolio is the FLICS product, a modern, flexible and high-quality transcoding solution designed specifically for broadcast and VOD applications, addressing common problems of traditional static transcoding installations. FLICS is fully based on modern cloud native technology and can be deployed on standard server hardware, in virtual or cloud environments, and in hybrid scenarios. It can dynamically manage cloud resources and set up new instances, automatically provision the transcoding software, and transfer content on demand without requiring any manual steps. As a result, FLICS makes hybrid and cloud-based video content processing highly cost-effective, leaving the customer to decide which resources to use.

The FLICS solution is available for file-based transcoding use cases, adaptive bitrate encoding, and live recording and live transcoding applications. It features a wide range of image processing capabilities and filters, including optional plug-ins for automatic loudness management and high-quality motion-compensated frame rate conversion for live and file-based conversions.

Hiscale's powerful JOBS video workflow orchestration platform is a

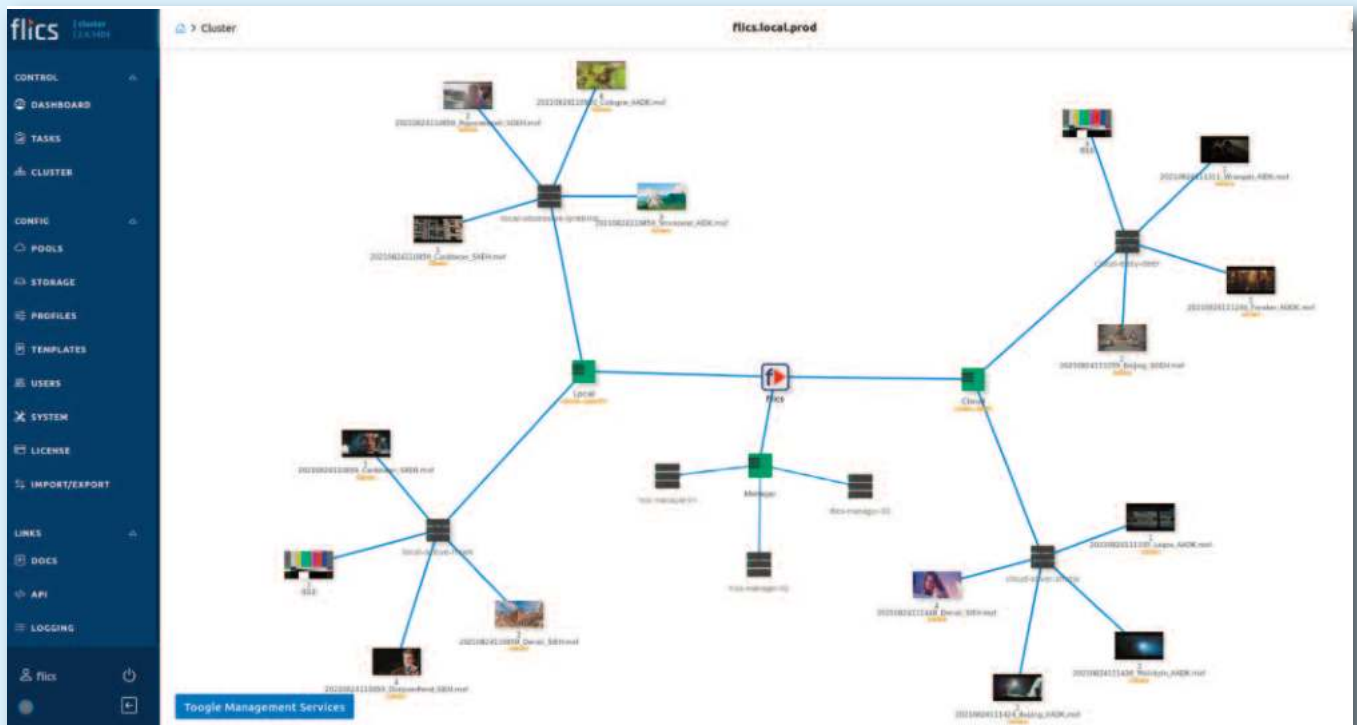


media file workflow engine designed to simplify and automate the complexities of multi-vendor integrated environments for ingest, quality control, distribution and cloud processing. It manages and integrates with broadcast environments and has a wide range of existing integrations to transcoding, QC and transfer solutions.

