



Sustainability

Looking at every aspect of what companies do – and how they do it – to dramatically reduce environmental footprints.

Also Featuring :-

Business Agility

**Manage and Publish segments
of the BaM Content Chain®**

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All stops out for a successful IBC2022!



Peter White
CEO, IABM

Welcome to the IBC2022 edition of the IABM Journal. Our major themes for this issue are Business Agility, Sustainability and the Manage & Publish segments of the BaM Content Chain®. We have had an incredible response to our request to members for articles around these three subjects: more than 60 have contributed, making this by far the biggest edition of Journal ever.

All the articles will also be published standalone on the Knowledge Hub over the coming weeks, adding to the incredible fund of knowledge we have to offer the industry; whatever business angle or technology a media or broadcast company is exploring, they can find an array of relevant, up-to-date content on the Knowledge Hub. With other traditional media outlets diminishing, the Knowledge Hub has become the industry's go-to place for information.

As I write this, we are making our final preparations for what looks set to be a very vibrant IBC Show. Checking the IBC website, there are more than 1000 exhibiting companies listed – many of whom are IABM members of course. In line with – or perhaps now ahead of – other returning shows this year, visitor attendance looks set to exceed even the most optimistic expectations from just three months ago. It's going to be a great show, and IABM will be playing a central role in helping all our members get the very most out of it.

This year for the first time, our show-opening Industry Trends session is open to all conference attendees (as well, of course, as IABM members). Our Business Intelligence Unit has created a fantastic State of the

Industry Special Report to underpin it. This will be a 'must read' for everyone in the industry and will go live on the IABM website on the first day of IBC. IABM members can book for the Industry Trends session here. Just a reminder that you will need to have collected your badge before coming to the session – they won't be able to issue them at the door.

We are also running the BaM Live™ Stage continuously over the four days of the show outside Hall 8 (8.F54). We have a packed program of presentations covering all the major industry themes – Transformation, Convergence, Resilience and Future Trends – with case studies jointly delivered by IABM members and their customers. You can review all the individual sessions here.

Our member lounges are a much-used feature at major shows and for IBC we've again retained the whole of Level 2 above what used to be Hall 4 for our IBC BaM Zone™ Member Lounge. It includes a large space with comfortable seating and tables away from the bustle of the show floor as well as pre-bookable meeting rooms. The BaM Zone™ is also home to the IABM TV Studio which will be running a full schedule of interviews and round tables throughout the show. The BaM Zone™ Member Lounge is open to all

members and their guests throughout show opening hours.

Don't forget to register for our IABM members drinks reception, which is taking place at 6pm in the BaM Zone™ Member Lounge on Saturday 10 September for 90 minutes of networking and a chance to compare notes halfway through the show before heading out for evening engagements. Complimentary refreshments will be provided.

For those members not attending the show, we will be recording the Industry Trends sessions and all the presentations on the BaM Live™ Stage to make them available on catch-up after the show. And don't forget the Special Report, which will go live on the MediaTech Intelligence section of the website on 9 September.

I look forward to catching up with you all at the show. I wish you a successful – and enjoyable – event. It's going to be great to meet up in person again at last!

Peter White
CEO, IABM

Vimond

Imprisoned by Current Streaming S

Opinion

Suppliers?...

...the escape may not be as hard as you think

When will lock-in end?

In the media world, it's sometimes hard to see a way out, or even a way forward, or to get even a sniff of change, when you have been running mission critical services for years with one supplier. This is as relevant for OTT services as it is for any other business. Broadcasters and content providers have built up audiences and viewership over years, developing complex ecosystems of infrastructure as technology has evolved.



Craig Bird
Vimond

The great user experience, the high-quality streamed video, personalisation, recommendation engines, ad integrations and other services are dependent on a series of integrations, customisations, in-house code and often legacy development from software engineers who have long since migrated on to pastures new.

The age-old joke about comments in the code that say 'don't remove this line, we don't know what it does, but the whole system comes down without it' often has a ring of truth. When a software infrastructure and ecosystem has grown over a period of ten, fifteen (or even longer!) years, there are hidden routines and forgotten integrations, whole moving pieces for which nobody can remember what they do or why they are

there... (Trust me, I have spoken to some of these companies).

This situation can cause many problems. From the fear of changes causing downtime, to an inability to try new technologies, new integrations, and new suppliers leading to stagnation in development. Stagnation is not what you need in a fast-growing market where the competition is getting fiercer by the day. We don't need to suffer this in addition to the Content Wars. ([More on that in our '10 tips on how to become \(or stay\) successful as a streaming service today' think piece](#)).

It means that we can start to feel trapped with our current situation, or stuck with our existing supplier. Replacement of a CMS for OTT is often seen as a mammoth

Just because one part of the infrastructure and ecosystem could use a refresh, it doesn't mean that the rest has to have one too

undertaking, requiring a rip and replace of an enormous part of your infrastructure and ecosystem.

When your OTT Service relies on a Video CMS or OVP that is as critical a component to viewer facing services as the heart, brain or nervous system is to the human body, it can be tempting to accept your lot and resign yourself to the status quo: 'If it's not broken, don't fix it'. That is a difficult adage to live with when you need to stay at the forefront of technology and innovation by leveraging the most effective of services and suppliers in order to compete, win, retain and maintain audiences, with an ever reducing workforce (because everyone is under pressure to do more with less). In addition, you need to put in an effort to increase revenue per viewer by driving engagement, helping audiences find content quicker than ever before and

stay ahead of the competition. That is a hard situation to be in, when much of what you have is many years old technology, and the world is changing around you.

While early OTT services began based on on-premise servers in broadcasters' own data centres, some have virtualised legacy workflows and components into the cloud.

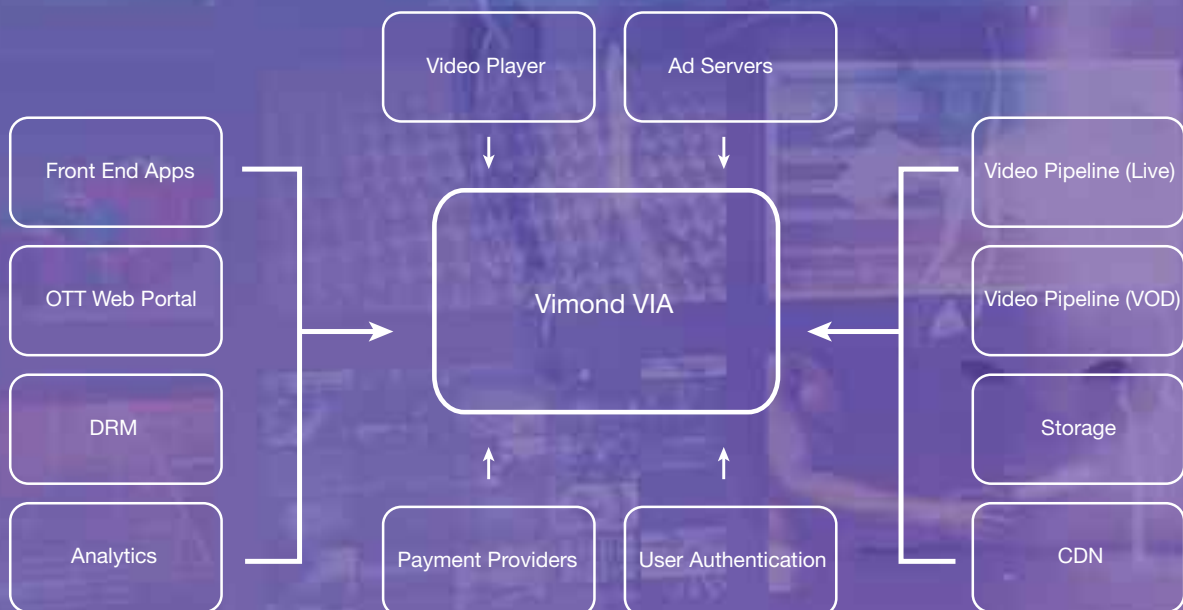
Many end up tied-in, locked-down or stuck with one supplier at the core of their services, and some of the less scrupulous providers know it, using this knowledge to drive up prices year on year.

What compounds this unfortunate situation, is that the smart little upstarts and new market entrants

are starting off on cloud native technologies, which gives them a distinct edge over lurking or lumbering behemoth giants of ecosystems that have grown so much over the years that they are now perceived as weak at the knees, with the possibility of relatively small changes bringing a collapse into black screens for viewers and frustrated audiences.

But it doesn't have to be that way. The rip and replace of critical components does not have to risk the arterial flow of video entertainment to viewer screens. Just because one part of the infrastructure and ecosystem could use a refresh, it doesn't mean that the rest has to have one too.

Vimond has been through some of these journeys. We have seen, and shared some of this pain with customers, old and new. Vimond has been through a modernisation



journey that some are struggling to get started on, or failing to make progress on. Vimond VIA is a mature, stable, cheeky little upstart of a cloud-native OVP or Video CMS. Vimond brings you the best of both worlds, longevity and youth, all in one go: The wisdom of age combined with the springy elasticity and bounce of youth.

The Vimond VIA OTT platform, and the Vimond experts can help with your journey. There are several different approaches:

- For companies setting up a new digital OTT service for viewers, you can launch the new service on Vimond VIA, without risking any existing channels or audiences.
- For companies hoping to replace a long-standing CMS system, you can start to migrate to Vimond with the minimum of changes to the overall solution or ecosystem that you have.

Why might this be easier than you might think?

Simple: Vimond VIA is a cloud-native, automatically scaling CMS designed to facilitate the smooth running of OTT services ([don't take my word for it, check out our think piece 'automatic scaling, what on earth is that supposed to mean?'.](#))

Vimond VIA is flexible, scalable, modular, and has APIs available for more functions than you can shake a stick at.

Vimond will not demand that you move or migrate your video assets or video pipeline. Vimond VIA does not require all your video to be imported into the system.

Vimond VIA does not care where your media is, or which cloud provider (or premise) video is stored on.

Vimond will not insist that you change your authentication provider, your DRM or your apps partner.

The flexibility of Vimond VIA means that you can continue to use huge parts of your existing ecosystem or infrastructure, such as ad partners, video pipeline and

transcoding partners, payment providers, video players, DRM providers, CDN, analytics.

These are all pieces of the puzzle that you might not want to move straight away, instead you can integrate them as is, and start trialling the power of Vimond VIA with a smaller project, piece by piece, (for instance by enabling the editorial team to manage and curate content – this is where the core strength of Vimond's user-facing applications lie).

The other pieces you can move later, or not at all, if that is to your liking. Vimond VIA can help you from afar – a different cloud provider, a different country, and you'll never know that we are not right next door. This is a low risk approach to avoiding a big bang, starting with a new service, or just one service, and migrating over time, with the maximum of ease and the minimum of disruption.

Vimond have been in this game for a long time, with customers gained through reputation, rather than the weight of an enormous marketing budget. We prefer the personal approach and we are one of the longest running and strongest providers in this marketplace. You wouldn't be the first provider to switch out one of the big-name suppliers, for some of the brightest minds currently working on OTT and IPTV, headquartered in Norway.

We help our customers to succeed, by being a company that does what we do, very well – working with broadcasters and content providers to create world class entertainment services.



How the software revolution is changing the media industry

Much has been written recently about the transformational shift in the media industry. Until recently, the only way to get the performance level we need – a new picture every 40ms – was to build special purpose hardware. Now, thanks to Moore's Law, we can do pretty much everything we need on the same workstation hardware that banks and airlines and insurance companies use.



Managing our industry



Heiner Lesaar
CTO, ELEMENTS

While we all celebrated about the way that this means technology is much more affordable, thereby democratising creativity and unleashing the potential for much more media on many more platforms, we must also acknowledge that it means a big change for the business models of vendor companies.

I see a lot of implications in this, but I want to talk about two in this article.

The first is the change in our supply chain, and perhaps even the fresh need for supply chain management. When broadcast products, whatever they were, ran on bespoke hardware designed by the vendors and either manufactured in house or by a sub-contractor, the skill was in forecasting how many of each unit to build each period.

Now we offer software products. These are largely self-developed because vendors in our industry are the subject specialists, but many will also include third-party software where the functionality is pretty standard.

Typically, the developers of these third-party packages, which might be databases, or file acceleration, or some other sub-system, will be dealing with multiple industries and may well regard the broadcast and media business as small and relatively insignificant. They almost certainly will not be swayed by our deadlines: they will probably not even have heard of IBC, let alone understand why it is so very important you can demonstrate your new release – which depends on the third-party new release. Managing the supply chain becomes a matter of managing expectations, both internally and with the end user.

The software has to run on standard hardware, and this is where the challenges can become even greater. Again, the difficulty is that the supply industry is dealing with huge numbers of sales of which our requirements are a tiny part. When supplies are short – and we are all aware of the component issues at the moment – then as a small cog in the IT gearbox we may be at the back of the queue.

Sometimes there are entirely unpredicted challenges. During the pandemic, for instance, there was a boom in crypto-currencies. We could discuss the reasons for this, but it would get us nowhere.

The effect of this crypto boom was a huge shortage of GPUs and hard drives, and a consequent big price rise. Our business is in large storage networks so we need a lot of drives, and this was a problem for us.

As a relatively small business, though, we can avoid bureaucracy in our purchasing, and if necessary we can work the phones to get what we need. If the CPUs or drives are not

available here in Germany, then we can see what we could get in the UK or in Asia.

We are also able to talk to our customers, so they can help us help them. For example, one of our preferred network switches is from Arista, and at the moment they are quoting as much as 40 weeks for delivery for the right model.

By staying close to our customers, we can talk them through the situation. They may be able to find suitable switches on the second-hand market, and we can work with them to certify any potential purchases, and quickly amend our contracts to reflect the fact that they have sourced the router.

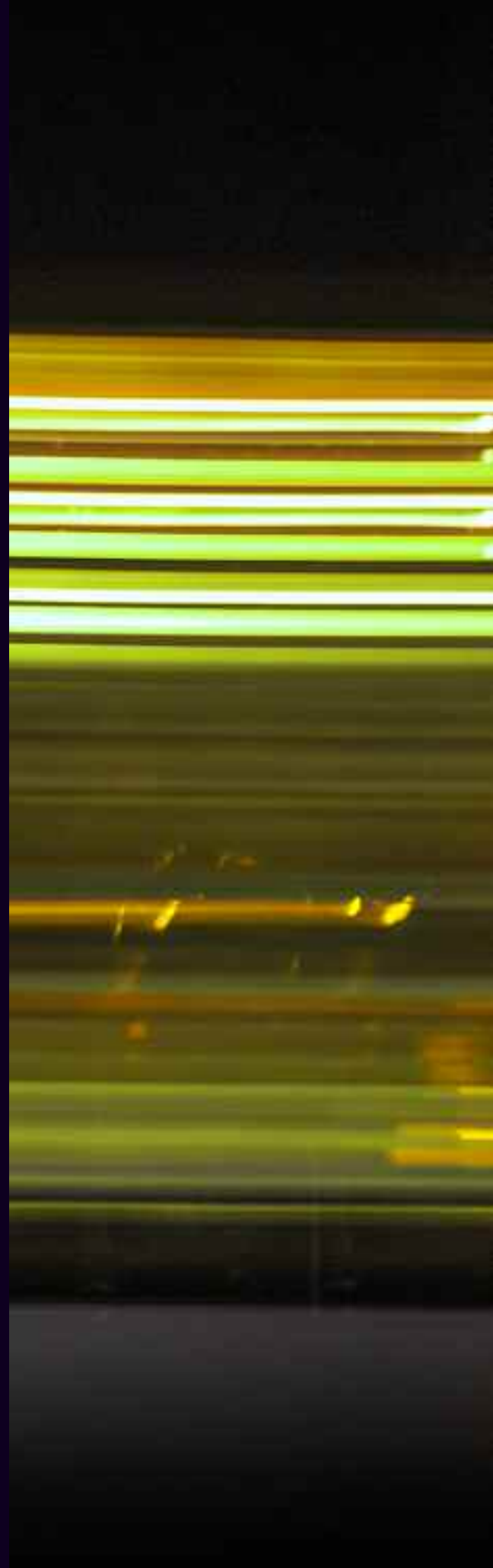
The ultimate goal is always to deliver on the end user's requirements, but to do that we have to be flexible, and develop new business skills and principles.

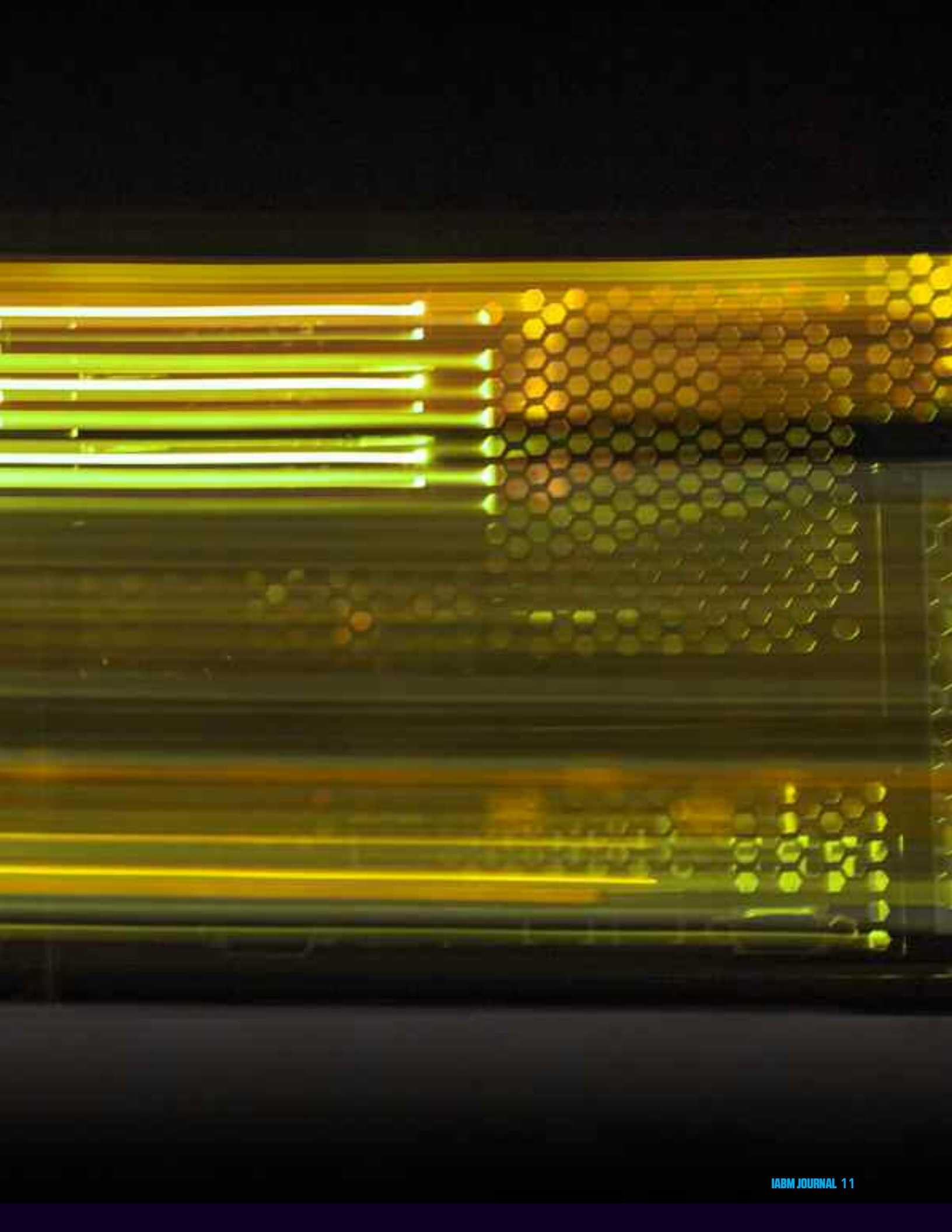
My second point, and this is a great concern to me, is that, in what is now a software industry, it is becoming very hard to find talented developers and support engineers. This is an issue across the whole of the software industry and we are competing for skills. But the media sector is not helping itself: it must do more to attract talent.

I do not see this as being about money. It is a struggle for many businesses in our industry to find the right people. At ELEMENTS, we have recently opened a technology department in Belgrade, Serbia. It was a territory where we could readily identify suitable candidates, even though we have to train them ourselves in the specific requirements of the media industry.

As far back as 2014, the IABM held a conference on the industry's skills shortages, and particularly the need to turn young people on to the excitement and potential of our industry. According to the official report of the conference, a leading broadcaster told the delegates "We have to go and face them with our challenges. Show them that we have real engineering issues. There is development to do and it is not a standardised development, so you can put your skills and talent into real projects."

Successful businesses understand the importance of human capital. We have to find ways to attract and retain the best software talent. Is now the time for companies across the media industry to join forces and create an academy? We certainly see that there is room for that, and such an initiative would win our support.





Sustainability



Sustainability

Our only home is under threat; what is our industry doing to protect our beautiful but fragile planet?