Workflow systems are widely used in the market and have been so complex and proprietary that making changes to existing configurations or integrating new systems into your process has been a major challenge and required a great deal of involvement from the product manufacturer. With JOBS and its toolbox approach, you can easily set

up your own workflows in a BPMN-based web-editor and make changes as you go. The powerful JOBS RESTful API, workflow scripting capabilities, command line integration options, and JOBS Plugin & Adapter SDKs, give our customers all the tools they need to build and extend their next-generation orchestration system. With its flexible architecture and customizable interfaces, JOBS is the ideal solution for future-proof workflow management of modern video supply chains.

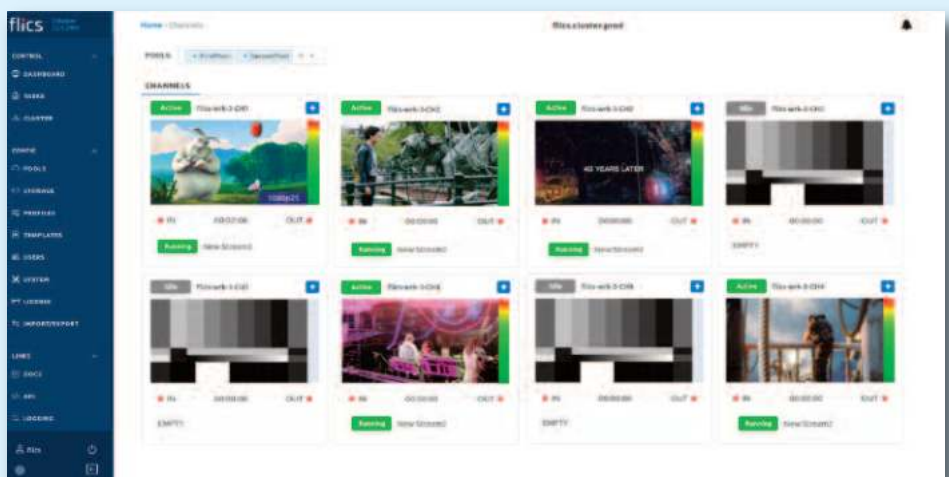
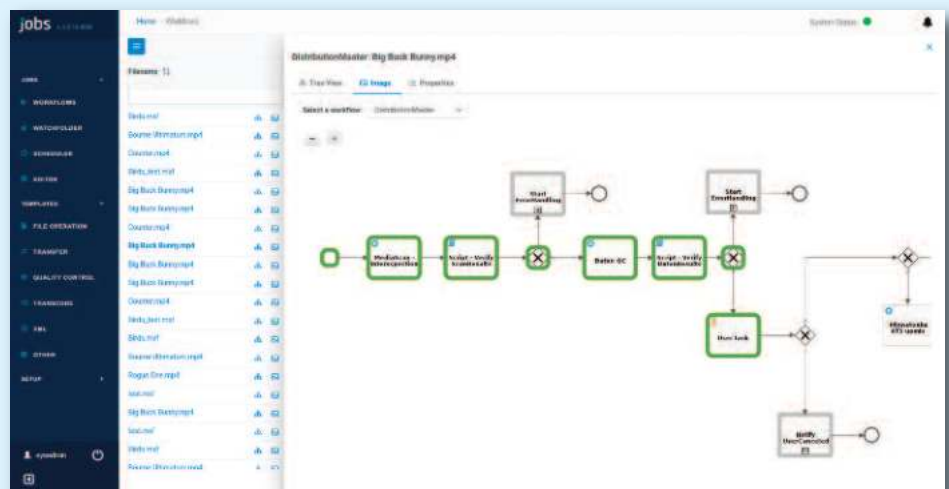
The latest product family, SHIFT, was developed to efficiently manage the transmission of live video signals over the public Internet and other networks using IP-based protocols. SHIFT offers outstanding



performance, highest quality (SD, HD, UHD) and easy control of live signal distribution with protocol switching and point-to-multipoint distribution: encrypted, lossless and low latency. By combining industry-proven streaming protocols with SRT video transport technology based on years of broadcasting and distribution experience, the SHIFT platform maximizes the efficiency of your content delivery in a cost-effective and scalable way.

Our team of highly skilled professionals, with years of experience in the broadcast and media industry, have developed the tools to make your day-to-day video streaming, transcoding, orchestration and live distribution business easy to manage, efficient and scalable!

For more information, visit www.hiscale.com



Hassan Ghoul

Hassan Ibrahim Ghoul

Oct 31 1953 – Oct 27 2021

We are very sad to report that Hassan Ghoul, IABM's Director MENA for a number of years, passed away in October this year.

Hassan was a hugely liked and respected figure in the broadcast industry both in the Middle East and around the world.



After gaining his Bachelor's degree in Electrical Engineering from the American University of Beirut in 1975, Hassan started his career as Systems Engineer within the IT Projects Department of COMSIP Enterprises in France. He then worked for more than five years in the Telecom Products Division of 3M Middle East before joining Sony Broadcast & Professional in February 1984 initially in Basingstoke in the UK then in the Middle East when he moved to Dubai in 1989. At Sony, Hassan occupied various senior positions in the Middle East & Africa regions for 21 years.

In 2005, Hassan established MediaNet, a Broadcast Consultancy company operating in the Broadcast, Satellite, Production and Post-Production markets in the MENA region. He also held senior positions at Ascent Media Group, Tevido

LLC, ATG Broadcast, Grass Valley, and most recently as Director for the Middle East and Africa at the IABM, and as Senior Partner at Master Media.

Hassan was also Vice Chairman of the Arab HDTV & Beyond Group and a member of the ASBU Media Training Academy's Consultative Council.

Hassan is survived by his wife Bassima, his two sons Ibrahim and Karim, and his four granddaughters Isla, Lara, Talia, and Tuleen.

Below we publish tributes to Hassan from fellow industry professionals and friends who worked with him throughout his distinguished career. I am indebted to Hasan R. Sayed Hasan of Master Media, a close friend of Hassan Ghoul, for the following background facts on Hassan's life and also for eliciting many of the tributes that follow.

Hasan R. Sayed Hasan, Managing Director, Master Media/ Chairman, Arab HDTV & Beyond Group

Hassan Ghoul's life is a magnificent model that we would like to be simulated and highlighted. He has established that the principles of kindness, respect, integrity, and maintaining the best human and personal relationships do not contradict at all with the ability to make very successful business deals and connections, in a classy way.

Hassan' never spoke about his remarkable achievements or success stories. I am very lucky to have been personally and professionally close to Hassan for many years, but I confess today that in the last few

weeks after Hassan left us, I have discovered that I knew little about his extensive accomplishments and the influence he had on the personal and professional lives of so many people around the world, and from all cultural and business backgrounds, and about the widespread impact of his genuine personality and deep ethical attitude as a business leader, professional, mentor, and friend. I believe no one better than Hassan El-Ghoul incorporates the personal and business ethics that we should aspire to lead our personal and professional relationships.

Those who knew Hassan will know what a generous and gentle person and Family Man he was. On behalf of all of

us in the regional and global broadcasting community, I would like to send our sincere condolences to Hassan's family, especially to his wife Bassima, his two sons Ibrahim and Karim, and his four granddaughters Isla, Lara, Talia, and Tuleen.

May your soul rest in peace my friend, the Real Gentleman.

Peter White, CEO, IABM

We were greatly saddened to hear the news of Hassan Ghoul's passing; we have known Hassan for a long time and enjoyed working with him for many years. He was a member of the IABM team for some time and we all liked and respected him greatly. IABM and the industry has lost another brilliant colleague far too early. Hassan was an expert in the region and a hugely knowledgeable man and will always be remembered by all at IABM and I am sure in the industry as a whole for his generosity of spirit, innate understanding and his great sense of humour. Hassan was a great man with a kind and gentle nature: a true gentleman. We will miss him and never forget him. On behalf of everyone at IABM, I offer our sincere condolences to Hassan's family and friends.

Abdul Rahim Suleiman

Director General, Arab States Broadcasting Union

Days have passed and we yet, we are still under the painful news of the passing away of our dearest friend and colleague, engineer Hassan El Ghoul. I cannot evoke the overall growth of the technological development achieved by ASBU without mentioning the exceptional contribution of Hassan Al Ghoul in practically all the stages of this evolution and this transformation. Indeed, I could say that Hassan was part of all the steps marked by the important challenges that our union had to take up.

I will start by mentioning the technical equipping of the Arab news and Program Satellite Exchange Center that ASBU launched in 1987 and the fruitful cooperation successfully carried out by Hassan El Ghoul in this area when starting his career with Sony. He accompanied ASBU in its major projects for the design and the implementation of our multiple ventures as well as providing professional consultancy services, to help us shape strategic views of media technology innovations aiming at making media technology and related developments accessible to ASBU public broadcasters members.

Hassan was a visionary and he had, throughout his various positions in the broadcast media technology

industry, a direct focus on building long-term relationships and partnerships.

Top professional broadcast industry groups in which Hassan had been working for over thirty years in the MENA region agree to say that he had been a great addition to them. During his lifetime, all those who knew him were also full of praise for his human qualities. Today all are unanimous to describe him as a caring and a charismatic gentleman with deep ethical values respecting and considering others and inspiring them.