Judging by the range of the articles included in this section, our industry really is taking the threat to the planet seriously, with end-users and stakeholders increasingly prioritizing environmental concerns in their purchasing decisions as well as operations, and media technology suppliers not only ensuring they meet these requirements but also looking at every aspect of what they do – and how they do it – to dramatically reduce their environmental footprint. We're nowhere near there yet, but all the movement is clearly in the right direction and rapidly gaining momentum.

Amino

The sustainability vs. profitability debate



Today's business leaders are coming to the conclusion that profitability and sustainability are not mutually exclusive. In fact, creating strategies on environmental, social, and corporate governance (ESG) programs has been gaining significant momentum for companies that are looking beyond the traditional bottom line to measure their impact. Yet, balancing thin profit margins with long-term sustainability goals and regulatory compliance requires sound principles, a well thought-out plan, and strong leadership to achieve optimal shareholder and stakeholder value required to succeed.



Jonny McKee
VP of Product
Management & Customer
Support, Amino

Of course, there are many reports that draw a direct correlation between sustainable practices, share prices, and business performance. Just follow the money. According to a 2021 global survey by FTSE Russell, an index provider, sustainable investment is now standard globally [where 84% of asset owners are either implementing or evaluating sustainability into their portfolios](#). Analysis by BlackRock, the world's biggest asset management company, found that in 2020 [more than eight out of 10 sustainable investment funds performed better than share portfolios not based on ESG criteria](#).

If protecting the environment and investing in employees weren't enough, this market validation is a major motivator to unite financial outcomes with sustainability ones. The strategy shifts sustainability from a 'nice to have' to an essential corporate imperative.

Based on experience gained at Amino, we've outlined some core areas that focus on sustainability goals – without sacrificing quality or profits.

1. Create a circular supply chain

The circular economy model is gaining lots of attention because it is designed to reduce companies' environmental footprint and operational waste, while leveraging resources efficiently. Essentially it means businesses create supply chains that recover or recycle the resources used to create their products. It is a supply chain that is sustainable – and traceable – at every stage.

There are many details to be considered, including use of recycled plastic or paper instead of plastic, type of glue being used, transport methods. Which suppliers are willing to be audited for compliance? If they are part of a conglomerate, will the parent company also be willing to be audited? And are they as committed to sustainable manufacturing processes?

The use of recycled plastics for devices and accessories is an obvious step in the road to sustainability. However, to do this and retain high quality standards requires considerable effort and expertise. For example, when manufacturing electronics, careful control of the raw materials is required to ensure that the finished product meets all relevant standards, such as the safety and flammability standards of plastic material for parts in devices, which dictate the use of fire-retardant materials. This requires the manufacturer to not only use recycled materials but also ensure that they are traceable and for the composition of those materials to be known, so that the finished product meets all relevant safety standards.

To reach a high percentage of recycled materials in the device it is essential to use recycled materials for all surfaces rather than just those in the chassis that are unseen by the consumer. That dictates that a high-quality surface finish can be achieved while using recycled materials where consistency of the source plastics is not as high as with virgin material. This does not need to be a compromise, but rather a case of understanding your materials and their capabilities.



Packaging should be as small as possible. Increase the amount of recycled and recyclable packaging while reducing the number of paper inserts in each box. Rather than print set-up and user guides, only include the safety details necessary to comply with regional regulatory requirements. The safety leaflet can include a QR code and URL indicating where relevant collaterals can be found online. Even with printed materials, plant-based inks and glues can be used rather than the petrochemical-based alternative commonly used.

Take for instance a set-top box package. It typically includes related items like cables. Cables are traditionally wrapped in plastic bags which while recyclable, may not be easily recycled by consumers and often end up in landfills. Other options include biodegradable plastic bags and paper 'ties' to secure the cables.

At Amino we have found that the use of recycled packaging adds approximately 8% to our packaging cost. However, as technology improves and becomes more widely adopted, we believe this will decrease.

2. Commit to energy efficiency

An area of ongoing focus is energy. Power consumption is tightly tied to carbon emission. One kilowatt hour produces approximately one pound of carbon dioxide. There are many statistics flying around about the true impact of video streaming on carbon emissions as the growth in internet traffic has surged the last few years. Nonetheless there are improvements to be made.

One effort to help reduce the streaming carbon footprint is the Voluntary Industry Agreement with a mission to improve the energy consumption of Complex Set Top Boxes within the EU. The primary objective of the Voluntary Agreement is to continue improvements in the energy efficiency of set-tops without jeopardizing their intended uses and functionalities. This underscores the trade-offs between reducing power consumption and consumer experience. Achieving the lowest stamp of power ratings means many peripherals on the CPE will also need to power down. The effect means that coming out of standby might take longer, which we believe is a compromise most consumers will accept because of the environmental benefit.

This then becomes a consumer education issue to communicate the environmental benefits of waiting a few more seconds to power up, which can have its own pay-off by building brand loyalty with environmentally conscious consumers.

3. Reject planned obsolescence in favor of upcycling

One of the most infamous examples of planned obsolescence comes from Apple. In 2018, the company was found guilty, and subsequently admitted, to the fact that older iPhone models were slowed down through iOS updates. They were ordered to pay a hefty fine and, it can be argued, their reputation was damaged in the process.

In a pay TV example, the operator business model is to provide a service to the consumer. It is therefore important that every aspect of service is considered for the entire lifespan of a subscription. From the point that the consumer subscribes to the service and receives hardware through to and including replacement of a device years later is important.

The point is to prevent obsolescence – planned or not. Software should extend the life of a device to avoid costly hardware replacements. Device 'upcycle programs' allow operators to radically overhaul the software and services deployed in a customer's home without any changes or upgrades to the consumer's hardware – and keep devices in use rather than in landfills. Think of the environmental effects of remotely updating firmware and apps, as well as helping customer service agents resolve support issues without sending a technician, in a truck, to the consumer home.

Summary

There is an incredible opportunity for industry leaders to shape a profitable future for their businesses by adopting sound principles of sustainability into their overall strategy. Going further, integrating sustainability into the corporate culture can have profound effects in other areas of the business including [job satisfaction of employees](#), [the strength of customer relations](#), or even [the effectiveness of a company's board](#). A focus on sustainability can have a knock-on effect to help companies be more resilient during market downturns.

While it's not always easy being green, the effort has undeniable potential to help people, the planet – and yes, profits.

Learn more about Amino's [Upcycling Program here](#), and download the company's [latest ESG report](#).

Ateme

The world is under threat, but what is our industry doing to protect our fragile ecosystems?

The recent extreme weather has shown us that climate change appears to have arrived in force. The human cost is already extremely worrying – last year, for example, over 180 people perished in floods in Germany and Belgium, while over 500 people died in a heat wave in British Columbia, Canada alone. And this year, Europe has seen its worst drought in 500 years, with two-thirds of the continent ‘under distress’.

In addition, one of the most concerning climate change tipping points has also sadly been reached, with a section of the Amazon forest now producing more carbon dioxide than it is able to absorb.



Rémi Beaudouin
Chief Strategy
Officer, Ateme

There can now be no doubt that a massive collective effort is necessary to slow down climate change, and it will require teamwork across every stakeholder group, with businesses having a massive part to play.

Focusing on the video streaming niche, for instance, reveals some important insight that requires urgent and decisive action. According to research by Emma Stewart, Ph.D, Sustainability Officer at Netflix, for example, in 2020, one hour of Netflix streaming was equal to driving a gas-powered passenger car a quarter mile (or 400 meters).

Given the scale of Netflix and the other streaming services around the world, this equates to significant levels of energy consumption. Assuming that around 20 million customers were to watch a service like Netflix for an average of two hours each day, the environmental impact is equivalent to driving over 37 billion passenger miles.

Part of the challenge also lies in the arrival of new, energy-hungry technologies, such as blockchain and artificial intelligence. As these find more use cases across the streaming industry, they will put our collective environmental performance under even greater scrutiny and pressure. Positive change must rise up the list of priorities for organizations across our sector if we are to play a full role in protecting the future of the planet.

Investing in better environmental performance

But how can streaming service providers act on these priorities and contribute to reducing climate change while still providing a top-notch viewing experience?

From Ateme’s perspective, we are concerned about video delivery’s global warming contribution as viewers are increasingly shifting to more resource-hungry options. This shift is driven especially by a demand for interactivity and personalization.

Our TITAN and NEA delivery solutions, for example, have reduced the energy consumption of streaming video delivery for a wide selection of customers across the industry. Specifically, improvements in their performance over three years resulted last year in a two-third decrease in energy consumption for OTT delivery compared to the average consumption in 2018.

Moreover, Ateme remains a committed and active player in the pursuit of better environmental and energy performance. Initiatives such as ‘Greening of Streaming’ are offering a new sustainable association, and as a founding member, Ateme is working with other organizations in the streaming industry to share best practices and drive greater energy efficiency across the sector.

The technology challenges – and opportunities – are diverse. For example, with more video being consumed



online, there is also a need for new codecs offering better compression to address ever-growing bandwidth requirements. This will deliver a range of wider benefits by reducing VOD storage requirements, a capability that cascades to reducing cache storage requirements in CDN distribution.

Ateme continues to invest in delivering advances in encoding that have allowed service providers to consistently achieve the highest levels of video quality at the lowest bitrates. This represents just one of many ways in which Ateme aims to play a leadership role in helping our industry meet its obligations to future generations.

This includes leveraging advances in microprocessor technologies, accelerating the use of distributed parallel processing, and implementing cloud-native microservices (among many other initiatives) to limit the impact of video service providers on the environment. What's more, energy savings also contribute to a stronger bottom line, both by reducing consumption of encoding resources and by reducing bitrate contributing to lower storage costs and greater bandwidth efficiency.

Ultimately, going green is not just about acting on a collective sense of environmental concern and social obligation; it is by far the best business strategy both now and for the future.

iSIZE Technologies

Finding innovative approaches to sustainable video delivery

The billions of streaming users around the world get their content from a mere handful of large streaming service providers, each in turn accounting for more bits per second than any other type of internet usage. More than a billion hours of content is consumed on a single streaming platform every single day. Netflix recently claimed that a single hour of streaming a film or drama has the equivalent CO2 emissions as charging 12 smartphones; when you consider that the average American spends nearly 12 hours a day streaming some form of media, that soon mounts up.



Sergio Grce
CEO, iSIZE
Technologies

The media & entertainment industry is facing an urgent need to reduce its environmental impact, and many of the biggest brands have set ambitious goals of achieving net zero by the end of 2022. In parallel with this mammoth task, the industry must ensure there is no compromising on the impeccable quality and end user experience that today's audiences demand.

What is needed are truly innovative approaches that are readily available and scalable today, alongside the development of next-generation technologies to ensure that quality and efficiency are continually pushed to new limits.

Looking beyond video compression

The electricity usage for data centres, data transmission and devices, and then on the CO₂ emissions associated with each unit of electricity generation, are how we measure and track the carbon footprint of the streaming industry. To reduce the risk of rising energy use and emissions, investments in efficient next-generation computing and communications technologies are needed, alongside continued efforts to decarbonise the electricity supply.

iSIZE believes we need innovative approaches for a brave new world that look beyond the use of standard video compression algorithms. AI-based

pre-processing prior to encoding makes the ingested content easier, and more efficient, to encode – this is where we see the biggest gains being made.

The aim of new approaches to video delivery, such as iSIZE's, is to bring together psychovisual approaches and artificial intelligence to remove video information that is known to be imperceptible by viewers while reaching outstanding compression levels by standard MPEG or AOMedia encoders.

Not all pixels are created equal. With an understanding of how people perceive video content, it becomes possible to remove unnecessary detail in the input video content that incurs significant bitrate overhead in typical video encoders.

The end user experience is a major point of differentiation, so it is vital that the above process creates zero impairment to the visual quality – whether we are sharing videos for family contact or for business, we do not want them to look blurry/noisy or cartoon-like. This is where quantifying visual distortion becomes critical, and it is here that AI and deep psychovisual pre-processing become a gamechanger.

Leveraging neural networks for this type of video pre-processing is ideally suited to GPU



operations; computations can be run in a massively parallel architecture. On a small scale it could run on a typical PC or mobile phone, since all such devices now have increased GPU or NPU (neural processing unit) capabilities. Broadcasters and content providers could also use cloud processing to deliver at scale and at resolutions up to Ultra HD. Any processing overhead is more than counterbalanced by the reduction in encoding complexity as well as a significant decrease in the bandwidth requirements for the compressed video.

Removing complexity with AI

An AI engine learns to distinguish perceptually unnoticeable details in the content in an autonomous manner and without requiring any input from the encoder. The result is an increase in the compression efficiency of AVC, HEVC, VP9 and AV1 between 12% to 50% (depending on the use case), as validated by extensive commercial tests and human mean opinion scores obtained with standard protocols like ITU-T P.910 tests.

The other key factor in successfully implementing such technology is to ensure 100% standard compliance and cross-standard/cross-codec applicability; this removes reliance on any standard

or format and can be applied to any application, platform, or workflow that must move video data quickly and efficiently. The result is seamless integration without breaking any video coding or streaming standards.

Avoiding additional compute complexity in already complicated workflows is a key issue for many customers. Solutions that increase the efficiency and performance of all the latest codec standards including AVC/H.264, HEVC/H.265, and VP9 typically add significant compute complexity at the same time. iSIZE's codec-independence and fast execution means the capability to reduce video delivery system bitrate requirements without adding significant complexity. Our approach eliminates the need to wait for new codec standards to be developed and widely adopted – a lengthy process in an industry that is moving at pace.

At iSIZE our belief is that sustainability and greater efficiency for seamless end-user experiences are not mutually exclusive. We are also proponents of implementing standards-based solutions, that are available today, and can begin to reduce the environmental impact of video streaming immediately.

Synamedia's Quortex

If your streaming video arrives cold, it's time for a new oven

Have you ever thought of delivering streaming video content in the same way your local pizza shop prepares its orders? They make it fresh, on-demand and just-in-time. Not only is it more efficient but it also reduces energy and waste. Plus, who wants to eat cold pizza?

With streaming video, the same efficiency benefits as pizza delivery apply alongside huge sustainability advantages.

All it requires is a completely new way of architecting video delivery. No big deal.



Marc Baillavoine
CEO,
Synamedia's
Quortex

What is just-in-time (video) delivery?

82% of all Internet traffic is predicted to be consumed by online videos including live and on-demand streaming services in 2022, according to Cisco's Visual Network Indicator. However, in some cases, streaming video can have a higher carbon footprint than linear delivery due to its unicast nature. A modern and highly efficient video delivery mechanism, such as just-in-time delivery, becomes critically important to deliver the best ROI and set a sustainable future with a lowered carbon footprint.

When video delivery via the Internet was first implemented, its technology requirements were assumed to be the same as those required for traditional pay-TV delivery. What has become more apparent over the decades is that user expectations vary depending on the content they're viewing and devices they're viewing it on. Internet-delivered video simply shouldn't be transported in a one-size fits all approach the way traditional pay-TV would be. Adjustments that are made with viewer experiences in mind would unlock savings across multiple areas, including infrastructure and energy consumption.

How can this be addressed? The answer is that the traditional push model of video being processed and transported to sit in the CDN until one day someone might request the content must be completely updated. There must be a just-in-time approach that provides

exactly the resources required to deliver a specific piece of video content at any given time. If no-one is watching a channel, it simply frees up those resources while reducing energy usage.

This methodology provides time to market and considerable energy and cost advantages over existing cloud approaches and ensures that every deployed resource has a purpose. For example, for long tail content unique, just-in-time technology reduces cloud costs up to 67%.

Does this new 'oven' for just-in-time delivery exist today?

Yes, it has been developed by Synamedia's Quortex. Its multi-tenant SaaS technology builds video streams on-the-fly, based on the end users' requirements and matched to viewers' locations, devices and time zones. It quickly adapts to fluctuating audience demand, unpredictable network, infrastructure context and limitations, and automatically scales cloud resources up and down, reducing waste by using spot instances that take advantage of spare cloud capacity at a fraction of the typical operational cost, while maintaining the quality of experience. With it, video content is delivered when a viewer wants it, how they want it and in high quality – just as we like our pizza: with the toppings we want, saving the ones we don't for those that do.



Why is this just-in-time more sustainable?

While it is eye-catching to use figures about energy savings, there are no standard formulas or data points to ensure we are not comparing apples with oranges. To get a realistic sense of energy costs savings video delivery must be evaluated from beginning to end. Let's start with the CDN.

CDNs were historically designed to deliver web content. As streaming video emerged, technology developers fine-tuned the CDN for video with optimized caches that ensure that ABR content is cached as close as possible to the viewer for delivery at scale; such is the case of Synamedia's FLUID EdgeCDN.

Additionally, technologies such as Low Latency DASH, Low Latency HLS (LL-HLS) and the High Efficiency Streaming Protocol (HESP) have reduced the latency of live streaming to six seconds from 20-60 seconds, in line with broadcast, as evidenced on Synamedia's VIVID Low-Latency OTT solution.

Thanks to massive advancements with technology, content providers can now optimize the latency for different applications within a service, making it easy to launch new monetization applications, and save compute and storage resources.

How do you measure the cost or energy usage?

It's no secret that there are challenges when it comes to quantifying CDN energy usage and much of this is due to a lack of consistency across the industry. The three main discrepancy factors to consider include:

1. Energy consumption of different technologies are totaled and tracked in an inconsistent way. Instantaneous load and memory impact CPUs and the industry has yet to decide how to measure – whether it's measuring transport by volume or by capacity.
2. There are networks that connect internal and external servers. In traditional, non-shared environments, servers can be turned off to lower energy costs. However, servers that are shared internally (multi-tenancy) and externally (connected over the Internet) are connected via a network and that network cannot be shut down.
3. Content that is thought to be more essential than others and in some cases, is mandated to be delivered. Think of natural disaster warnings for example. This content is traditionally stored in cache on an edge server and future requests for that content will be served up via that cache which can reduce energy usage because it's not downloaded from its origin every time. The challenge here is that the cache uses energy as well.

To overcome these challenges, an industry-wide consensus needs to be reached. Organizations like [The Greening of Streaming](#) are focused on helping create unified thinking around end-to-end energy efficiency in the technical supply chain that underpins streaming services.

As the industry standardizes its measuring methods savings will become evident, meanwhile we will continue to deliver the 'hot pizza' how and when it's demanded!

Object Matrix

Finding innovative approaches to sustainable video delivery

As media organisations look to improve operational efficiency, by maximising resources and time, there is a growing realisation that a more unified approach to digital asset archive storage is required. Workflows need to be better connected, and in order to work more efficiently, users need accelerated search and access capabilities.



Nicholas Pearce
*Co-Founder,
Object Matrix*

Improved media asset security, better auditing, and more automation aren't just nice to have features, they are essential tools for companies to respond to the ever-increasing scale of content production. By transforming workflows, media organisations have the opportunity to bridge the gap between creatives and content. However, there are a number of barriers that need to be overcome along the way, such as poor storage practice, legacy infrastructure and ineffective media orchestration.

Outdated, ineffective storage practice

Events of the last two and a half years have really shone a spotlight on how media organisations manage their assets. Poor storage processes are causing real headaches for production and post-production teams as they search and locate content. Delays in finding footage can impact not only the editing workload for that day, but when multiplied across assets it can seriously impact lead time for entire projects. It means that companies might need to allocate budget to additional freelance resources or risk missing deadlines. Organisations need to think about optimised media storage as a crucial component within the workflow. The time saved at the stage where content is accessed can significantly improve overall operational efficiency. By removing any variables that might mean assets are difficult to find, or worse lost completely, teams can respond to project demands much more dynamically.

Some of the most problematic storage practices include lack of formal processes for backing up and archiving content, and the use of separate data silos. These practices can result in lost or difficult to find assets, and the inability to search using keywords and relocate assets when needed can result in duplication

and disorganisation. All of these factors contribute towards creating a system that does not enable users to work in a logical and intuitive way, hindering editors' ability to directly search for footage, and content managers' ability to control media asset libraries. If producers and editors cannot self-serve access to content then time and money will be lost.

Media orchestration and scaled storage

In terms of media orchestration, the absence of a tiered or hybrid storage platform is another example of poor practice that can and does cause real problems. It's important that media companies recognise that not all assets are the same. Some content needs to be actively worked on with nearline accessibility, either on-prem using integrated, virtualised access for dispersed teams or with minimal egress costs if stored in the cloud. Other content can be archived but the footage may need to be revisited, perhaps during key milestones or anniversaries. Some assets are very unlikely to be accessed again and just need to be kept for posterity, so these can be placed in cost-effective deep archive storage.

A hybrid data storage system using non-proprietary solutions, which allows ageing assets to be moved from one level to another, makes for a more efficient approach. A clear process for retrieving footage and utilising metadata tagging for automation where appropriate, results in a much more streamlined and integrated workflow. Unless an effective future-proofing strategy is implemented that allows users to easily search across several tiers of storage in different locations, operational efficiency can never be achieved.



Equally important is the need to recognise that storage requirements are not static. As business needs change, storage may need to be scaled accordingly. But many solutions can leave media organisations locked into agreements or struggling to access the metadata associated with their content. The ability to respond in a flexible and agile way to business needs, is arguably more important now than ever before. In 2021, the [value of the media and entertainment market](#) reached 2.34 trillion U.S. dollars, experiencing a growth of 10.4 percent compared to 2020. In the following years the growth is projected to slow, but figures are expected to reach 2.93 trillion by the end of 2026. That is a lot of media content, and it all needs to be stored.