We were deeply privileged having Engineer Hassan El Ghoul involved from the start of the process for the setting up of a high level ASBU training academy and its launching on 29th April 2017. Furthermore, we have been very honored to have him Member of the ASBU Training Academy Consultative Council since its inception and he greatly contributed to the development of the Academy, becoming a regional reference in the audiovisual arena.

Engineer Hassan El Ghoul was present with us on 21st June 2021, participating at our ASBU Academy Consultative Council meeting, held online.

We will miss him.

May his soul rest in peace.

Dr. Riyadh Najm

Former Deputy Minister for Information Affairs and President of the General Commission for AudioVisual Media, Saudi Arabia

I have known Engineer Hassan for more than 20 years, since he was working with Sony. He combined a high level of respectful personal relation with his clients along with mastering his field of expertise. I don't remember that I have ever strong arguments with him regarding a product or service he was trying to sell my Organization. He was always keen to reach out and help. Will always remember Eng. Hassan as a friend with high dignity and elegant character.

Francoise Semin

Former colleague at Grass Valley

Hassan. I had the privilege of working with you during a couple of years, when you accepted to join my team to manage the Middle East business for GV.

This time left me with the fondest memory of you as a great professional as well as a very beautiful person.

I have always seen you so well-disposed, with a great sense of responsibility, integrity, humanity, and kindness, paying great respect to everybody, your customers, your partners, your colleagues.

You definitively marked the media broadcast industry, that you served with passion and dedication. You will remain in my heart and my mind.

Tom Canavan

Former colleague at Ascent Media Group

There have been thousands of people that I've come across in my career so far; hundreds that have been colleagues; much less that have stood out as exceptional, and even less that I have called "friends". Hassan is one of both. An incomparable professional who has made our industry a better place, he was a kind, gentle man who forever had a smile and was an absolute pleasure to be with. I will always cherish the fond memories of my first trip to the UAE where Hassan gave me his "crash course" on culture, geography, and, of course, local business customs. I was trying to reach him after a long while just days before his passing. If only I had tried a bit sooner...

RIP my friend.

Richard Scott, Sony

I first met Hassan during my role at Sony Broadcast in the UK in the early 90s. He was head of Broadcast sales for Sony in the Middle East while I was in a similar role for Sony in the UK. I was a relative "newbie" to the Sony team and I recall the huge respect which everyone had for Hassan inside Sony because at that time, sales of VTRs (mainly BetacamSP and Digital Betacam at that time) and sales of high value and complex studios and playout centre projects through the Systems Integration Division were one of the main indicators of success. Hassan's achievements in both areas were already legendary within the company. When I moved roles to work in the Systems Integration Division a few years later, Hassan was one of the first people who made a special effort to reach out and to help me understand what the sales team needed to be successful in the region and to continue to leverage Sony's capabilities in major projects and solutions.

The "obvious" mission was to sell the large range of Sony products along with complementary products from other suppliers as a total solution, but the real underlying message to me from Hassan was about building trust and about putting in "face time" with customers; "people buy from people, not companies" he once said to me. It was in these years where Hassan made the huge impression on me and we

developed our friendship. We visited countless customers across the region together and during that time, Hassan introduced me and others to a large number of major customers, often at the most senior levels and this was the origin of many long standing friendships and relationships across the region. Watching Hassan connect with people and build trusted relationships at the most senior levels was like a masterclass in executive level account management and something I later tried to encourage and emulate throughout my career.

The reason I like to share this background is because I regarded Hassan as someone who educated me in so many ways. He not only introduced me to the many facets of life and business in the many different cultures and countries across the Middle East region, but he also demonstrated the power of building multicultural customer-facing teams. These routinely involved colleagues from Japan, Europe and the Middle East region working closely to solve problems and to build the level of confidence customers needed to place their trust in the team and brand.

Later on the mid 2000s we had a new opportunity to work together again, this time for Ascent Media's European systems integration business. The value of Hassan's personal reputation in the region became obvious to my American colleagues who were initially cautious about growing the business in the region but soon realised that with the right person representing and advising the company, there were huge opportunities to do well. Hassan's skills with bridging the gap across cultures now extended to many new colleagues and friends in the USA, who benefitted in the same way as I did with many new introductions and lasting friendships across the region. His reputation became the ideal platform for his success in later years working with various manufacturers and most recently with the IABM.

Aside from the very positive legacy in business for which Hassan will be remembered, I wanted to end my note with something about Hassan the person. To help me with this, I asked my wife to sum up what she remembers about Hassan, she used the words "Charismatic", "Gentleman" and "always smiling". I couldn't have put it better myself.

RIP Hassan



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