Legacy infrastructure and integration

In addition to the influx of new content, companies also need to consider their huge media archives and the legacy infrastructure that supports them. While adopting cloud storage may seem like the answer to establishing a fit for purpose system that addresses the various issues, unless a media company is born in the cloud, there is sometimes still a business requirement for an on-prem cache of storage. This leads to the thorny issue of how to integrate new, shiny cloud-based storage with existing on-premise storage. Establishing cloud-based storage in a disjointed way without integrating with current storage is clearly a path to disaster.

There are a great many proprietary storage solutions on the market, and these solutions may work well in isolation, but they do not, by their very nature, allow for integration with third party vendors, or toolsets. As a media company, if you're trying to create seamless connected workflows, the inability to integrate vendors and solutions is a real sticking point.

While it can be challenging to integrate cloud storage and on-prem storage in a hybrid workflow, it is not insurmountable. Key components for an efficient storage system, that enables both end users and media managers to locate content, means tight integration, a unified system and the synchronisation of media and metadata. Successful hybrid workflows need media to be accessible across all cloud and on-prem locations, and those assets need to be controlled through a centralised interface.

More staff work remotely now than ever before, and the business case to transition away from legacy infrastructure has never been more pressing. But accessing content through virtualised infrastructure comes with security considerations and its own set of challenges. Clearly, security of assets has to be a top priority when

transforming and connecting workflows, but it cannot restrict ease of access for valid users. When it comes to media asset security, features such as firewalls, data immutability, and data encryption, all help to reduce the risk of a security breach. But without a connected hybrid system and a central point of access, companies cannot optimise built-in auditing to track user behaviour. By implementing strong user authentication, media companies can find a balance between streamlining infrastructure for ease of use and keeping precious assets secure.

Media and metadata management

Poor metadata management is a real barrier to achieving operational efficiency. Searchable content goes hand-in-hand with hybrid workflows, if organisations don't know what they have stored on-premises and in the cloud, it's as good as lost. Timecode metadata is key to enabling end users to search and monetise an archive. Using AI to automatically enrich media assets with timestamped metadata helps teams to quickly find exactly what they're looking for among their content archives. Metadata belongs to organisations and not their vendors, and therefore, it is vital that metadata can be ported across MAM, DAM or PAM, on-prem or cloud storage.

As media companies seek to work quicker, better, smarter and more securely, there is a strong argument for reviewing and transforming workflows so that a more unified and connected approach can be taken. But it is also the responsibility of vendors to champion interoperability with their solutions so that content doesn't become siloed. In the new era of high-volume content production there is no room for inefficiency. By thinking laterally about their storage requirements, organisations can establish systems that are connected, intuitive and fit for purpose. Systems that will, most importantly, help users collaborate and protect content – whilst evolving alongside media organisations as we enter a new future of entertainment.



Why Collaboration Between Content Providers and ISPs is the Path to Sustainable Streaming

Streaming is progressively replacing broadcast as the primary form of video content distribution, driven in large part by the success of global over-the-top (OTT) video platforms such as Netflix, Disney Plus, and Amazon Prime. [Grand View Research](#) predicts that the value of the global video streaming market will grow from \$59.14 billion in 2021 to \$330.51 billion in 2030, at a compound annual growth rate of 21.3% over the forecast period.



Damien Sterkers
Video Solutions
Marketing Director,
Broadpeak

A significant technical challenge with streaming is that it implies one-to-one connections from the client to the network servers, whereas broadcast distributes the same video signal for all users (see Figure 1). In other words, 1 million viewers watching a hugely popular sport event requires 1 million physical replicas of the same content on the network, compared with only one for broadcast.

As a consequence, video traffic has been growing exponentially. The popularity of streaming creates additional load on networks and requires the deployment of new network infrastructure, increasing energy consumption.

Strategies for Mitigating the Energy Expenditure of Video Traffic Growth

Some will argue that increasing hardware performance will mitigate the carbon footprint of video delivery, despite increasing traffic volume. But this assumption is risky, and in any case, increasing hardware performance to reduce carbon outputs is far from reaching the environmental goal set by IPCC and majority of governments. Regulations have been put into place not only to stabilize the carbon footprint but to dramatically decrease it in the coming years. (See Figure 2.)

The good news is that the amount of energy used to deliver streaming services can be reduced. There are three key ways to make video delivery more energy efficient while leveraging existing infrastructure:

- First, third parties, including content providers, can use the ISPs' networks to decrease the need for new infrastructure and move delivery closer to end users (which also improves QoE). Ultimately, collaboration between ISPs and content providers can result in more revenues for ISPs, allowing them to maintain their network and improve their energy efficiency.

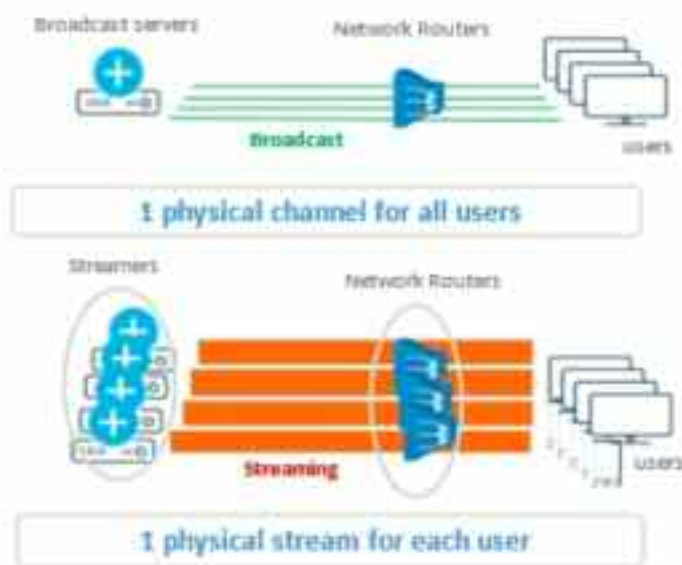


Figure 1. A comparison of broadcast and streaming distribution



- Second, content providers can stream video via multicast ABR. With this approach, only one stream is delivered over the network to address millions of viewers compared with one stream per viewer in a traditional ABR delivery scenario.
- Third, operators can continuously optimize the integration of the CDN software on hardware, with the objective to reduce power consumption for the same streaming throughput.

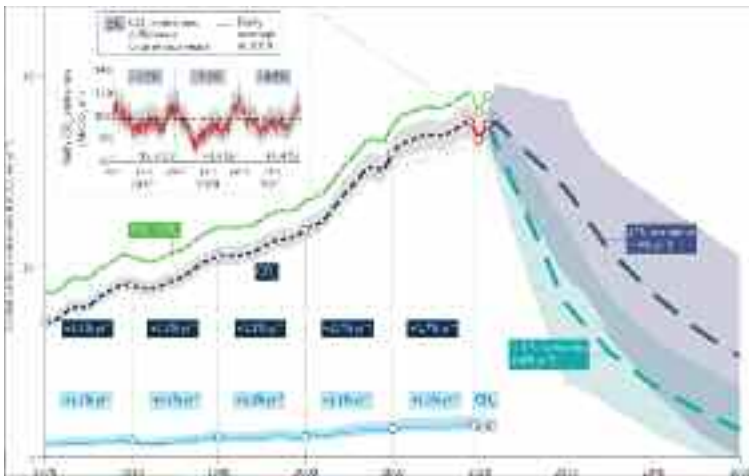


Figure 2. Global CO₂ and CH₄ emission trends, courtesy of Carbon Monitor

Ultimately, relying on incremental optimization of network components won't be sufficient for what is at stake. Industry professionals need more data and standardized practices to be able to speak the same language, work together, and develop best practices. Clearly, this requires coordination across the ecosystem. If streaming platforms, telcos, and their technology providers are committed to making an environmental impact, they need to work together to find new ways to deliver video.

How Content Providers and ISPs Can Collaborate Via Edge Caching

A good starting point of collaboration between content providers and ISPs is to minimize the deduplication effect mentioned previously and ensure that the same program is never unnecessarily replicated continually on networks. This is a problem that ISPs have already addressed with a simple solution that could easily be extended to third-party content: edge caching.

The principle of edge caching is to send content only once and to cache popular content deep in the ISP network so that duplication and streaming are done as close as possible to the end user. This allows for dramatic savings

in network infrastructure (see Figure 3), which consequently reduces the environmental impact. Ultimately, it's a win-win situation for everyone: end users can enjoy better streaming quality, which benefits both the content provider and the ISP.

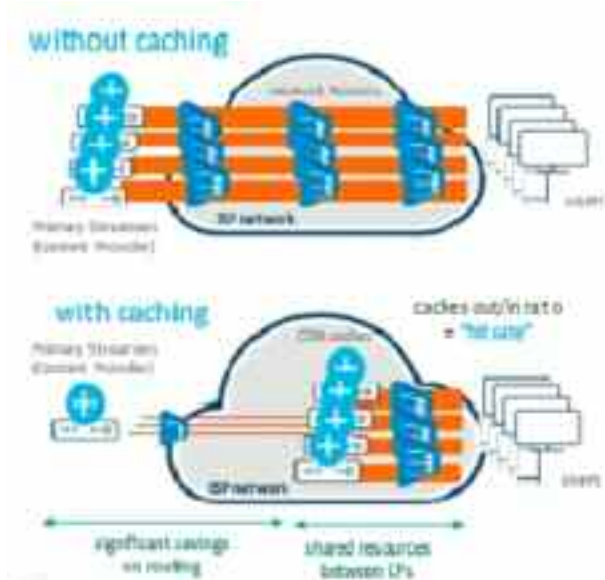


Figure 3. Video content delivery pathways with and without edge caching

Moreover, external streaming content making use of ISP caches can, at the same time, take advantage of all the software optimization that ISPs have been implementing to distribute their own content. ISPs have been offering video services long before OTT platforms gained prominence. Content providers could leverage ISPs' delivery experience to their own advantage, improving environmental sustainability.

One good example of such an optimization is for content providers to leverage the IP multicast capacity of ISPs whenever available. OTT ABR can, thanks to multicast ABR (MABR), transit throughout the network in the same one-to-many mode as broadcast and be delivered as ABR directly in the home network via a dedicated conversion process. The conversion typically takes place in an IP gateway or a set-top box. (See Figure 4.)



Figure 4. Video content delivery pathway with MABR caching

Another example is caching elasticity – namely, the ability for ISPs to progressively push the edge of their network further and dynamically adapt cache instances on the actual streaming demand from end users. This evolution is particularly relevant for mobile networks and has been popularized by the Multi-Access Edge Computing (MEC) initiative developed in the 5G standard.

The concept of ISPs sharing their video distribution with third-party streaming content providers – often referred to as ‘Open CDN’ – may seem technically straightforward, but it can be complex in terms of defining the relationship between the two entities:

- If a content provider has an international offering, it will likely want to work with a few different ISPs to establish a relevant footprint. Conversely, ISPs with such capability will want to onboard many content providers to rationalize their investment. The technical interface between them must be as simple to implement as possible to ensure scalability. Several technical tools are being developed with that purpose in mind. The SVTA Open Caching standard is expected to play an important role in setting up a common technical framework.
- Content providers and ISPs have only recently started discussing business agreements, and it will take time before the topic matures enough to reach a consensus on who provides which service and for what price. That said, content providers today have normalized business for their content delivery with public CDNs, and Open CDN could use the same model as a starting point of reference, potentially accelerating its adoption.

Conclusion

Looking at the current situation, the potential for improvement is huge, and caching all streaming content deep in ISP networks is one of the most obvious approaches to start with. If video streaming stakeholders want to comply with the minimal environmental targets, it is inevitable that they will need to start collaborating.

Of course, collaboration will require content providers and ISPs to develop tools and practices to make their interactions as simple and scalable as possible. The outlook for that happening is optimistic, given that everyone would benefit: the content provider will realize better service quality; the ISP will optimize infrastructure costs; and the planet will be greener since there will be less network equipment deployed.





Cerberus Tech

The Convergence of Self-Service and Sustainability in Broadcast

The transition to Software as a Service (SaaS) and Infrastructure as a Service (IaaS) models was already underway prior to the pandemic, but it was yet to truly transform the broadcast industry. As referenced in an [article by IABM](#) in the summer of 2019, despite the known advantages of leveraging cloud infrastructure, the fear of workflows breaking down, interoperability, and the complexities of migrating legacy systems and data, were all real barriers to transition. But the pandemic helped to change this, because suddenly, cloud-based broadcast operations were the only viable option for any kind of business continuity.



Chris Perkiss

*Head of Operations
Cerberus Tech*

Out of necessity, many media organisations quickly moved their workflows to the cloud. This change proved that next-gen methods were both technically and logistically possible, and it became apparent that on-demand, cloud-based infrastructure offered efficiency, control, and cost savings. But what about sustainability? That's where the industry can go beyond technical future-proofing, and start thinking about future-proofing the planet.

The transition to a self-serve culture

The interplay between spin-up/spin-down infrastructure and a self-serve approach to workflows offers lots of potential for environmentally conscious broadcasting. Despite the significant changes to the industry of late, the overall preference from broadcasters is for familiar and repeatable contribution and distribution workflows. Therefore, this needs to be carried through into an IP environment. Using a consistent approach within broadcast-grade IP means that while the implementation of resources can vary, the underlying broadcast environment stays consistent. Spinning this environment up and down, within an easy to manage interface, means that familiarity is maintained and resource utilisation is optimised.

We're seeing swathes of media organisations transitioning their workflows and content to the cloud in order to benefit from the advantages that brings. However, certain elements of the broadcast workflow have transitioned to a self-serve mindset more readily than others. As self-serve adoption continues for areas such as cloud storage, where teams are searching and locating their own content from the archive – the outlook for IP contribution and distribution is more mixed. Overall, we seem to be heading towards a self-serve culture, but one size definitely doesn't fit all.

Familiar and repeatable workflows

Media companies are seeking solutions that best work for the requirements of their operation, and that suit their technical capabilities and expertise. These factors play a big part in the decision about whether to opt for a self-service approach or a more managed service. While the benefits of cloud-based infrastructure are well-documented, the sense of familiarity that media professionals have with traditional workflows is often lacking when it comes

to operating in the cloud. With traditional models, workflows follow a known format and the lines of responsibility are clear, in contrast, with the cloud there is a concern that engineering teams will be unable to respond to challenges.

To deliver IP feeds to multiple locations, it is important to decouple ownership for the outputs from the responsibility for input provision and rights assignment. This shares the responsibility for the provision and switching requirements, in the same way that traditional satellite and video switches operate. The content owner can create their own broadcast-grade IP environment, to deliver and monitor feeds, as well as assign rights to receive, to other organisations. Affiliates can also create their own destinations, if necessary, and this ensures control over the delivery of the feeds. Due to the separation of source and destination responsibilities, it's possible for a broadcast operator to 'manage' the distribution of feeds to multiple locations through a central platform. This is how broadcast-grade IP optimises workflows at scale, even with different delivery formats. Once the framework is there, these workflows can become just as familiar and repeatable as traditional ones.



Managing resources and optimising for sustainability

It is important to look holistically at the content supply chain. Each organisation must take responsibility for its own impacts and reduce wherever possible, both on the vendor and the broadcaster's side. From a vendor perspective, there is a responsibility to recommend the infrastructure



that will work optimally for multiple use cases, rather than selling proprietary solutions.

Using a self-serve approach to contribution and distribution, allows content owners to become architects of their own content delivery, and paves the way for more sustainable ways of working. After the infrastructure is set-up, it is the flexibility of the model that offers the most benefits. With IaaS there is the option to match infrastructure usage to requirements. Broadcasters can significantly reduce wasted bandwidth and stop cloud infrastructure sitting idle. As technology evolves, it is going to facilitate a more sustainable cloud-based model for the industry. It stands to reason that on-demand cloud solutions are more sustainable than traditional hardware, which is based on-premise. This is because organisations are running less hardware, and only utilising resources when needed, which makes operations more efficient.

There is, of course, a lot less physical movement of people and hardware around the globe when using the cloud. This made cloud broadcast workflows an optimal solution during the pandemic, and it also demonstrated how a huge reduction in industry's carbon footprint could be achieved. However, at the moment, reporting and quantifying the exact carbon footprint of those workflows is challenging.

The major cloud service providers have developed some high-level tools for measuring carbon use and impact. Unfortunately, the data isn't presented in a consistent way, therefore it needs to be interpreted and interpretations can obviously differ. In time, with further granulation of usage data, companies can start to get into the detail of fully optimising cloud resources for broadcast.

An ongoing journey

Where sustainability is concerned, the industry is currently on a journey which the cloud can help to facilitate. Initially, a company's actions should be to identify impact and make some 'quick win' changes, but as data consistency improves we can push the expectations of what the cloud can facilitate much further.

It would be idealistic to say that sustainability is at the forefront of every media organisation's

business plan. Decisions on which suppliers to work with are primarily made on the basis of cost and technology, so it makes sense to get those things right first, and then integrate sustainability calculation features. But the huge benefit of the cloud for broadcast, is the agile model which responds to the varying requirements of different organisations. As long as a cloud and protocol agnostic framework underpins the workflows, then the technology can evolve with the industry. This concept of making incremental improvements, without ripping out the hardware and starting again each time, is certainly going to have more impact than making sustainability the primary selling point above capability and cost.

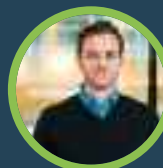
Like the transition towards cloud-based operations, sustainability is an ongoing project that many media businesses are only just starting out on. In both cases, it is crucial to make sensible choices about infrastructure, so that it is adaptable and sustainable for the long term. In fact, the two things go hand in hand. Originally broadcast organisations which were looking to reduce operational costs, then arrived at IP infrastructure to distribute and contribute content globally. It was a natural progression. Therefore, it seems likely that companies looking to maximise efficiency in the cloud, will ultimately arrive at more sustainable workflows.

There are obvious benefits to a cloud-based model over traditional workflows, but cloud-native workflows will develop this even further. The industry is heading towards a future where organisations needn't be tethered to hardware; instead broadcast workflows can run on virtual machines in the cloud. Cloud-native workflows are still using hardware somewhere, and a machine is still generating data and consuming power somewhere. But by optimising the approach, we have the ability to only utilise and consume resources when they're needed. Then as organisations are consuming, we should work to make the right choices for the environment. This echoes the domestic sentiment for energy consumption. It's great to get your power from an eco-friendly source – but it's even better to turn the light off when you're not using it.

Deltatre

The planet is under threat; what can our industry do to protect it?

From intensifying wildfires in the US, to floods in Australia, and what is likely the worst drought in Europe for centuries, 2022 is a stark reminder of the real-world impact of climate change globally.



Andrea Marini
CEO, Deltatre

What we are all experiencing is unlike anything we've seen in our lifetime, and it is becoming clear that the window for action is closing. As a business with well over a thousand full-time team members across 14 countries, we have a huge responsibility, and opportunity to effect real change and this is true for business leaders across our industry. Working proactively on environmental reporting and performance-related initiatives to reduce our environmental impact has never been more vital. I want to know that business decisions we make at Deltatre are working to protect the planet for future generations. Now is the time for action that will make a difference. Despite how challenging implementation can be, by doing this collectively our industry can make a significant difference.

For many organizations, they are already on the road to sustainability by committing to goals set with the Paris Agreement. This UN initiative calls for businesses to pledge making tangible changes to their carbon footprint that would limit global temperature rises to 1.5°C above pre-industrial levels. This involves reducing emissions by 45% by 2030, to reach net zero by 2050. But what does that mean in real terms for the media industry?

The importance Net Zero by 2030

Despite the ambition of the Paris agreement, both the effects felt this summer and the data on global warming confirms that action to mitigate the impact is falling short. Based on the current [Climate Action Tracker](#) thermometer, we are on track for 2.7 degrees of warming based on real

world action and current policies. We are currently at around 1.2 degrees and significant action is needed to stem rising temperatures and limit the effects that are now being keenly felt across the globe.

To achieve this, the 2050 timescale for net zero needs to be revised with a goal to reach net zero by 2030. It is a big ask, but leaving the 2050 targets in place will almost certainly mean we are guilty of doing too little, too late. As we experience the extent of the impact of global warming on the planet, as an industry we have a responsibility to acknowledge there is more we can do and implement it. At Deltatre, we are firmly focused on [achieving net zero by 2030](#). We are taking stock and already have some secured action plans. Like the whole industry, we're working hard to complete climate action plans associated with every aspect of our vast business on the accelerated timescale needed for a 2030 deadline.

Offsetting as a last option

Having established the net zero aim needs to come much sooner, the next step is to look at how. There is of course a place for carbon offsetting, where businesses can invest in environmental projects to balance out their own carbon emissions. However, this should only be done after most of the emissions in business operations are reduced and avoided. After that, an acceptable 5-10% of unavoidable emissions may be offset. To try and carry on with 'business as usual' and just pay to offset emissions is unhelpful and is of little benefit for the planet.



There are not enough projects to make mass offsetting a viable option – we must reduce business emissions across multiple areas as soon as possible.

Businesses therefore need to analyse their existing practices, identify the emissions, and find a way to introduce changes which allow for reductions. There isn't a magic wand or silver bullet when it comes to making the changes needed to slow the rate of global warming. It requires commitment from senior leaders in businesses and buy-in from all stakeholders. That way when changes are challenging to implement, everyone can understand the reason for it and transformation is more likely.

The benefits of a business-led approach

So, following the initial phase of analysing, what should action look like? Businesses have a huge role to play. In the UK businesses account for almost a fifth of carbon emissions meaning if they take action to move to net-zero we will see significant benefits. However, businesses also have huge influence. They have the opportunity to educate their employees and customers which means the potential positive impact of businesses is actually even greater.

The reality of climate change and pollution is stark – take as an example that there is now [no clean water anywhere on earth](#). Despite this research hitting the headlines, for many it has flown under the radar. This demonstrates how critical it is that we as businesses take responsibility for educating our teams.

This process can take many forms from educational seminars for employees, to on-the-ground environmental work such as [cleaning up a local river](#). Regardless of format it is a foundational part of ensuring businesses make long term changes that benefit the environment. It not only makes a positive impact in its own right, but creates behaviour shifts in employees' personal lives that take the potential impact beyond the 18% business emissions we mentioned. Furthermore, by shifting the mindset of the workforce, we change the overall business ethos putting sustainability at the centre. The impact is that business decisions organically keep environmental goals in mind. This makes the process of taking positive action on climate change

part of conducting business as usual which is a big step in the right direction when it comes to achieving net zero by 2030.

Getting our heads into the cloud

With that environment-centric approach in mind, how can our industry specifically have a positive impact on climate change? The media industry has changed drastically as a result of Covid as the pandemic forced more remote working. It meant teams that would normally travel to work on-site shifted to a cloud-based strategy in order to deliver business as usual when the world turned upside down. Those changes may have been forced by pandemic practicalities, but they should be embraced as part of our sustainability strategies.

Take for example the broadcast graphics for [Indian Super League](#). Previously broadcast graphics would have been produced by a team on-site involving significant carbon emissions from long-haul flights. The pandemic made this impossible and made a shift to a remote, distributed operations model essential. We saw that this change did not impact the ISL's ability to successfully deliver the 2020-2021 season. Given that business travel is one of the highest sources of measurable carbon emissions, exploring cloud-based models that have proven they are capable delivering the same level of services is a big step in the right direction for our industry.

Moving forward

Making significant behavioural changes and adapting how we as an industry work will undoubtedly have a positive impact on our carbon footprint. However, the data couldn't be clearer in showing us why we must take on the challenge of meeting adjusted 2030 targets to limit the damage we are inflicting on our planet. We must continually reflect on how we can improve, from encouraging behavioural changes to adapting how we develop solutions and deliver services to minimize the environmental impact. Meeting climate ambition targets must be seen as ongoing journey not a box ticked; only by taking this approach can our industry play its part in putting the earth on the trajectory it needs to be on to protect it, both for us and generations to come.

KitPlus Auctions

Sustainability and the environmental benefits of the circular economy

There is now widespread recognition in boardrooms and investment companies worldwide that environmental sustainability is aligned with business sustainability. Auctions in the broadcast industry have always been a great way for users to get a significant discount on the price of new and used equipment, or to generate income from assets they no longer need, but now the environmental benefits of enabling the reuse of these assets as part of the circular economy are becoming clearer for equipment distributors and manufacturers alike. The ability to measure this impact and report on the carbon avoided is a way that both buyers and sellers can celebrate their positive contribution.

Dan Main *KitPlus Auctions*

The Focus on Sustainability

Investors are raising the priority of ESG (Environmental, Social and Governance), and there are multiple examples (Boohoo and Exxon to name but two) where the impact of this has been felt in the boardroom. The view is perhaps best summed up by the words of investment group Engine No.1 (not a green fund itself), "We strongly believe that climate risk is business risk". For suppliers bidding for government contracts in the UK, as of September 2021 they must have a commitment to net zero carbon emissions by 2050 in order to be considered for new contracts. So the requirements for sustainability are not some distant future requirement, they are very much in the present.

There are many different ways that businesses can work towards achieving net zero, but one of the oldest sales methods in the world, the auction, has a compelling set of reasons to incorporate in your business model.

Traditional benefits of auctions

The idea of selling your surplus broadcast assets isn't a new one – we have been helping our clients do this for years. The two traditional benefits of selling your surplus assets are :

- Generating revenue from the sale of idle equipment or surplus stock

- Reducing the costs associated with those idle assets (costs to store, maintain and insure).

For a seller, one of the key factors of an auction is that they are a date-certain, time-specific method of closing a sale for the best value in a competitive buying market. Manufacturers, distributors, resellers, and broadcasters can have a large stock of surplus items; this is a method of working through that stock quickly rather than having to wait for buyers to approach you as they would in a 'store' or e-commerce model. Our average auction, for instance, has between 300 and 600 lots (and some lots will contain multiple items), with > 90% sell through rate.

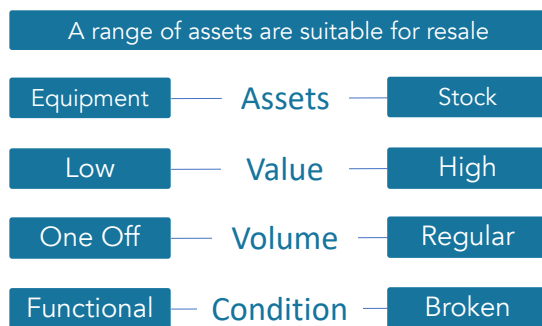
As a buyer, you are facing longer lead times in the face of a rapidly changing technological landscape and client demands. While auctions are not generally a suitable procurement route when you have very specific requirements, if you can be flexible, you can find equipment that in many cases would require several months to source. Also, there is no protracted negotiation process. The winning bid is the final price. Invoices are issued within hours of the auction closing, and often once payment is received the item can be collected as little as 24 hours after the auction closes.



The environmental benefits of auctions

For the environment and society, there are now multiple benefits being recognised. Firstly, by buying used over new, or enabling your surplus assets to be bought, you are avoiding the raw materials needed to produce a new item. Equipment from an auction often goes to developing countries (recent high-profile auctions had buyers from 51 countries participating), and can enable the creation of entire industries in these countries that otherwise could not have afforded the equipment new. There is also a measurable carbon impact avoided, and we can produce figures from an auction that can be incorporated within annual ESG reports.

In addition, we have found that buyers can take ingenious approaches to the reuse of assets. It doesn't always have to be a valuable item to be sold at auction, and waste items can even be incorporated into a sale and/or donated to charities. During one auction in early 2022, an enterprising buyer even took the chemical toilet!



We're proud to announce that we're also introducing a carbon measurement on the site, showing the positive impact of buying used in terms of the carbon avoided from a new purchase.

Reducing costs, creating revenue and having a positive impact on the environment, all without spending money up front, makes auctioning your surplus assets an attractive opportunity. Even before the additional benefits of circulating products and materials were added to these factors, for many companies this was already a highly profitable and strategic activity. Data from

asset resale can also be fed back to procurement, ensuring that information on end-of-life value is incorporated into Total Cost of Ownership (TCO) analysis. It can be used by accounting, ensuring that asset depreciation is realistic. It can also allow you to ensure that you keep abreast of current technology, if you know that you have a route to market for assets after several years of use.

It has also proven to be a popular, low risk method of raising funds, quickly and easily contributing to investment in more current and future technologies.

KitPlus Auctions is a partnership between KitPlus, established in 2005, a global online marketplace for advertising new and used equipment for sale in the Broadcast, Film and Video industries, and CA Global Partners, an auction company established in 1997 with worldwide experience in selling surplus broadcast equipment and assets from company closures.

CA Global Partners is also part of the Ellen MacArthur Foundation community, a charity working with business, government and academia to accelerate the transition to a circular economy.

For more information

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w: www.kitplusauctions.com

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Singular.live

Sustainability means cloud-native not cloud-based

In the summer of 2015, Hubert Oehm was surrounded by a gallery of hardware vision mixers in the middle of the intense heat of Qatar. He was working on a graphics project for a major broadcaster in a huge control room. As the wall of machines whirred and the air conditioning strained to keep them cool with the surrounding desert approaching 50C, he knew there had to be a better way.



Mike Ward
Head of Marketing,
Singular.live

Was there an alternative that didn't require all this expensive, landfill-destined hardware, significant power consumption, and his presence on-site? Oehm was simply adding a layer of graphics to live video – the process suddenly seemed extraordinarily wasteful. After an intense period of research, he envisioned a revolutionary, significantly more sustainable, solution. What if all this hardware, with its huge carbon footprint and price tag, along with its specialist operators, could be replaced by an entirely web-based platform harnessing HTML?

Singular.live was conceived the following year with Oehm as CTO. It has since replaced countless numbers of these machines, along with their transportation, the power required on-site for them to function, and their operators' travel and accommodation. We've helped initiate the dramatic shift from traditional broadcast infrastructure, with its hardware-based vision mixers, toward the cloud.

Yet, the industry can and must do more to avoid using hardware and make production more sustainable.

Cloud-native vs Cloud-based

When assessing the environmental impact of graphics solutions, it's important to distinguish between 'remote' or 'virtualised' production and a cloud-native approach. Remote production calls itself 'cloud-based' as it utilizes the internet and therefore can be produced remotely vs. traditional on-site production workflows. Yet it still relies on dedicated hardware, whereas cloud-native does not. Dedicated graphics rendering hardware is inescapably unsustainable.



As well as the emissions required to produce and power it, it is also incredibly hard to recycle or safely dispose of. The hardware lifespan varies but it's typically only around 3 - 5 years. The industry sometimes attempts to re-use this hardware at the end of a rights cycle but it is typically amortised over that period.

Advances are needed to make hardware's end-of-life more sustainable by recycling components and ensuring safe disposal of its hazardous material (which includes heavy metals and carcinogenic toxins) which can enter waterways and the atmosphere. The most sustainable approach is to avoid dedicated hardware altogether with a cloud-native platform.

Assessing Our Impact

Albert – the BAFTA-owned, industry-backed organization – recognized our positive impact by awarding its sustainability accreditation to Singular in 2019, and we remain the only live graphics platform to have achieved this recognition.



Building on our Albert accreditation, we were eager to use our platform and expertise to further analyse and increase the sustainability of live production with the ultimate goal being a carbon 'net zero' future.

That's why Singular instigated a project that subsequently united competitive broadcasters for the first time to collaborate on a proof of concept with the longterm vision of creating a more sustainable industry future.

The challenge was part of the Accelerator Challenge organized by IBC and coordinated with BBC Sport, BT Sport, Sky Sports, English Premier League, Premier League Productions, SuperSport, NBCUniversal and albert.

This project has allowed the industry, for the first time, to confidently say that cloud-native production is even more sustainable than remote or virtualized alternatives as it dramatically reduces the need for hardware, therefore, reducing emissions from its manufacture, power, and transportation.

Specifically, it demonstrated a reduction in the amount of technical infrastructure required for the gallery production by up to 70% vs a remote production. It further demonstrated that the cost of fuel usage can be more than halved versus on-site.

Collective action on climate

Being cloud-native we make assumptions that therefore we are a more environmentally friendly platform than say, going out and buying graphics hardware and shipping it around the world. But we don't know categorically because we don't receive any measurement from our cloud providers. Other participants in the IBC Accelerator trial including Sky, the BBC and BT Sport echo this frustration.

This challenge is not confined to one vendor nor just graphics solutions. The entire broadcast infrastructure is being re-engineered to take advantage of micro-compute services. This distributes workloads across different servers that are shared with other companies and have spare capacity at the time. Undoubtedly, this is a more environmentally friendly alternative to building or defining dedicated computers since this enables an existing resource to be activated only when needed to as opposed to building and powering bespoke servers 24/7.

Unfortunately, using multiple shared servers does make accurate power calculations impossible at this stage.

Added to that, the servers are powered using a mixed power supply infrastructure which includes both fossil fuels and non-fossil energy such as solar, wind, and hydro.

As a result of initiatives like the Accelerators, light has been shone into this black hole. Cloud providers are fully cognisant of the demands being laid down by broadcasters and are now actively engaging with the industry to collaborate on this. Singular.live are committed to working with AWS and others to develop a carbon emissions calculation methodology.

Sustainable Live Production

Sustainability is one of our core values; it was at the heart of our conception as a platform that dramatically lowers emissions by eliminating the need for dedicated hardware and transportation.

We're proud that this aligns us with the UN's Sustainable Development Goal 13 on Climate Action, and are aiming to embed our social and environmental mission and impact by working towards B Corp certification.

Cloud native solutions are essential to achieving effective remote working, global collaboration and to driving more sustainable working practices. If the solution is not cloud native it is just a stop gap to the inevitable future.



Shure

Shure helped save more than 20 Million batteries from landfills in the past 5 years

With more focus from customers on sustainable products, Shure is outlining ways it has invested in the planet through environmental responsibility initiatives.

Green is not only in the logo, it's an important part of the company's mission. In fact, through the company's innovation in the audio industry, these efforts have resulted in millions of batteries saved from landfills.

One of the most impactful things Shure has done for the environment is reducing the amount of batteries disposed of and placed into landfills around the world. Concerts, theater performances, meeting and live events have gone much greener lately due to a variety of Shure products that are now rechargeable.

In the past five years, Shure estimates that it has eliminated more than 20 million batteries from being used. By 2027, Shure expects its products to prevent 100 million more batteries from going to landfills as more customers convert to rechargeable Shure products.

Shure rechargeable packs and mics have changed the way concerts, theaters, meetings and other live event venues operate. In the past, disposable batteries were used to power microphones and transmitter packs during rehearsals, then replaced with a fresh set of batteries before the performance, and replaced afterward. This led to a significant disposal of batteries.

With Shure's rechargeable wireless audio technology – the first company to offer intelligent lithium-ion batteries for wireless microphones when it was launched nearly a decade ago – it has instantly transformed sound production into a much more environmentally friendly operation.

In fact, for David's Byrne's "America Utopia" alone, the monitor engineer estimated they saved 21,000 AA batteries from being disposed of in landfills because they used Shure's rechargeable system.

Other Product Initiatives

Shure works with suppliers who take action on sustainability, including suppliers who use solar power and recycled water in their operations. The Company is also working to approve water-based paints in the finishing process, which is friendlier for the environment.

Shure products are also engineered to last – from a durability and adaptive technology standpoint – avoiding costly replacements and unnecessary disposal of electronics, even as technology evolves.

The company has also engineered its products to help with overall power consumption, using less energy in 'down' modes and allowing remote monitoring of power use with Wireless Workbench Software.

Packaging

Shure has joined the Sustainable Packaging Coalition as it improves product packaging to be more sustainable. With more than 1500 different packaging pieces for a variety of different products, this is a significant undertaking. Some of the highlights include:

- Replacing thermoform trays with more sustainable, recyclable alternatives such as molded pulp.
- Reducing overall plastic materials in packaging.
- Reducing the amount of literature that accompanies our products.
- Right-sizing packaging for greater efficiency and reduced CO₂ footprint from shipping and storage.



New products will be packaged using 75 percent recyclable and/or renewable materials in 2023. In addition, the Company is also improving packaging sustainability by:

- Committing to source a greater portion of our paper and fiber-based packaging from suppliers that are certified by sustainable forestry organizations such as FSC, SFI and/or PEFC, with the intention to eliminate noncertified packaging by 2030.
- Optimizing packaging for efficient distribution and logistics (creating packaging that better fits onto pallets and shipping containers to maximize space, which reduces transportation fuel and emissions produced by excess shipments)
- Ensuring that existing product packaging is using greener methods. For example, we are working to replace plastic inserts with molded pulp wherever possible.

Shure has continued to take several steps to increase its focus on sustainability in packaging, balancing the need to protect sensitive, high-performance electronic equipment being shipped worldwide with being more environmentally responsible.

The Company recently joined the Sustainable Packaging Coalition and conducted an audit to assess sustainability of more than 1500 different packaging components. Shure has also implemented software solutions to help improve packaging design and distribution efficiency. Environmental impact assessments have been added to other environmental requirements as part of Shure's standard process.

But even before this, Shure was implementing greener packaging. In the 1980s, Shure changed the packaging for mixers by eliminating the use of Styrofoam, switched from white (bleached) cardboard to a natural brown color, and used a soy-based ink for the printing on the cardboard box. All the packaging could be recycled, except for the plastic bag that covered the mixer inside the cardboard container.



Facilities

Shure manufacturing plants feature robust recycling programs for cardboard boxes and wooden pallets, keeping literally 'tons' of cardboard waste and nearly 5,000 wooden pallets out of landfills.

Across Shure facilities, energy savings programs with LED lighting, motion-sensor lighting, smart climate control systems and other initiatives help reduce the Company's overall carbon footprint.

People/Partners

Shure supports a number of global and locally-based organizations dedicated to sustainability efforts and ecology, including the National Resources Defense Council, whose global purpose is to 'safeguard the earth – its people, its plants and animals, and the natural systems on which all life depends.' Their stated areas of work include: 'climate change, communities, energy, food, health, oceans, water, the wild.'

In addition to those efforts, our Associates around the world have volunteered for environmental clean-up efforts in parks and rivers in Europe, Asia and North America.



Compliance

A cross-functional Shure team regularly reviews international regulations, directives, and standards to ensure environmental compliance with regulations like RoHS, REACH, and WEEE. The nature of these regulations promotes sustainable electronics and electronics manufacturing.

More information about Shure's sustainability efforts is available at Shure's Sustainability Site, which includes an overview on the Company's approach to environmental responsibility through people, products, facilities, communities, and partners.



Blackbird

Making video more sustainable

The broadcast industry has been gradually pivoting to a model that enables more of the production to be done remotely and where crew remain in a single central location or even in their own homes.



Ian McDonough
CEO, Blackbird

The TV industry's effort to make production sustainable may be fatally undermined if the full cost of carbon from camera to consumer is not taken into account.

Watching online videos is not a passive activity when it comes to saving the planet. In fact, the total energy that goes into powering the internet's data centers, servers and networks that stream video content generates 300 million tons of carbon dioxide a year – equivalent to 1% of global emissions, according to The Shift Project. Another calculation noted by supply chain consultancy Ramprate estimated that the carbon cost of viewing linear TV in the old-fashioned manner in 2018 was 62 million tons. Meanwhile, TV streaming accounted for 19% of TV viewing yet was responsible for 31.6 million tons of CO₂ in 2020 – essentially doubling the emissions caused by linear TV.

The Cost Of Streaming TV

The carbon cost figures are for the U.S. only and are based on the 119 million households identified by Nielsen with homes with TVs in the country.

Alarmingly, if that trend is extrapolated to the most affluent half of the world's population (3.8 billion consumers), then this would equate to 3.6% of global emissions. That is nearly double the annual CO₂ output of the global aviation industry.

The Shift Project arrived at similar conclusions. It found that the share of digital technologies (servers, networks, terminals) in global greenhouse gas emissions increased from 2.5% to 3.7% between 2013 and 2019, and this footprint is predicted to double again by 2025.

What can be done?

Consider the carbon cost of a single email. It could be as minuscule as 0.3g of CO₂, but if you sent just one fewer email a day, it could save over 16,433 metric tons of carbon in a year.

Imagine, then, the cost of transporting high bitrate video around. It is unnecessary, it is inefficient, and it is unsustainable. When we realize that every little bit counts, no matter how fractional, then awareness of the issue becomes part of the solution.

The industry is beginning to act. Amazon has committed to being net carbon zero by 2040. Google aims to be carbon-free by 2030, ensuring that its data centers are powered by renewable energy. Netflix says it purchases renewable energy certificates and carbon offsets to compensate for any energy that comes from fossil fuel sources. Content delivery network Akamai has pledged to power all of its global operations with renewable energy by 2030.

Another key is in production. AT&T-owned European pay-TV broadcast group Sky aims to achieve net carbon neutrality in all of its production activity by





2030. Dozens of broadcasters and production companies – including BBC, ITV, Endemol Shine Group and Warner Bros. – are members of Albert, an initiative set up by BAFTA to help reduce the amount of CO2 and to raise awareness of the environmental impact of program-making.

Every Little Byte Counts

A primary carbon cost of making live programming lies in transporting kit and crew to a venue. Traditionally, this involves dozens to hundreds of technicians, producers and on-air talent – which, at the largest events, involves significant air travel, road freight and hotel accommodation.

The broadcast industry has been gradually pivoting to a model that enables more of the production to be done remotely and where crew remain in a single central location or even in their own homes.

It is a movement that has been accelerated by the necessity to keep live sports on the air during the pandemic. While remote production approaches make immediate savings in budget and carbon footprint, even more can be done. This involves taking steps to reduce the amount of data – the bits and bytes of the signal that travels from venue to production hub for a program to be made.

We collaborated with Green Element on a report on how new technologies can reduce the carbon impact of routine video editing and post-production activity, and we believe browser-based workflows that function at lower bandwidths come out on top.

Move Less Data And People Around

In conventional production, including most current remote productions, all raw video feeds are transferred to the production center to be touched (such as adding graphics) before being transmitted. The vast majority of video acquired from multiple cameras at the event is transported over networks to the production center but does not form part of the final program. This is clearly wasteful.

By contrast, being able to work on high-quality 'proxy' (copies) of the original video means less data is moved around. You just move the high bitrate content needed for publishing the final product – and you only need to do that once.

There is no need to constantly upload and download video every time the program is manipulated prior to going to air. It is extremely carbon-efficient, so much so that the report suggests that for a live event lasting two weeks – such as the Olympics – a browser-based solution using lower power can be six times more carbon efficient than other methods.

The transition to a browser-based solution starts by planning to make content accessible from anywhere. When content is freely available to certified team members from any internet-connected device, workflows and processes can be transformed.

The transition to a browser-based solution starts by planning to make content accessible from anywhere.

Workflows for the production of content for delivery to different outlets – social, digital and broadcast – will converge. Processes such as corporate branding and subtitling are automated in parallel. Greater efficiency reduces the transport of data and enables producers to create more content at less cost.

TV is responding. In its latest report, Albert shows that one hour of TV contributes the equivalent of 9.2 tCO2e/hr, which is a 10% drop from 10.2 tCO2e/hr in 2017. While the impact of many production activities has reduced significantly, the report also says carbon emissions from travel and transport have risen consistently between 2017 and 2019.

The media industry has a responsibility to communicate and to take a lead. We are already seeing a response to the challenge, but we can all do more.

WorldCast Systems

Rethinking FM Broadcast to Reduce Carbon Footprint and Drive Cost Savings

Global CO₂ emissions from energy combustion and industrial processes rebounded in 2021 to reach their highest ever annual level according to a March 2022 [report](#) from the International Energy Agency. In total, more than 36 gigatons of emissions were pushed over the air in 2021, a 6% increase compared to 2020.

Combined with worldwide increases in electricity costs, sustainable energy has become one of the greatest challenges facing radio broadcasters.



David Houze
Product Manager –
WorldCast Systems

In the broadcasting chain, the transmitter represents the most impactful equipment as it continuously delivers a fixed output power to the antenna. In the FM chain, transmitters go from a few watts to dozens of kilowatts depending on the coverage area, landscape and radio listeners' profile.

After years of innovation, the new generation of FM transmitters integrates state-of-the-art technologies – such as the most recent LDMOS generation with up to 85% efficiency or the new high-efficiency PSUs. Combined with embedded features (RDS encoder, sound processor, stereo encoder, audio over IP decoder), efficiency has increased up to 76% for the most efficient transmitters. But the physical component optimization is almost reached; efficiency is not going to increase anymore.

To reduce FM transmitters' energy consumption, it is necessary to rethink the concept of FM broadcasting based on the incredible performances of transmitters and receivers.

A common misconception is to think that the technical objective of an FM broadcast chain is to transmit at a specific output power in order to cover a service area, but the real objective is to deliver a high-quality and constant listening comfort for listeners over the entire service area.

Listening comfort can be summarized as the signal-to-noise ratio. Is the listener disturbed by the noise?



Listeners' audio perception of the same noise ratio varies depending on the type of audio content. For example, with speech programs, the slightest disturbance will have a direct, negative impact on listening comfort. However, with highly processed music (covering the full audio spectrum), the noise will be easily covered by the signal itself. It is then possible to slightly reduce the signal-to-noise ratio without impacting audio perception.

WorldCast developed its SmartFM algorithm based on this concept. A psychoanalysis algorithm qualifies the robustness of audio content to perturbations. Then, when the signal is robust enough, the artificial intelligence adjusts the transmitter power accordingly.



This results in up to 40% electricity savings while maintaining listeners' comfort and service area.

Another major impact of SmartFM is to reduce the average heat dissipation of the transmitter itself. Consequently, the cooling system's electricity consumption is reduced proportionally to the heat reduction.

For example, the efficiency of a 10kW FM transmitter on the market is about 74%, which means that the direct electrical consumption is approximately 13kWh, 24/7. Total electricity consumption to feed one 10kW FM transmitter during one year is then estimated at 120MWh. With SmartFM, total consumption for the exact same system drops by 10% to 40% – a maximum reduction of 50MWh per year for a 10kW FM transmitter.

To help radio broadcasters reduce the electricity consumption of their FM transmission network and improve their carbon footprint, the industry must rethink the whole concept of radio broadcasting and continue to find new ways to innovate.







Temple Bright LLP AI and Intellectual Property – The Latest UK and EU Law

Jeremy advises UK and international business clients on brand strategy, intellectual property rights and disputes, and data protection law, at UK law firm Temple Bright.



Jeremy Morton
Partner, Temple Bright LLP

AI can write music, understand natural language, analyse vast data lakes and make inventions. Legislators and policy makers around the world are starting to grapple with what this means for copyright, patents and other intellectual property, and for developers and users of AI systems.

At the heart of these developments lies the adaptive and autonomous nature of AI. 'Adaptive' means that AI needs no pre-programmed instructions: it learns as it goes along, based on training data, and its subsequent methods are not always transparent. 'Autonomous' means that AI can execute decisions without human command and control.

Access to Data for Training

Data for AI training includes text, images and other content likely to be protected by copyright and (in Europe) database rights. Loading these into computer memory requires permission from underlying rights holders and may be a breach of access terms. That is so whether data have been scraped from web pages, or licensed to subscribers. In the latter case, the licence does not necessarily allow uploading for AI training purposes.

Currently, in the UK, there are limited exceptions to copyright where copying is for non-commercial research purposes, and no exception at all for

database right (which protects non-copyright collections of data). Even the express copyright exception is unhelpful for AI training, because that will usually be commercial.

EU law deals more generously with this kind of 'text and data mining'. Commercial mining is allowed, as an exception to both copyright and database right, although the organisation must already have lawful access to the material (for example, under a subscription arrangement). Rights holders can exclude materials from access, except in the case of research organisations or cultural heritage institutions conducting scientific research.

A recently proposed EU Data Act also makes clear that data produced from operation of machinery of any kind will not be protected by database right, and must be made available to aftermarket service providers on fair, reasonable and non-discriminatory terms.

To redress the imbalance in the UK, the government recently finished a consultation exercise, concluding that a new exception for text and data mining should be introduced. The new exception will cover both copyright and database right, and apply for any purposes. Rights holders will not be able to opt out. Having said that, there will be a requirement for lawful access to the material in the first place, so rights holders can choose not to make their content available either at all, or unless a fee is paid.

Outputs of AI – Creative Content

In 2011, photographer David Slater set up a camera in the Indonesian jungle, a monkey took a great selfie that went viral, and an unusually exotic copyright dispute flared up. Fast forward to the age of AI and we see similar issues.

Under European law, necessary originality for copyright purposes can come from making creative choices (photographic subject-matter, angle, lighting, and so on) or just 'being in the right place at the right time', and it does not matter who (or what) pressed the button. On the other hand, mere ownership of the camera (or other equipment) does not confer ownership of copyright, unless an applicable contract says so.

UK copyright law has long recognised that computer-generated works with no human author can attract copyright protection. This contrives the 'author' or 'designer' to be the person who made the necessary arrangements for the work to be created. 'Person' here includes a corporate entity, and is quite likely to be different from the person designing the software or system.

Computer-generated works have to be distinguished from works made using a computer system as an aid, where the human is indeed the true author or designer. These distinctions will not always be straightforward when it comes to using AI systems for creative projects, however.

Outside the UK, most countries view computer-generated copyright works as contrary to the essential principle of 'originality'. As a result, they are much less likely to be protected by copyright. An example is Dr Stephen Thaler's failed attempt to register US copyright for a work authored solely by the 'Creativity Machine' AI system. (The relevant USPTO guidelines also, incidentally, clarify that works supposedly created by divine or supernatural beings will be refused...)

The UK government has announced that our current protections for computer-generated works incentivise investment in AI, and there are no plans to make changes.

Deepfakes and Marketplaces

AI that controls presentation of sales offers, via online marketplaces or IoT, could have an impact on trade mark law constructs such as the 'average consumer' and 'likelihood of confusion'. These are complex points, and the government feels that AI is not yet developed enough to have a meaningful impact in this area.

AI also opens the possibility for simulated likenesses of deceased or retired performers, and false attribution of speech and actions to non-consenting individuals. The UK government has not drawn clear conclusions on how to deal with this, although it says it may not be best left to intellectual property laws to resolve.

Inventions by AI

Dr Thaler (see Outputs of AI, above) is also famous for attempting to obtain patent protection for AI-generated inventions, with the AI system named as sole inventor. DABUS (Device for the Autonomous Bootstrapping of Unified Sentience), an AI system, autonomously developed inventions that included a container lid and a warning light.

No patent office has denied that, if Dr Thaler had filed the patent application naming himself as inventor and applicant, all would have been fine. In other words, there is nothing preventing the patenting of inventions made by humans using AI tools. What they rejected was the suggestion that an AI system could properly be cited as sole inventor,

and that Dr Thaler could then claim title merely through owning the system that, he said, made the invention without his involvement. Appeal courts in England, the EU, the US and Australia all took a similar view.

Whilst the outcome was perhaps not a surprise to many patent lawyers, there remain some difficulties in fitting inventions by AI systems into patent law. For example, what kind of involvement in the activity of the AI system should entitle a business to file a patent application in its name? In practice, where multiple entities are involved, this should be dealt with by contract. Secondly, if a system would inevitably have produced that output, is it actually inventive at all?

The UK government recently published its conclusions on patents for AI-generated inventions, following public consultation. There was concern that a proliferation of AI-generated inventions, concentrated among a few dominant industry players, could disadvantage SMEs. The government saw no need to change the requirement for a human inventor to be named on patents. It also considered, but rejected, expansion of 'inventors' to include those who perform programming, input data or select outputs based on commercial value. Most respondents to the consultation felt that any changes in this area will need to be harmonised internationally, and that AI was not yet developed enough to make a real impact on the concept of inventorship. No doubt this will be reviewed in the future.



The reality is that even near-perfect 99.99% ('four nines') playout reliability means a statistical average of about an hour of downtime a year

Planetcast International

Looking to the cloud for playout disaster recovery that makes sense

A number of headlines in the press over the last year have spotlighted the dangers of playing fast and loose with video playout Disaster Recovery (DR) protection. But providing the protection broadcasters and other media services need is not a simple – or inexpensive – task.



Venugopal Iyengar
COO Digital, Planetcast International

Video content today is delivered through playout platforms across DTV, cable, satellite and, increasingly, over-the-top (OTT) services to billions of viewers. The requirements and, increasingly, outright demands of audiences using an array of devices and platforms mean that modern playout systems' sophistication is evolving rapidly. Today, playout is a multi-staged process linking a number of systems, including media asset management (MAM) for storing and preparing content, playout core and distribution platforms.

These connected systems handle various stages, including compression, format conversion and layering of dynamic overlay content, to deliver engaging viewer experiences with the expectation of unparalleled reliability. They are the bedrock on which modern broadcast and linear over-the-top (OTT) channels have built their ability to reach and maintain their audiences.

Disruption is not always avoidable

Despite high levels of resiliency, it is a fact of life that playout systems fail. Disasters such as fire, flood, or the accidental cutting of power or critical cabling can and do cause outages.

For instance, in October 2021, multiple UK channels suffered major disruptions in playout services due to a fire-related incident at a central data centre. The outages ranged from relatively minor issues – such as loss of voiceover and graphics on certain segments – to complete loss of programming, advertising and related digital content. The outages' duration depended on the various services' DR capabilities. This downtime ranged from a few minutes to around four hours in the worst cases.

However, even 10 days after the outage, several channels were unable to restore access services such as subtitling –

and still experienced issues with video and audio quality. And outages are not just restricted to DTV. For example, in December 2021, one of the UK's largest pay-TV operators experienced a loss of all of its TV channels, impacting viewers for hours.

The problem is that even with the extreme levels of resiliency that broadcasters use for playout, disasters – whether natural, accidental or technical in origin – can simply overwhelm a playout facility. The reality is that even near-perfect 99.99% ('four nines') playout reliability means a statistical average of about an hour of downtime a year. Even where there is a disaster recovery plan in place, often DR services aren't tested regularly, so when needed, they sometimes don't work as expected – if at all.

In addition, the sheer cost of creating a fully redundant playout infrastructure is prohibitive for many broadcasters, many of which operate in a highly cost-competitive environment. However, when the worst-case scenario occurs, the cost in direct revenue loss through advertising, severe reputational and brand damage, plus failure to meet public service obligations – required by government regulation in some cases – can be devastating.

The unfortunate truth is that no matter how skilled TV staff are, occasional TV broadcast outages are inevitable without truly independent, ready-to-activate disaster recovery in place. It is not a case of if but when...

The benefit of cloud-based DR

So how can media companies protect themselves in a way that makes business sense? On the surface, the solution is simple: deploy DR for playout and test it frequently across a number of likely failure scenarios to ensure it works.



Traditionally, a full active/active on-premise DR set-up that has replicated the playout infrastructure – running in another geographic location ideally – has been one way to ensure resiliency. If you lose one site, then all of the workload moves to the other site.

As discussed, the drawback has always been cost – especially for smaller and Tier 2 and 3 broadcasters. But drill down to the details and it becomes clear that finding a DR solution is more critical than ever. In the past, a cost-benefit assessment could rationalise that losing a projected one hour a year of DTV to local TV audiences could be deemed acceptable. However, the increasing complexity of playout plus the growth of linked services such as OTT and international distribution agreements means that the impact and cost of such events has grown exponentially.

At the same time, over the last decade, advances in technology and virtualisation mean that, today, it is possible to deliver playout directly from the cloud. Media companies are increasingly moving parts of their playout to the cloud – non-core channels for national broadcasters, for instance – to give them more flexibility and rapid scalability for extended coverage of sports and entertainment events.

It is also feasible to create a complete playout solution in the cloud – with full content replication ready to spring into action in the event of a primary playout failure. In other words, thanks to advanced cloud playout technologies, it is now possible to offer a broadcast-grade DR solution with minimal recurring costs when the service is not activated. In simple terms, a complete playout DR solution is deployed and managed for a negligible fee until it is activated.

How does Cloud-based playout disaster recovery work?

A cloud playout DR solution includes three core elements as it is operated by Planetcast International. The first is a cloud-based MAM system that is always on and resides within the cloud that receives programme schedules and content. This element is linked to the second, which is a full-featured cloud-based playout platform. When activated, this playout sends content to the third element, a secure internet stream delivery service, as well as a broadcaster's distribution provider – or redirects content to an alternate distribution provider if needed. The result is a complete and highly resilient service.

Perhaps, most crucially, if a provider offers a 'pay-as-you-use' cloud DR solution, it has virtually no running cost when not in its playout mode. The full cost of cloud playout should only kick in when activated. The cloud DR system should be integrated as part of an 'out-of-line' deployment that requires no changes to existing playout systems or workflow. This approach is crucial to streamlining deployment and means that the system is truly independent of the existing playout chain – making the backup feed more resilient to related failures.

What's more, this cloud-based approach enables media companies to scale up DR as they grow and add new channels and services that also need to be protected. Lastly, the solution should be spun up monthly to do an active playout resiliency test to ensure it is able to deliver services as expected.

Taking action using a proven provider

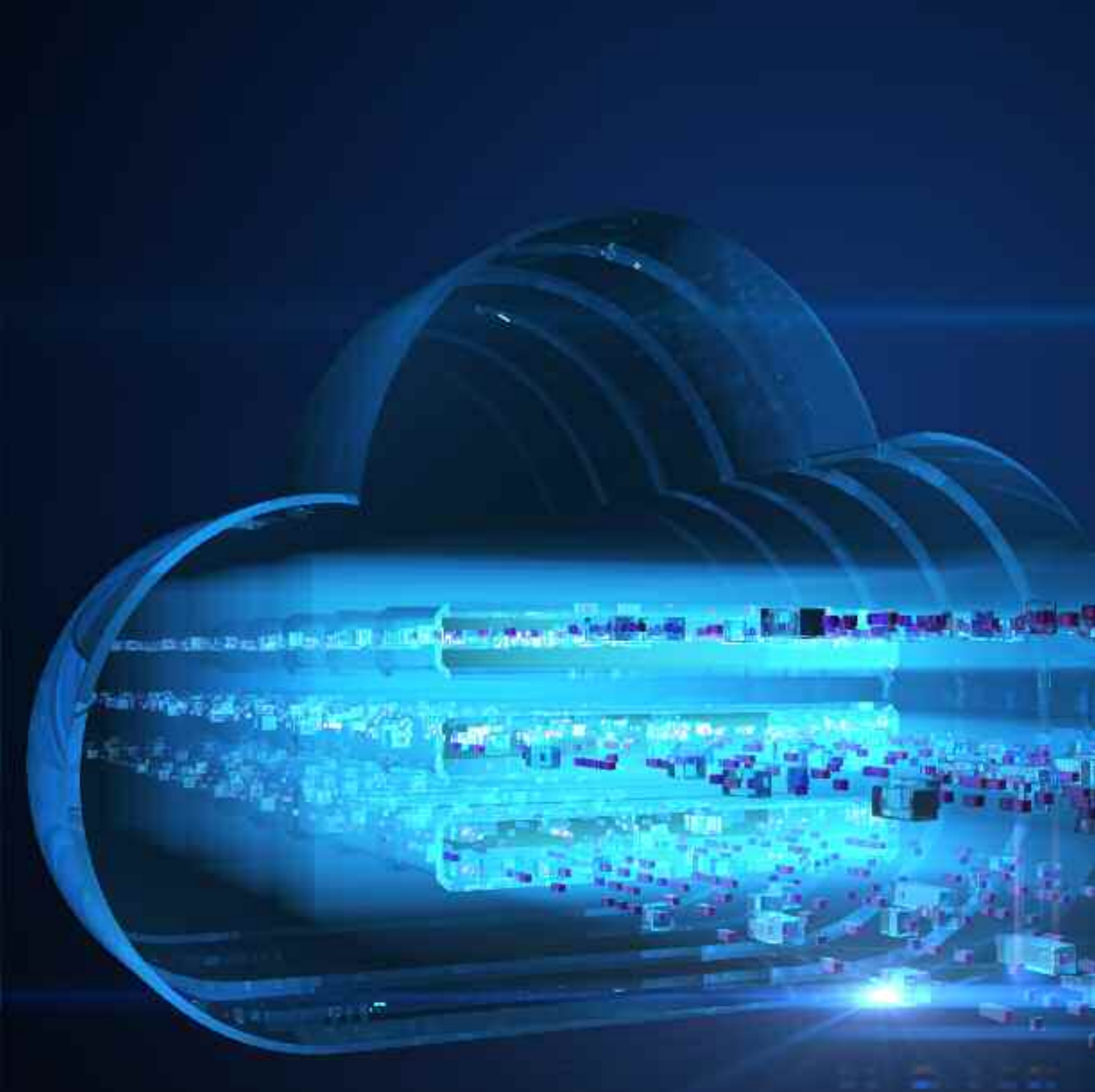
It is essential to recognise that this approach to playout and disaster recovery works best when it uses proven and established cloud-based platforms, and each deployment is delivered based on each client's unique requirements. The disaster provider has to have the expertise, experience and depth of technology and staff to ensure it can do that – and keep doing it consistently and well, even as the client's systems and business models evolve.

It is vital to remember that a cloud DR programme needs to be separate, secure and independent, whether it is to protect an onsite playout environment or supplement an existing managed playout service. That way, it will keep broadcasters on-air if the worst-case scenario should occur.

It is also worth noting that the shift to IP infrastructure is fundamental to enabling effective disaster recovery today. If your infrastructure is SDI-based, you can't virtualise or design a cost-effective multi-facility architecture, let alone harness the cloud-based workflows required to achieve a best-in-class disaster recovery position.

Finally, media brands should view the adoption of cloud-based DR as part of a broader, ongoing journey of the whole business toward the cloud. For use cases such as pop-up and language-variant channels, cloud-based playout often makes more financial sense than heavy investment in on-premise alternatives. The flexibility and scalability of cloud-based playout not only helps enable cost-effective DR and new services but, as part of a broader hybrid architecture, it improves overall business agility.

To download the complete solution paper from Planetcast International on this topic, entitled 'Resetting the economics of media disaster recovery', [click here](#).



Opinion

Net Insight The future of broadcasting is hybrid



Per Lindgren
*CTO and Co-Founder,
Net Insight*

Cloud and IP technology have been transforming the media industry, enabling new levels of innovation and revolutionizing traditional workflows.

From remote and distributed production to the use of Artificial Intelligence (AI) and Virtual and Extended Reality (VR/ER), cloud and IP empower media companies to deliver high-quality and powerful viewing experiences that engage audiences across platforms.

The media industry is highly competitive and diverse with players having different business needs and following their own innovation journey. To be truly impactful, innovation needs to stay relevant. This means the media world needs the flexibility to leverage on-premise and cloud workflows in a complementary way. Given the level of investment in innovation and the need to continue to utilize existing hardware, the future of broadcasting is hybrid.

In this hybrid broadcasting environment, media organizations must be ready to deliver compelling live viewing experiences overcoming the latency, synchronization, and security challenges.



Leveraging on-premise and cloud

When it comes to transitioning to IP and the cloud, there's no 'one size fits all' approach. Every media company has its own unique set of business and operational requirements that need to be met at the right pace for the transformation project to be successful. In addition, every industry player has its existing technology infrastructure and removing it altogether in favor of transitioning to cloud workflows is often unrealistic and costly.

A hybrid broadcasting environment addresses these challenges efficiently by enabling media companies to benefit from their existing CAPEX investments for their core traffic needs, including 24/7 contribution and distribution for linear TV. Cloud workflows have a key role to play when media companies require additional networking capacity for occasional use. This includes the traffic peaks accompanying popular live events. This additional cloud-powered capacity brings the flexibility and scalability media organizations require to spin network resources up or down depending on actual needs rather than having to invest in infrastructure that is only used occasionally. Cloud workflows also

allow broadcasters to replace satellite-driven content contribution and distribution. Sourcing additional capacity from the cloud allows media companies to overcome the limited C Band satellite bandwidth available to the media industry. Finally, a flexible and transparent cloud pricing structure means media organizations can benefit from the economics of the cloud and plan and manage their costs, knowing exactly when and what they will be charged for.

Hybrid workflows will dominate the media and broadcasting industries for the foreseeable future. To fully reap the benefits of cloud technology, media companies need the right synergies with their CAPEX investments as and when it makes sense.

For this traffic mix to succeed and work seamlessly, industry players need the right media platform to enable a hybrid architecture that supports all types of traffic mixes – including core and occasional. The media platform needs to be open, flexible, and standards-based to

support all on-premise data centers and cloud providers. In addition, the platform needs to be compatible with the full range of protocols available in the market, including RTMP, SRT, RIST, Zixi, and support protocol conversion as necessary.

The latency and time synchronization challenges

Latency and time synchronization are critical parameters in live cloud production to ensure high-quality video delivery and seamless viewing experiences. To put this in context, remote production has the most stringent latency requirements with the maximum latency being typically 100-150 milliseconds. For other live production workflows, the contribution latency needs to be below 1 second end-to-end, including encoding and decoding. The media traffic is sensitive to jitter and requires the content to be sent and received with the same clock (pace). In addition, for high-tier live events (i.e., Tier 1 and 2) with multi-camera productions, synchronization is key to ensure frame alignment and compensate for any network delays. For this to happen, the source and destination nodes should use the same clock.

However, in IP environments, transferring time can be challenging. To solve this problem, it is important to ensure clocks are configured correctly on both sides to avoid frame misalignment and overall poor quality.

Addressing security, IP domain management, and flow control

Network security, IP address domain management, and media-related flow control are key considerations when moving to end-to-end cloud production workflows. When moving to the cloud, media traffic switches between local and public IP networks and different IP address domains. Therefore, it's important that media platforms are able to handle translations at edge points (for instance, when moving between the IP address domains of the venue, cloud, and studio). All data, audio and video will enter the different domains over the same network links and ports. As a result, it's crucial to ensure the type of IP media traffic can pass through these networks and which streams can go in and out of each network domain. It's important to remember that even 'secure' IP media traffic can cause serious issues. If the content isn't configured properly, it can flood the network and cause packet loss, jitter, and delay. Media companies need full control of content filtering in their IP media networks and services to ensure these types of vulnerabilities are eliminated.

Securing cloud workflows and IP media networks has typically relied on the combination of general-purpose, media-unaware firewalls and to a certain degree Network Address Translation (NAT) capabilities. However, these solutions are falling short as they don't deliver the capabilities and performance required to handle the number of streams and data in large IP media networks.

An IP Media Trust Boundary supporting ST 2022 and ST 2110 workflows brings new levels of security married with unparalleled

speed, low latency, and efficiency. The IP Media Trust Boundary automates traffic filtering of incoming and outgoing IP addresses and ports per stream and per core application. Through user-selectable metrics, media companies have the control to define which data and streams are allowed or blocked.

This covers transferring content in mixed IP environments and between trusted and untrusted IP domains. The IP Media Trust Boundary does not simply bring unprecedented levels of security but also delivers flexibility and scalability. The NAT functionality allows for the removal and reapplication of the full IP layer, creating a tamper-proof seal while enabling the full reuse of IP addresses and dramatically simplifies the move between multicast and unicast networks and IP media devices.

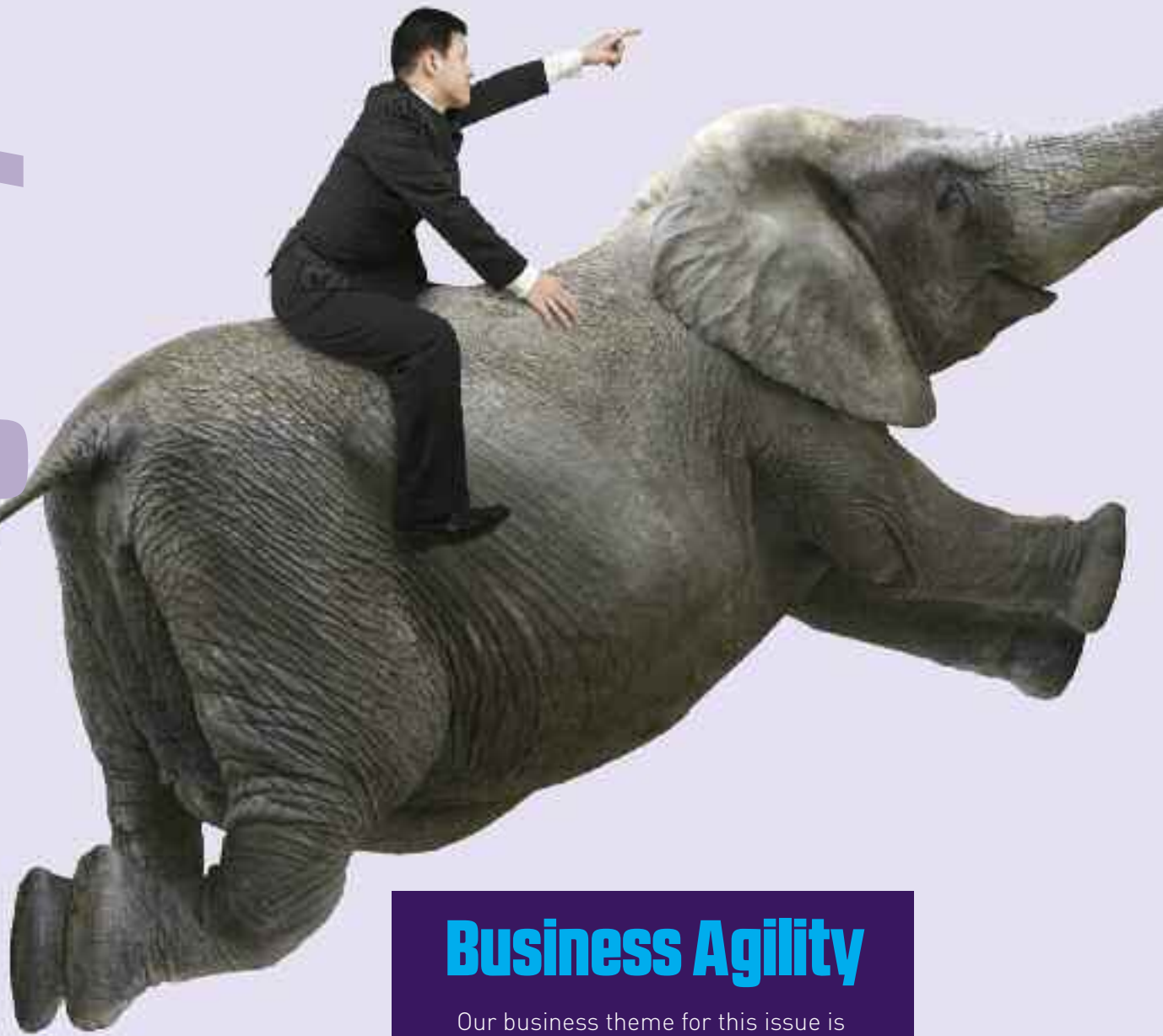
A platform for a hybrid future

Cloud technology is revolutionizing how the media industry produces, handles, and distributes live content. The cloud brings the agility media organizations need to deliver the types of content consumers require on all the right platforms. However, the flexibility brought by the cloud should also be translated into how media companies transition to these innovative workflows – they need to be able to move on their terms and at their pace.

Hybrid workflows will dominate the media and broadcasting industries for the foreseeable future. To fully reap the benefits of cloud technology, media companies need the right synergies with their CAPEX investments as and when it makes sense. The success of hybrid broadcasting environments depends on overcoming the challenges of latency, time synchronization, and media-related flow control and security. An open and flexible cloud media platform provides the critical capabilities media companies require to define their own path to live cloud production workflows.



Business Agility



Business Agility

Our business theme for this issue is Business Agility – an absolute essential in this age of constant change and development as the breadth of articles in this section clearly shows. Business Agility includes automation, intelligence, supply chain management, human capital management and working methods.

Actus Digital

Gain business agility, be faster and save human costs with your monitoring system

Any business is striving to be more agile, reduce operational costs, optimize performance, and speed up processes, while understanding that business process automation eliminates the bottlenecks that lead to lost time and revenue.

One way to achieve this is to have as many automatic workflows as possible that not only allow faster results, better response time, and better accuracy but also save human capital and eliminate mistakes. Furthermore, the AI engine development in the last years has contributed significantly to workflow automation and intelligence, allowing cost reduction, productivity, availability, reliability, and better performance.

You may ask how a compliance and monitoring platform can make your business more agile. The answer depends on the use cases and workflows the monitoring solution offers. Actus Digital is a good example.

Let us take a few examples and see the ways Actus Digital compliance and monitoring platform is assisting with these goals.

Creating the VOD library automatically

Creating VoD libraries can be a time-consuming process. It requires monitoring each and any program, removing all the ads by multiple marks in and marks out manually, adding logos, effects, metadata, selecting the subtitle, the audio languages, converting the content to the desired format, selecting the destination, etc. Many of these actions have to be done repeatedly, which is a time-consuming process, including the probability of possible errors. This is more extreme when there is a large volume of content to deal with that will require enormous manpower. An automated process, that is included in Actus Clip Factory PRO solution, eliminates the possibility of errors based on human restrictions, speeds up the process enormously, improves accuracy, and of course,

lowers the operating costs. Furthermore, it improves the ability to be more competitive since your content will be ready on your VOD platform much faster.

AI provides flexible and powerful media and content monitoring

Searching, analyzing, and cataloging quickly and effectively a large volume of content and finding specific spoken topics or particular people, or being able to search for content in different languages all need the integration of different AI engines into the daily workflows. It is needed to identify trends that can be used for various reasons such as political, news, commercial, and scientific purposes.

The integration with AI engines (offered by Actus AI module) such as speech-to-text, face recognition, and translation allows immediate audio and video analysis, crossing the boundaries of languages. For example, think about a process that requires speech-to-text. The result also has to be translated into another language. Such a task would require a different type of expertise, coordination between different systems, and time.



Not only can you search for specific topics or specific people, but you can also create your own list of relevant topics or information, be automatically alerted when relevant audio or video is aired, or have the relevant clips created automatically. It saves human resources; it is accurate and immediate, allowing you to immediately be exposed to the information you need and respond accordingly. When it comes to news monitoring, exporting content to the new media platforms on the spot, or learning about political trends, it is crucial to be fast exposed to the information.

Intelligent competitive analysis

Another example of AI-based automation is a more effective and fast competitive analysis. The ads are a major source of revenue for any TV network and the content owner. Therefore, the ads' sales teams are constantly striving to increase the ads' airtime and prove higher rating results. Using an AI for automatic ads detection (such as Actus Adwatch) allows you to automatically track the aired ads on your and competition channels and get automatic reports on ads aired at the competitive channels but not on yours. For example, get an automatic report in cases when specific ads are aired more times on your competitive channels. Getting this information manually is unrealistic as it will take endless manual work, will not be accurate, and more importantly, it will not allow fast response time and taking the necessary action.

To summarize: automation and AI integration reduce the necessary time, increase the production output, can work unattended 24 x 7, increase productivity and efficiency, eliminate human errors, improve accuracy, allow the creation of more complex workflows, save human resources, and bring faster results.

About Actus Digital

www.actusdigital.com

Actus Digital is the world's leading and global supplier of compliance logging, intelligent QA monitoring solutions addressing a multitude of requirements for media companies and business enterprises. Since 2005, hundreds of customers have chosen Actus Digital to help them affordably improve quality, comply with regulations, and automate the analysis and repurposing of content.

Reliable 24/7 content recording from a variety of inputs from baseband (like SDI, HDMI, etc.) to transport stream (including ATSC/ATSC 3.0 via antenna, IP, ASI, and QAM) and IP (such as SMPTE ST 2110, HLS, MPEG-DASH, and RTMP) with multiple audio and caption tracks allow Actus Digital customers to address both linear-broadcast and OTT needs.

Online and software-based multiviewers display any combination of channels with must-have compliance logging for things such as missing closed captions, DVB subtitles, and loudness violations. Additional engineering features for things like SCTE 35/104, NAVE detection, TS analysis, and many quality assurance alerts are all part of the standard Actus Digital platform.

Other advanced features including graphical ratings next to video competitive analysis, integrated playlist to as-run log discrepancy reporting, advanced clips creation for content repurposing and social media, and AI-enabled content detection and speech-to-text, address cross-organizational use cases. Actus Digital has offices in the USA, Europe, and Asia, ensuring worldwide 24/7 support.

Agama

Plugins – The Core of Successful Device Integration

In the past decade, enterprises and software providers were looking for solutions on how to easily integrate new devices into their ecosystem, while keeping their legacy systems and infrastructure. Pre-integration and automated integration help to overcome current obstacles and to steadily build knowledge required to succeed.

Over the years, providers have dealt with all kinds of projects, some small but others quite large. The idea of plugins came up to handle the complex integrations of large projects, which was then extended to any project size. Plugins are smaller, easier to manage, and easier to integrate into larger structures, without the need of re-writing the same thing all over again.

One of the key parts in understanding the satisfaction of your users is to assess the quality of experience for the services they consume, their engagement, the type of content they like to watch etc.

The implementations of these important KPIs historically included, among others, an agreement on the desired metrics set, an investigation of the available metrics in the target platform, and an integration of these metrics towards a core agent. A lot of these steps were unique for every integration. This was partially due to different wishes from different customers, but mostly due to the unique characteristics of each of the target platforms.

With the growing popularity of OTT platforms and the rise of players such as ExoPlayer, Shaka Player or AV Player, the target platforms became increasingly similar between integrations. The shift from 'everything is custom' to 'common platforms and players' enabled some integrators to step outside its domain. They started actively investigating players and platforms, gathering knowledge

about them, assessing what could be possible and feasible and defining an absolute base of metrics that would benefit every customer. These are all implemented in what is called 'player plugins'.

Player plugins follow a few basic principles:

- The plugins provide a good set of metrics, making them directly usable
 - No specific knowledge required for plugin integration – just a few, stable APIs are necessary
 - Ability to pass custom metrics to the plugin
- The trend is to have player plugins for most of the popular players, such as ExoPlayer, Shaka Player, AVPlayer, and for platforms such as Android, FireOS, iOS, tvOS, Chromecast, Browsers, WebOS, Tizen etc.

While the complete list of metrics differs slightly between plugins, they all share most of the metrics. Some of the features they have in common are:

- QoS and QoE metrics
- Device properties
- Ability to understand asset consumption
- Ability to understand playback errors (for instance, DRM errors)

ExoPlayer is currently one of the most popular players for Android. It is extremely customizable and flexible, yet easy to start with. Therefore, it comes as no surprise that it is used by everyone, from hobby enthusiasts to video operators and even YouTube.

There are some requirements and dependencies that are needed to use plugins in the first place. Players evolve quickly and so do their capabilities and APIs, for example ExoPlayer.

Some metrics implemented by a plugin can be subject to platform permissions. These are not critical to have in any sense, but more on the good-to-have side and will only be included if permissions are granted. Also, related to privacy issues, plugins can be configured to skip certain sensitive metrics. Such information can be, for example, the collection

of the device's longitude and latitude position. Lastly, the plugins are to be included in the project as any other 3rd party library.

To conclude, plugins are the modern way to integrate new devices into existing systems, which in many cases are based on a legacy infrastructure. Instead of sizing up a system that is already difficult to maintain due to its legacy components, plugins can help this setup and minimize the costs of modernizing the existing platforms without investing into costly new complete solutions.

```
String agamaConfig =  
'emp_service=https://cdml.company123.se/report;report_in  
terval=60;id_report_interval=240;operator_id=fooSoo';  
String appName = 'Company 123 Play App';  
String appVersion = '2.1';  
  
// Initialize the plugin  
EmpStats.getInstance().init(agamaConfig,  
    Definitions.LogLevel.DEBUG,  
    appName,  
    appVersion,  
    ExoPlayerLibraryInfo.VERSION,  
    getApplicationContext());
```


Amagi

How the latest cloud technology is revolutionizing linear and non-linear channel playout

Gone are the days of traditional content delivery technology. While in the past, content owners have had to rely on a chain of complex hardware to enable playout and control solutions, now, they are turning toward a cloud-based architecture to deliver content with greater simplicity, cost-efficiency, scalability and reliability.



Srini KA
Co-Founder, Amagi

Indeed, to thrive in today's competitive streaming environment, cloud technology is an absolute necessity. As the industry continues to evolve at a rapid pace, it demands not only more efficient workflows, but also more affordable ways to deliver high-quality content to audiences worldwide.

So how has the cloud impacted the media landscape and what benefits does it offer to broadcasters and streaming providers alike? Let's take a look at a few of the ways cloud technology is revolutionizing playout for broadcast and OTT channels:

Flexibility alongside broadcast-grade quality

With the cloud, broadcasters and streamers can spin up/ down channels on the fly in just hours – allowing for rapid scaling in response to audience demand. Want to launch a pop-up channel around a live event? Done. Need to close a channel that's not seeing adequate reach? Also done.

And this level of flexibility doesn't mean sacrificing on quality. Not only does cloud enable content owners to

deliver channels over satellite, fiber, or IP, it also ensures top-of-the-line playout for both 24x7 linear and VOD channels. Whether via Free-Ad Supported TV (FAST) platforms, native apps, or broadcast channels, organizations are able to efficiently deliver content, graphics, captions and metadata in up to UHD resolution, all while minimizing implementation and operational costs to enhance revenue.

Automated playout management
Unlike traditional playout systems, cloud technology enables

automation for more effective playout management. Processes such as playlist generation, quality checks for configurable parameters, scheduling and monitoring no longer have to be manual, time-consuming efforts. With cloud-based automated processes, content owners have the ability to manage hundreds of feeds and scale up or down at will with ease.

What's more, cloud technology even enables automated dynamic ad insertions – selecting the optimal ads based on the viewer and the





content they're watching – as well as advanced graphics placements. With an automated process that incorporates graphics from media databases and playlists, along with asset metadata, into channel layouts, content owners can achieve dynamic effects, faster and more efficiently than ever.

End-to-end workflow functionality

Today, comprehensive end-to-end workflow functionality is a baseline for every media company to keep pace with their competition. Fortunately, cloud technology makes this possible, providing everything including seamless media ingest from multiple sources, content management, scheduling, playout, captions support, advanced graphics insertion, ad placement and monitoring – increasing efficiency while reducing complexity.

And, as content owners today need to serve a global audience, they must also be able to centrally manage multi-country feeds. This is, again, where cloud-based playout becomes a necessity – able to deliver content directly to operators using remotely managed cloud playout. In other words, cloud delivers media anytime and anywhere it's needed, for ultimate efficiency.

Superior performance and reliability

One of the biggest benefits of cloud-based playout is its built-in reliability. Cloud solutions automatically back up media assets, so there's no need to spend additional time or resources to ensure channels continue uninterrupted in the face of disruption. Effectively, the cloud is disaster-proof, enabling organizations to

implement the right level of redundancy for them to make sure their channels never go down.

Regardless, disaster scenario or no, cloud guarantees a superior level of performance, offering low latencies and high-quality HD/UHD video. What's more, many cloud solutions provide a unified dashboard for users to view all their data in one place, remotely, for improved monitoring, analysis and real-time decision making.

Competition for viewer attention has never been higher. The streaming wars are heating up and, with a possible recession on the way, media companies need to capitalize on every possible opportunity to capture and grow their reach – or get squeezed out of business. With the advantage of cloud-based playout and control solutions, broadcasters and streaming providers can not only offer rich, optimized content experiences and reliable, disaster-proof service at scale, they can also lower their cost of operation – and pass that savings on to their customers to help cement loyalty while boosting revenue.

Reach out to Amagi to see how Amagi CLOUDPORT, an award-winning cloud-based channel playout platform, can work for you: cloudandme@amagi.com

Srini is a technology entrepreneur with 23+ years of experience in establishing and successfully scaling businesses. Srini co-founded Amagi in 2008 and established it as a global leader in SaaS for broadcast and streaming TV on the cloud. As the Chief Revenue Officer of Amagi, Srini is responsible for revenue growth, inclusive of sales & marketing

AMD Xilinx

Expanding into pro AV using IP networks

AV-over-IP, or the transport of audio, video and data over an IP network, has enabled a seismic shift in how broadcast equipment is built, deployed and used. We're in a transition from capex to opex models in broadcast. Moving from specialised units for media processing, to high performance hardware platforms which can be repurposed on-the-fly to support single or multi-channel AV processing and routing, and on to virtualized media applications which can be provisioned and paid for only when you need them.



Rob Green
Senior Manager -
Pro AV, Broadcast &
Consumer, AMD Xilinx

But the AV-over-IP story needn't stop there. It can also offer a way to expand your business into the world of pro AV. A separate entity to broadcast, pro AV covers a much larger available market (figures 1 & 2), including live events such as music performances, theatre, conferences etc., government, control rooms, education, high-end residential, retail signage and displays, and more. These trends are driving demand for adaptive computing solutions that provide the necessary flexibility to deploy and redeploy pro AV technology for a wide range of use-cases.



Figure 1 - Broadcast market (source: AMD Xilinx estimate)



Figure 2 - Pro AV market (source: AMD Xilinx estimate)

Other differences include the use of connectivity standards such as HDMI™, DisplayPort™ and HDBaseT™ rather than SDI. It's a more cost-sensitive market and is also fragmented today with many manufacturers offering limited interoperability because they historically owned both ends of the AV link. The need for technical robustness and tight synchronization is there, but currently much less rigorous than broadcast. Generally, pro AV installers and users are adopting similar types of equipment to what you're probably already building for broadcast.



Figure 3 - NDI demo

The opportunity to expand

The pro AV market is undergoing a transformation and experiencing a shift to IP networking. Just like broadcast suffered through the times before SMPTE ST 2110 was chosen as the industry standard, the pro AV market has entered a frantic period of competitive positioning with various flavours of AV-over-IP standards and protocols such as IPMX, NDI®, SDVoE™ and Dante™. Each have pros and cons, and all claim to be the best. However, the widespread use of reprogrammable hardware such as FPGAs (field programmable gate array) and adaptive SoCs (system on a chip) and new software-only implementations means that equipment can adapt to different standards as needed, and bridge between them depending on use case.

As a broadcast supplier, it's possible to take advantage of some of the cross-over technologies to expand the footprint into the larger pro AV space. For instance, IPMX (IP Media Experience) is an emerging networking standard from the AIMS Alliance, which is built on SMPTE ST 2110. It uses the same techniques as ST 2110 to packetize audio, video and data, JPEG XS as the main compression codec (for now), and NMOS (Network Media Open Specifications) for a standardized control plane. For pro AV, it adds extra functionality for handling HDMI features and offers PTP (precision timing protocol) and

non-PTP methods for synchronization. Most organisations in the broadcast space probably already have, or are developing an ST 2110 system, so it's not a huge stretch to adapt that platform to also support IPMX and be integrated into many pro AV systems requiring similar audio/video processing functionality. IPMX is of particular interest in pro AV right now because it is the only truly open standard – as well as being scalable and interoperable, it is entirely vendor-independent. This means that you can build your own implementation of IPMX without waiting for a particular manufacturer's device to support it or being beholden to any changes made by a single company without having any control over it. It also means that IPMX can scale to support any resolution of AV and isn't fixed to a single Ethernet bandwidth such as 1GbE or 10GbE.

Building bridges

IPMX is not the only way to use IP protocols to bridge the worlds of broadcast production and pro AV presentation and collaboration. NDI (Network Device Interface) is hugely popular in studio and remote production facilities because of its ease-of-use. In fact, NDI is already often used to ingest from broadcast PTZ cameras on location or within studios and easily stream them as a source



Figure 4 - IPMX demo from Nextera Video and Adeas

over conferencing software such as Microsoft Teams® or Zoom. It's used for live streaming from corporate events and for vloggers to stream e-sports commentary.

NDI offers broadcast quality AV on any IP network (IPMX will tend to need its own network due to the higher bitrate needs currently), as it is highly compressed compared to IPMX, so it's likely that both will coexist in various environments. Audinate's Dante is another protocol widely used in the professional audio domain for both broadcast and pro AV, and is an example of how IP-based protocols can easily span both markets if they're easy-to-use, offer low latency and high-quality AV. Whilst there are many competing standards and protocols vying for the same space in pro AV, the hardware involved remains constant and is found in most ST 2110 broadcast systems anyway. FPGAs and hardware reprogrammable SoCs offer the ability to switch functionality on-the-fly, support various baseband AV interfaces such as HDMI, DisplayPort and SDI, and Ethernet MACs for the all-important AV-over-IP interface. Most of the IP protocols discussed can target these devices (Figure 3 shows NDI and IPMX), so they

can be programmed as needed, and potentially even form bridges between them. In most cases the real difference between the AV-over-IP protocols is the codec involved, so transcoders can be made to handle any incoming stream as needed.

Making the shift

Of course, the transition into pro AV isn't simply a case of rebadging your product, but much of the technical development work has already been done – providing the opportunity to adopt one or many of the AV-over-IP protocols being considered in that market. A growing number of organisations in broadcast have successfully pivoted some of their product lines to move into the larger pro AV space, and the lines between the markets continue to blur, driven largely by the Covid-19 pandemic and subsequent shift to remote production, live streaming and collaboration. Solutions such as FPGAs and reprogrammable SoCs broadcast manufacturers use today have the capability to adapt should you want to expand your business into pro AV in a relatively low-risk way.

Argosy

Planning and communication are key for successful supply chain management

Argosy have over 16,000 SKU codes listed on our operating system. These are supplied to us by vendors from across the globe, all of which have been affected to some degree by Covid restrictions and global shortages on raw materials, plus the knock-on effect that the war in Ukraine is having on the movement of goods across that geography.



Chris Smeeton
CEO, Argosy

Fortunately, Argosy tends to favour vendors that manufacture their products in the UK, meaning that transit times are generally favourable. This of course also means that we are protected from fluctuations in exchange rates.

The way we place our purchase orders for these products has had to change to secure production space and allow for extended lead-times caused by raw materials shortages. We now often place holding orders or call off orders with our suppliers, that we 'draw down' to align with our usage. This not only secures production space but also allows us to maintain significant stock holdings, whilst managing cash flow in line with the wider objectives of the business.

For goods manufactured elsewhere, we must accept that longer lead-times are now an accepted part of the current landscape. Here, honest and accurate communication between us and our suppliers and through to our customers is key.

Fortunately, these global challenges are so high profile that having such discussions with customers are accepted and trusted and therefore there is not a negative impact on the reputation of the respective companies. In fact, we find this honest dialogue demonstrates our key strength of supply-chain management.

This is not to say that we can't be caught out. We recently experienced a Covid breakout at the factory of one of our suppliers which set back production time on a key product required for a project that had a critical timeframe. Fortunately, our relationship with that customer was strong enough to cope with this but it does make life complicated and uncomfortable for all involved.

Over many years we have championed the need to see our suppliers as true 'partners' and now more than ever, we are proving how we can work together to manage these challenges.

Of course, the current situation is also having an impact on the human element of our business. It has been difficult and expensive to travel to meet with suppliers and customers over the last few years, especially across borders with changeable restrictions. Dialogue has had to take place across virtual platforms and going forward we believe supplier engagement at trade shows will be as important a part of trade shows as the customer contact.

Recruitment and training are also being affected by the current situation. Many staff now work from home some of the time as we adopt hybrid working. This means the time we do spend together is critical for maintaining our team ethos. We also have management meetings each week to discuss issues and plans for the week so that we can share ideas and plan accordingly.

Overall, we see that forward planning, leaner processes and honest communication are the key to overcoming the difficulties being faced.

M2A Media

Our Cloud Approach: How M2A Media is tackling complex workflows for modern, agile broadcast media organisations

The broadcast sector is more fragmented than ever before - on the consumer side with a growing number of streaming platforms, and on the B2B side with the convergence of traditional technologies such as satellite along with newer cloud-based delivery forms. Cloud is widely regarded as being the necessary infrastructure step change by which both B2B content is exchanged and D2C content is distributed. Many premium content providers and broadcasters are already leveraging it and optimising their workloads. Here's how we are enabling broadcast and media organisations globally to automate processes, speed up time to market and deliver superior viewing experiences.



Callum Elsdon
Product Marketing
Manager,
M2A Media

We build our technology on top of AWS Media Services' products such as MediaConnect and MediaLive. We publicly nail our flag to the AWS mast because of the superior foundations offered by the company in delivering for broadcasters and rights owners. The capabilities of AWS products for organisations in the media sector are unrivalled but, to realise the true potential of the cloud, it still requires an automation layer which is where we enter the picture. Achieving scalability in the cloud needs an intelligent automation layer which can be driven easily by operators and without the need for manual intervention by engineers.

Our products are built solely for the AWS Cloud delivering the best experience for the best cloud services for our industry. Dedicating our teams to develop exclusively on AWS ensures new releases of our products interoperate with their products



effectively – and without the hassle of delivering fixes across multiple cloud platforms. Others within the industry may also opt for a multi-cloud solution for claims of greater reliability, but our tried and tested approach with AWS delivers stability. Multi-cloud in and of itself does not ensure reliability but automating AWS services across regions and availability zones (AZs) with effective topology deployed in M2A Media products does. We are

confident in this approach which is why we are dedicated to the AWS cloud.

M2A Media develop two core products, these being M2A CONNECT, for global content distribution and acquisition, and M2A LIVE, our ultra-reliable, broadcast-grade live streaming platform. Our products are driven from the intuitive M2A console which features a recognisable EPG-like schedule for 'booking' new

events which automate AWS. With easy configuration of sources and outputs within the UI, our customers can make the most of the cloud to deliver efficiencies and grow their offering. During IBC 2022, we have introduced our new concept called Add-ons in both products to enable customers to tailor services to their needs and budget, without compromising user experience.

Add-ons within M2A CONNECT include:

- An integrated **Live Capture** feature to record live video feeds to AWS S3 storage for VOD, archive or compliance uses
- Award-winning, motion-compensated Cloud **Frame Rate Converter**
- **Event-based routing** for dynamic distribution of content to takers on an event-basis
- 24/7 Operations for monitoring and the various levels of support for live services tailored to operational and budgetary needs.

While M2A LIVE features the above in addition to:

- **Dynamic Content Insertion** for effective localisation of ads and content.
- Linear-like services with **VOD to Live** allowing customers to create pop-up and FAST channels to further monetise existing content.

The ability for customers to tailor the product offering to their operational needs ensures that they attain the greatest value from their M2A Media products in AWS.

By utilising M2A CONNECT, rights owners can take control of distributing their live event content

across a vast global network at broadcast quality without the prohibitive costs associated with traditional delivery methods. For broadcasters acquiring that content, the automation of AWS can enable them to scale their capacity dependent on incoming events easily without need to invest in permanent bandwidth increases. For both parties in the distribution and acquisition chain, it enables faster time to market and easier integration with existing processes because no new physical infrastructure needs to be deployed. Meanwhile, the ability to use Add-ons allow organisations to further streamline processes into the cloud, such as Frame Rate Conversion or Live Capture, removing the need to host equipment on premise.

Meanwhile with M2A LIVE, broadcasters and streamers enter into a rock-solid reliable platform to deliver their live event broadcasts globally. It's a product that caters to 3 million+ concurrent views consistently week-in, week-out. Integrated with the ability to tailor feeds thanks to Server-Side Dynamic Content Insertion (SS-DCI), M2A LIVE will provide the viewing experience your subscribers expect.

Our products are only the start of getting into the cloud. Since I joined this industry in 2016, it feels as though concepts such as cloud production have been discussed at great length but only now, on the cusp of 2023, does it feel like these are gaining real traction. With transport and delivery automation technology in the form of M2A CONNECT, rights owners and broadcasters can ingest feeds into the cloud more easily for production and transformation. M2A CONNECT acts as the gateway for getting your live event content into AWS to do more than previously was possible outside of the cloud realm.

In a world where viewers are demanding more from broadcasters, rights owners and their live events, the cloud offers the opportunity to simultaneously manage more content, do more with it and increase efficiency of operations. Using the power of M2A Media's products, we ensure the industry can manage the transition to the AWS Cloud effectively in products that are tailored to the needs of our industry. Our products help build modern, agile broadcast media organisations from the ground up, rather than replicate legacy processes that don't work in the modern age.



MISTV

Flexibility and automatization-based business management tools deliver agility and a competitive advantage

By the definition of business agility, we can ascertain that if anything, a successful business must constantly evolve and innovate, to keep a competitive edge. To maintain this pace of progress, many television companies face the dilemma of choosing the most flexible and long-lasting tools for managing their daily operations. Such choices can have a huge impact on their ability to not only organize and air their content, but to also generate good revenue to remain competitive.



Jiří Gabriel
COO, MISTV

This is where Broadcast Management Software (BMS) solutions come in, as they help to acquire and organize content libraries, schedule broadcasting and book advertisements into the broadcasted content. This very large and complex workflow often includes hundreds of employees, managing their respective tasks, with the aim to put together a complete playlist to broadcast to consumers. This puts a tremendous emphasis on precision and due diligence, as mistakes made here are potentially very costly, or alternatively result in suboptimal revenue generation.

As such, it is also the perfect environment for benefiting from automated workflow and constraint-based management systems, to prevent mistakes and optimize booking efficiency. This is the part of business agility that is crucial to success, as any mistake made sets you back, while your competitors storm forward. It also proves that to successfully evolve as a business,



your choice of a management toolset is a crucial step. This is where integrated BMS solutions really shine, as they can be helpful to businesses, when utilized correctly. At the very least, they enhance and streamline the workflow of the TV station, and at their best, they automate large parts of it.

To verify such claims, one can look to the IABM "Media Tech Intelligence – Media Tech Trends" article (<https://theiabm.org/manage-support-content-chain-trends/>),

which shows that NET investment outlook measured the Manage category as increasing by 13% from 2020 to 2021. Within this area, the Workflow orchestration category is the fastest growing area of investment for 2022 (at the time of writing this article, 22.08.2022) and Software development/ Consulting/ System Integration being second only to Cloud Computing.

Brief Summary:

MISTV® Mira is one such software solution for station management, concerned with workflow orchestration (among other things, but we shall stick to the topic at hand). We offer our clients a complete solution for Broadcast, Content and Advertising Sales management, aimed at client-specific needs regarding optimizing workflow. Through over three decades of experience, we have developed solutions that are fully customizable for numerous different markets and their specifics. This allowed us to release MISTV® Mira, a scalable and highly adjustable piece of software, that can accommodate small and large TV stations alike. Utilizing a module-oriented approach, we offer the users a clean and intuitive UX, requiring only simple training sessions to become familiar and efficient with the software. Thanks to the streamlined workflow and autobooking tool, you will be able to reduce costs on operations. The software is delivered as a SaaS license and as such is updated frequently and can be either centrally hosted or installed locally.

Workflow optimization:

To optimize the workflow of an entire television enterprise is no small task. In different countries and their broadcasting markets, there is a great deal of divergence in order of operations and their dependence on other tasks that need to be carried out beforehand. This is why we offer a highly configurable solution, to make it possible to adjust to said differences and take into account any special requirements that may arise.

The traditional steps of the whole process are as follows: Content ingest → database record → metadata control → Long-term planning → On-Air promotion → Daily plan → Advertisement booking → Postlog reconciliation.

This is a very simplified and optimistically linear version of a workflow that is usually managed by multiple facets of the company, usually running these operations independently towards the unified final

outcome of obtaining content, broadcasting it and keeping records of all the properties associated with it. However, this has a major flaw in that the respective departments often need to wait for the completion of other departments' previous tasks. This also often redundantly multiplies workload and data entered.

To optimize this branched-out workflow, we offer an all-in-one solution that helps you organize the content to be broadcasted, add all the metadata you require, and provide an overview of the daily plan (down to single frame precision) to be released. This also includes any services and integrations to upstream and downstream processes that come with airing the planned content. One of the major advantages of this solution is that it allows for the creation of an overarching structure, which means that all individual departments can contribute simultaneously, without the need to wait on one another, while maintaining the integrity of a preset plan.

Once implemented at a TV station, the users undergo training (besides introductory lectures before implementation) in operating MISTV® Mira in their respective fields of responsibility. Because the software can be adjusted via user profiles, there is no need to worry about an overly-complicated interface, as the user can see only the part of workflow they are responsible for, unless they require more (such as administrators). This simplifies the process and helps avoid any potential mishaps. The system guides users through the whole process, highlighting what is mandatory, by aggregating many of the atomic steps into less (and more automated) procedures, reducing the required effort for completing respective tasks, maintaining a high standard of accuracy by keeping the essentials in focus, while taking care of mundane tasks in the background. This also includes vital checks, such as warnings to soon expiring licenses with remaining runs that are in danger of expiring, preventing loss of returns.

Business Agility

We put high emphasis on automatization of step-by-step processes for ease of use, increasing efficiency of procedures, reducing data input necessity, guided data entry for users (via templates and wizard-like processes), easy to use import and export functions supporting various commonly used formats (resulting in reduced workload and knowledge requirements per user), modular report creation from grids and constrain based operations that reduce not only risk of human error in input, but also the need for intervention from out consultants. We also make sure to include the latest technologies in forms of .NET Framework, Oracle Plug-in databases, components and APIs. These factors combined, result in a system that is flexible for any market needs, fast (assuming all hardware specifications are up to par), easy to learn and intuitive, less demanding in terms of manpower, secure, low maintenance and comprehensive in terms of tying the entire workflow of multiple departments.

Summary:

In summary, we are providing the market with a solution that boosts enterprises' content and management capabilities, while cutting costs on manpower in terms of time and money. These are achieved on multiple levels of TV station structure, by providing: a linearly unrestricted workflow for independent departments, automating simple tasks, constraint-based processes, avoidance of human error, reminders of license expirations, user tailored workspaces, streamlined workflow and 24/7 tech support with dedicated ticketing system.

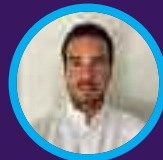


Imagine Communications

A fresh approach to channel delivery and monetisation

It has become almost compulsory to start all media articles with a statement along the lines that life used to be simple with a small number of broadcast channels, and now we have sources which will give us the content we want, when we want it, on the device which is to hand at the time.

That, of course, is true. But what are the practical implications of this change? Most important — whether you are a broadcaster, a streaming service or a content owner — how do you reach your audience, deliver the experience they expect, and make a fair return on the operation?



Ignacio Revuelto Rosello

Product Marketing Manager – Payout, Imagine Communications

If we go back to the traditional channel broadcast for a moment, what were the characteristics? Programmes were transmitted as a linear stream, to a precisely timed and published schedule, with no gaps or crashes between content.

Commercial breaks were organised, with strict controls over how many breaks there could be; the total amount of advertising permitted in an hour and across a day; and what products could be advertised at what time of day, or even advertised at all. On top of that, broadcasters developed their own house rules, for example, to ensure the same spot did not come up in break after break – as audiences get irritated, which makes the advertisers irritated.

Consumers grew to accept and understand the language of broadcast television. When streaming services and new channels came along which did not stick to this language – many call it the ‘broadcast premium’ – it was difficult to accept.

Advertising on nonlinear services is normally added to the stream by third-party providers who have little understanding about the broadcast premium. They simply drop commercials in with little regard for the content or the time of day, and viewers see the same ad inventory again and again and again. If the third-party ad house has not made enough sales, audiences get slates that say the programme will resume shortly. Or even black screens. Broadcasters quite rightly take the view that they wish to maximise revenue no matter how their content reaches

the audience. They better understand than other digital outlets the need to provide equal quality of service (QoS) across both their linear and digital channels.

Digital-first providers are beginning to appreciate that the broadcast premium is a real and valuable commodity and would like their audiences to be treated in the same considerate manner. They want to be like broadcasters. Clearly what is needed is a means of treating digital services like broadcast services. That means breaking out of the technical siloes and having a unified approach to every aspect of a service, no matter how it will be delivered.

This is a transformational change. For it to work, every aspect has to be under the control of a single overarching and unified platform. It must bind together all the critical capabilities of scheduling, rights management, playout, live events and VOD, as well as ad sales, placement, serving and campaign management. Such a platform will enable media companies to deliver linear programming and VOD content, with insertion of commercials across all services, and incorporating triggers for local and dynamic ad insertion.

In short, it must provide a means of managing and monetising broadcast, OTT, FAST, pop-up and video content, from one dashboard. It must deliver the broadcast premium, and it must be simple to implement and operate, aiming to maximise revenues while optimising overheads.



Earlier this year, Imagine Communications introduced Imagine Aviator™ to address this requirement. Unsurprisingly, it was designed from the ground up to live in the cloud. It is available as software-as-a-service – a complete turnkey service. Alternatively, media companies can license the software and run it in their own cloud account. The process is divided into three broad chapters: plan, make and monetise.

Plan covers all the stages of scheduling, including content acquisition and rights management. Make oversees the media supply chain and secure content storage, as well as providing playout to the premium standards expected from Imagine's long history in the sector. Because it is designed for one-stop control of multiple outputs, each channel can have multiple variants for different platforms and for regionalisation. Commercials and trailers appropriate for each platform, including catch-up and VOD, can be inserted by the playout functionality of Aviator, or they can be marked with SCTE 35 signals for downstream dynamic ad insertion.

The third chapter, monetise, is self-explanatory. By taking a common view of advertising across all platforms, it ensures optimum use of the ad inventory. Through intelligent ad decisioning, it provides advertisers with proven audience reach and accurate targeting, by using any appropriate platform to guarantee the CPM. It does this while delivering broadcast-style placements across the outputs,

ensuring audiences get the commercials that are appropriate and are not bored by repetition. Hosting it in the cloud provides the elasticity to adjust requirements as needs change. The cloud offers flexibility, limitless capacity and global reach. The ad placement routines, for example, are designed for 10 million decisions per second, so even the largest media enterprise can be sure that every break is accurately filled; every campaign reaches its promised targets.

The cloud also gives the system complete scalability, which means channels can be initiated from scratch, integrated into the plan/make/monetise routines, and be on air or online in hours or even minutes in some instances, rather than months. Pop-up channels for music festivals or major sports events can be exactly that: popped up when needed, taken down when finished.

The media enterprises that succeed will be the ones that attract and retain an audience, which means delivering not just the content but the experience they want: engaging and appropriate, as well as professional. They need to do this while minimising operational costs – allowing maximum investment in content – and competing for the highest revenues. To achieve that depends upon the skill, flair and experience of the broadcast executive. They deserve technology platforms that support their skills without restriction and without limitations.

A new cloud roadmap for telcos and TV operators

For many telcos and TV operators, the end goal is clear. There are potentially huge rewards for delivering high-quality, personalized media services to their subscribers as an add-on to existing fixed broadband and mobile packages. They have a common ambition to move to entirely unicast OTT streaming on smart devices and TVs. The first step towards realizing this end goal is to transform their legacy business models and maintain the value of their commercially important media functions. the experience they expect, and make a fair return on the operation?

Guillermo Legorburo
Director, Sales Engineering, MediaKind

Yet the reality is more complex. Media delivery is expensive and complicated to enable through networks in the lowest possible latency and at the requisite quality. Traditionally, both telcos and operators have built legacy systems with multiple generations of set-top-boxes. However, the time for transformation has arrived to correspond with the rapid pace of innovation seen across the media industry and make a move toward cloud architecture and the benefits it brings.

Transitioning from legacy infrastructure is rarely straightforward, and the move to the cloud is no different. This scale of transformation requires a delicate balancing act between making full use of the opportunities provided by the public cloud to ascend the role of a service aggregator while continuing to serve potentially millions of customers still using legacy hardware. Although public cloud migration is well underway for many telcos and TV operators, a long journey awaits in fully modernizing their operations and services as they continue to operate and integrate legacy assets and systems. In short, telcos and TV operators require a new cloud roadmap.

The value of the public cloud

The biggest challenge in transitioning to the public cloud lies in assessing and successfully addressing the market potential of any given media service offering. Telcos and TV operators have myriad decisions, including which customers to target, what end users are willing to pay, and what USPs they have over their competition. This complex migration and transformation also impact 'make

or buy' decisions; in other words, balancing between areas in which they can build themselves versus buying from a trusted partner.

The decision between building cloud-based solutions in-house or working with key media vendors and technology experts plays a considerable role in the overall public cloud business case. Although many larger telcos and TV operators have traditionally gone down the path of in-house development, history has shown that this often, and with very few exceptions, limits their ability to take advantage of rapid innovation and respond to changes and emerging technologies.

Added with the bottom-line fact that major growth opportunities are often relatively rare for telcos and TV operators and their media services, it's no longer cost-effective for them to undertake their own developments and invest in and deploy innovations in a timely way. Therefore, the logical choice is to partner with media technology experts fluent in public cloud technology and run their software in all the public cloud providers.

Once the market for growing a media service has been identified, it's then vital to create a blueprint that maps out the journey from legacy infrastructure to the cloud. TV operators and telcos need an agreed architecture and journey route with trusted technology partners guiding them region-by-region. But again, there are further decisions that come into play. Do they select a central solution that follows a single blueprint to reach scale advantages and cost benefits (as well as lower production



and operating costs)? Or do they opt for a decentralized and more custom solution with options to tailor it and differentiate locally or regionally?

True progress requires a radical shift in mindset – that of a migration from one-time CAPEX purchases to rolling OPEX, based on software and public cloud infrastructure. One of the main challenges operators face is building a business case around multi-cloud offerings. It's especially important given the sheer number of channels they operate. Taking to the cloud is straightforward for a direct-to-consumer (D2C) service that operates just a handful of channels. But it's a different ballpark for the operator who runs 300-400 live channels. For them, it's a case of walking before they can run full steam ahead into a cloud-based future. By starting the migration to the cloud with 15-20% of their channels, they can build enough validation and realism to make the initial journey before completely embracing the public cloud.

Opportunities as aggregators of media services

The panacea for operators is to reach a true unicast state. Once achieved, the opportunity to deliver highly personalized and targeted service with technologies such as Dynamic Ad Insertion is made much more feasible, including the potential to send individual adverts to viewers on a one-to-one basis. Such functionalities heighten the monetization potential of their assets. This can be seen both in terms of building loyal customer bases and expanding media offerings with new services such as gaming, metaverse, and other interactive formats.

Another exciting prospect for telcos and TV operators in the media space is the prospect of transcending the role of super aggregators. Today's market is already awash

full of existing and new streaming services, while a growing number of D2C offerings from brands and content owners are continually being rolled out month on month. Yet far too much of the content consumption experience is spent dedicated to searching for content rather than watching it. By aggregating these brands within their own platforms, telcos and TV operators can offer an easy way to cross-search the content their viewers are demanding without any need to dip in and out of multiple, separate interfaces. Although challenges remain regarding overcoming content rights, licensing issues, and integrating with content owners, there is an exciting opportunity to create a differentiated look and form within a consolidated service, utilizing a bespoke UX and UI.

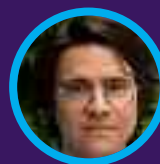
The journey to the public cloud continues

Telcos and TV operators have a complicated path to navigate as they embark on the monumental transition of their legacy infrastructure and operational mindset. However, many opportunities are available for those who get them right. By relying on trusted technology partners that can take them towards ideal multi-tenant, public cloud platforms, they can focus on acquiring assets and licensing of their own that can drive them towards their future as media service aggregators.

The possibilities in this future are yet to be benchmarked. However, from TV and films to gaming to news and entertainment, the gateway is now open for telcos and operators to become the consumer home for all streaming experiences and trusted media providers for audiences worldwide. By trusting the roadmaps laid out and relying on public cloud-based technologies, a new and exciting future for media delivery may be closer than they realize.

Using Test Automation to Improve Streaming Quality and Team Agility

We've all been there before. You're watching the most exciting moment of the season finale of your favorite show when the video freezes. Or maybe the application crashes, or the audio drops out, or there's a connection issue that prevents you from opening the app in the first place. In that moment, these small annoyances of the digital world are the most frustrating thing imaginable.



Mathieu Planche
CEO, Witbe

The content providers, developers, and QA testers behind streaming video apps feel that frustration too. In an ideal world, every video would be delivered perfectly whenever you press play. In reality, it has never been more complicated.

Let's consider a single streaming app, like Netflix or Hulu. They are available on dozens of different platforms, such as iOS, Android, Smart TVs, Fire Sticks, gaming consoles, and more, which are then deployed all over the world on a wide variety of different networks. They use dozens of different frameworks, involving dozens of different companies and partners. How could a single app developer possibly test the performance on every single set-up?

The same can be said for user interactions. Just last month, an unprecedented number of viewers tuned in to a major streaming platform to watch a live premiere, crashing the app for thousands of users. With so many factors to consider, how can streaming video providers properly prepare?

The Importance of Quality of Experience

It's essential for content providers to measure the Quality of Experience (QoE) that their customers receive at home. Simply testing the quality of the videos that are stored on their servers isn't enough. Ensuring a high QoE for viewers across every platform they use is the best way to stand out from the competition and retain customers.

Maintaining a high QoE requires testing and monitoring. QA teams test new software releases around the clock to ensure that updates launch with as few bugs as possible. After a software release, monitoring video performance

across all available platforms and networks is equally important. Even with unlimited resources, accomplishing these goals solely through manual work would be a huge challenge. This is why automated testing and proactive monitoring are so crucial.

A Universal Approach

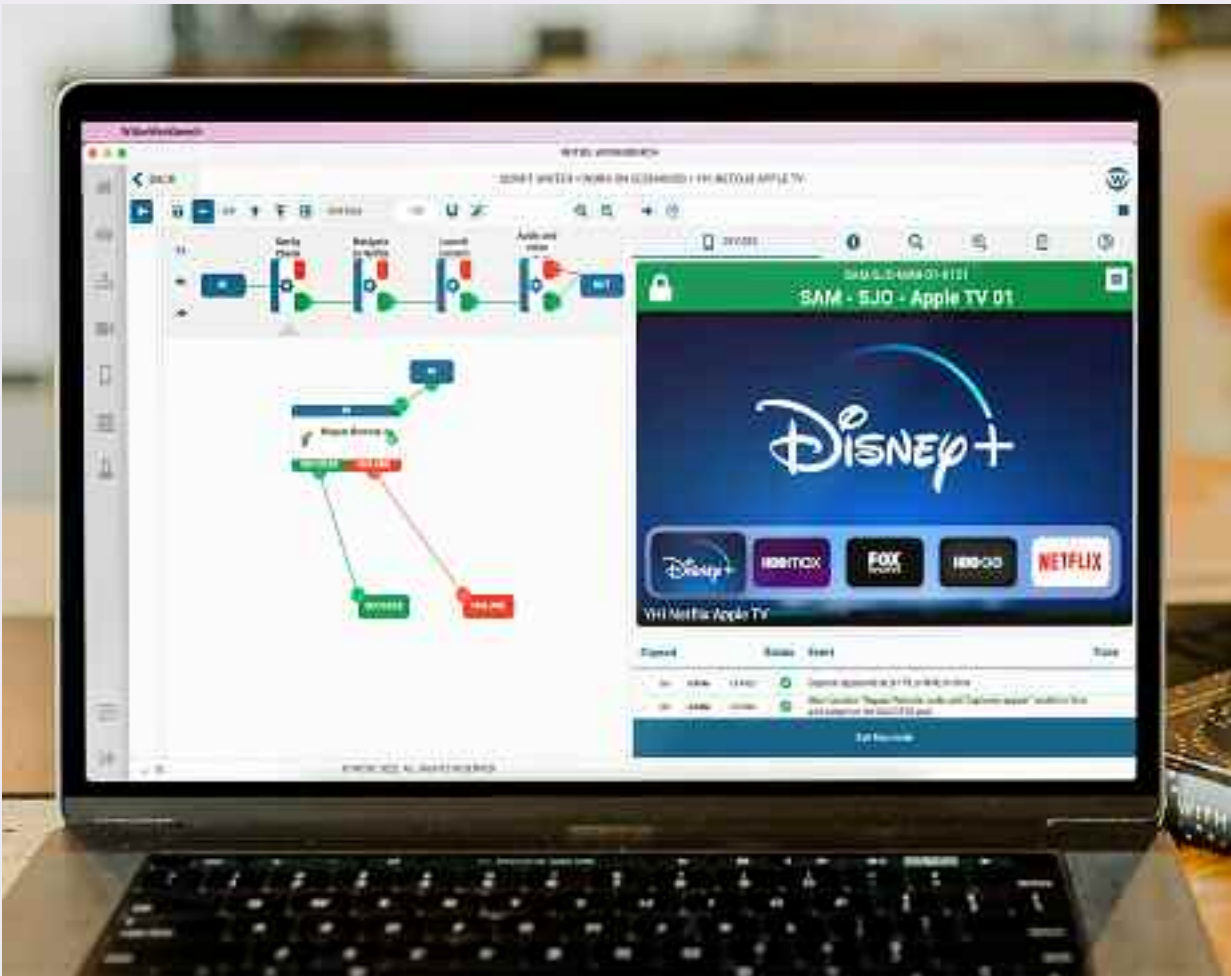
Automated testing allows developers and their teams to program testing scenarios and view the results in real time. Automated technology can interact with software in the same way as human users, allowing teams to systematize certain aspects of their workflow and remain agile, while focusing more manual effort on pain points.

A major benefit of using test automation is the ability to test more platforms simultaneously. If a QA team is testing a new software release on a Set-Top Box, they can simultaneously run automated tests to see how the same software performs on Smart TVs, mobile devices, and web browsers – thus ensuring consistent performance quality across every device. Knowing how each software release affects each specific platform is invaluable.

Reducing Stress

Automated testing is also valuable for replicating user behavior in ways that human testers cannot. It's difficult to manually test how a video streaming app is performing after fifteen hours of continuous use or constant channel changes. This type of usage is inevitable when the software is widely released. Automated testing helps cover the stress, endurance, and performance testing that is impossible to accomplish manually.

This approach also allows teams to better divide their focus. When technology is tackling the most tedious and



taxing parts of the workflow, team members can turn their efforts to the more hands-on aspects of testing. In other words, operators are achieving results around the clock – even while the team is sleeping – and resources are used more efficiently throughout the process.

Staying Proactive

Proactive monitoring technology uses a similar approach to measure QoE on publicly available software: It can run on physical devices located in any market you are testing. Using unique algorithms, it analyzes video streams in real time and assesses them on the same criteria as a human user would.

Proactive monitoring is particularly helpful in the event of a service disruption or interruption. The technology can immediately send alerts that an asset is not available or that the streaming quality has dipped, allowing video operations teams to resolve

this before customers even notice. This reduces the usual time and resources it would take to identify, and then fix, an issue. Staying proactive is the best defense in combatting service interruptions.

Work More Efficiently, Not More Hours

Maintaining a high QoE for your customers isn't easy, but it's the key to long-term success. Teams working on video streaming content can stay agile by relying on automated testing and proactive monitoring. It allows operators to divide resources more effectively to ensure their software runs well on a wide variety of platforms and networks.

Remember that feeling of frustration when the perfect video moment was ruined by an app crash? How different it would have been if everything had gone smoothly. Test automation and proactive monitoring help streaming video providers get closer to that goal and work more efficiently along the way.

Three Media

Don't focus on cloud. Focus on opportunities from new generation operating models that the cloud enables

At the moment there is a huge amount of noise in the media industry concerning the cloud. Vendors are clamouring to say their solution offers something new, while users are, by and large, unsure and nervous on its exact value.

The simple view of the cloud which is often quoted – giving all our data and processing to AWS or Alibaba or one of the others – is really not helpful when trying to navigate its value. The cloud is a far greater opportunity to reshape your business than simply where you host technical infrastructure.

We should also stop obsessing with the cloud. If we have to talk technology, what is really important is the possibility of building software-defined solutions within a virtualised ecosystem, bringing together applications from all the best media specialist vendors. That virtualised ecosystem can just as easily be on premises as in the cloud, or in a hybrid architecture.

This solution should obviously accomplish what businesses want today, but it should also provide a clear pathway to what they are going to need in the future. It is not just about choosing to run software-defined systems on someone else's hardware, it is much more than that. It is important to take a step back and decide what the end game is. What are you, as a business, trying to achieve? How will you take your creative talents, plus your operational and technical skills, and make money from them?

At Three Media we talk about the next generation operating model. What the software-defined approach allows us to do is to pick just the functionality we need and put it together in a way that makes sense to our customers' specific requirements and commercial drivers.

This is really important. From the day, exactly 100 years ago, when the BBC launched the first public radio station until this moment, the media industry has been defined by what the technology allowed us to do. We see the software-defined revolution as allowing media

enterprises to define and realise goals across technical, operational, commercial and business operations in a way that no other technology change has allowed. Indeed, the commercial re-engineering is as exciting as the changes to legacy broadcast heavy iron!

We see this as a great opportunity to realign the media enterprise. We should all be asking questions, and deliberating answers, around how to use smart business transformation to lead to better ways of working, to re-imagine the optimal business model, then realise it. Along the way, it means aligning your resources in technology, in people and in work processes, to perfect your value proposition. As technology today includes artificial intelligence and machine learning, it is perfectly reasonable to build a high degree of automation into the new generation operating model, so people are used for what people do best.

These choices, these re-architectures, are business decisions. They may well be influenced by creative or operational decisions. But they are not technological decisions: the technology is evolving to be able support the most demanding business ambitions. Simply moving your current models, processes and workflows into the cloud is a lost opportunity. The opportunity comes in reimagining and optimising your operating model. It is important to accept that there is no one-size-fits-all. Each media business will have its own definition of its next generation operating model, and its own pathway to get there.



While creativity is still central to what we do and content is king, from a business perspective we have to move towards the concept of the virtual media supply chain. That approach cannot be piecemeal: it has to be glass-to-glass. But the pathways to getting there are very manageable.

Content on its own does not give you the keys to the kingdom. Metadata carries that supporting role but in reality carries equal importance as we move towards a virtualised world. It is the backbone and engine driving the business but we have to work the data harder and we have to know what it is telling us about our processes and then use them to optimise the supply chain.

At Three Media we are strong believers in process mining, which Wikipedia defines as “a family of techniques to support the analysis of operational processes, with the goal to turn event data into insights and actions”. Establishing it can appear complex and scary, but once it is running it can tell you all you need to know about how your business is performing, where the pinch points are, and where you can win new revenues with no extra investment. As a consultancy we have been fortunate to work with some of the biggest broadcasters and media companies around the world, tackling just these issues (and will be very happy to talk to many more). Our real-world experience suggests that, in the software-defined domain, the problems of interoperability and interconnectivity go away. The technology becomes the servant of the business, where solutions are led by service and customer defined needs.

And you really do not need to throw away what you have today. Once you have decided where you want to go – in business terms – then you can structure transition at your pace to meet your business case, continually evaluating what you have achieved so you can respond to new operating opportunities and sector demands.

You will find that the digital dividend never ends. It will give you the flexibility to evolve quickly and easily to ensure your competitive and service advantage is realised.

We talk a lot about agility in the cloud but it is more important to be agile in the ways you tackle your goals. Do not think of this business transformation as three years of intensive analysis and coding leading up to a big bang. That is not the real route to seizing much greater opportunities. Agility is the key. Each step must be defined carefully so that once achieved it can be learnt from and count the benefits.

Yes, we are in a transition from ground to cloud. But the important part is not the technology, it is the business transformation these new technologies allow us, in operations and in our commercial models. The new generation business model – the media supply chain – if done properly, will create competitive advantage, retain and boost audiences, control costs and maximise revenues.

Debra Slater, Managing Director, Three Media

As SVOD Subscriptions Explode Globally, AI/ML and Cloud Technologies Are Key to Automating Closed Captioning, Subtitling, and Audio Dubbing Processes

By 2026, the number of SVOD subscriptions is expected to reach 1.64 billion globally — an increase of 491 million compared with 2021. To drive this growth, SVOD service providers such as Netflix and Amazon Prime Video are relying on international subscribers. Case in point, Netflix is now available for streaming in more than 190 countries.



Manik Gupta
Associate Director of
Engineering at Interra
Systems

As video service providers look to globalize their content to reach untapped audiences, closed captioning, subtitling, and audio dubbing have become increasingly crucial elements of their operations. However, with roughly 6,500 different languages spoken around the world today, it is imperative for providers to take advantage of the latest technologies – including artificial intelligence (AI), machine learning (ML), and cloud-based solutions – to streamline these processes.

Automating the Delivery of Closed Captions and Subtitles Historically, captioning and subtitling have been time-intensive manual processes. However, now that OTT service providers are managing a massive amount of streamed content for a global audience, the tide is turning toward automated solutions featuring AI and ML technologies that minimize captioning and subtitling costs while maximizing efficiency.

Automatic Speech Recognition (ASR) and other ML technologies enable streaming providers to realize tremendous efficiencies in their media captioning and subtitling workflows, including faster reviewing, reduced turnaround time, and lower costs. ASR, in particular, allows video service providers to instantly recognize and translate spoken language into text, helping to streamline the creation of captions. ASR includes multiple components, offering streaming providers an all-in-one solution for the generation and QC of captions, subtitles, and audio dubbing.

Moving to the Cloud

The increasing adoption of cloud technologies is another key trend in video streaming. The global video streaming software market is expected to more than double over the next few years, growing at a CAGR of 18.5% to reach \$17.5 billion in 2026 – up from \$7.5 billion in 2021. This shift to the cloud by OTT video service providers is apparent across the entire media workflow, from encoding to QC. Using a cloud-based ASR system, they can reap all the benefits of the cloud to create captions and subtitles with increased flexibility, scalability, and cost-effectiveness.

Automating Dubbing Workflows

Audio dubbing is an essential part of streaming services, especially for video service providers offering content in many different geographies around the world. However, the manual dubbing of audio is a complicated process involving transcription, translation, and speech generation. Automation is key to bringing greater



Figure 1. AI/ML-based technology powers Automatic Speech Recognition for closed captions and subtitles

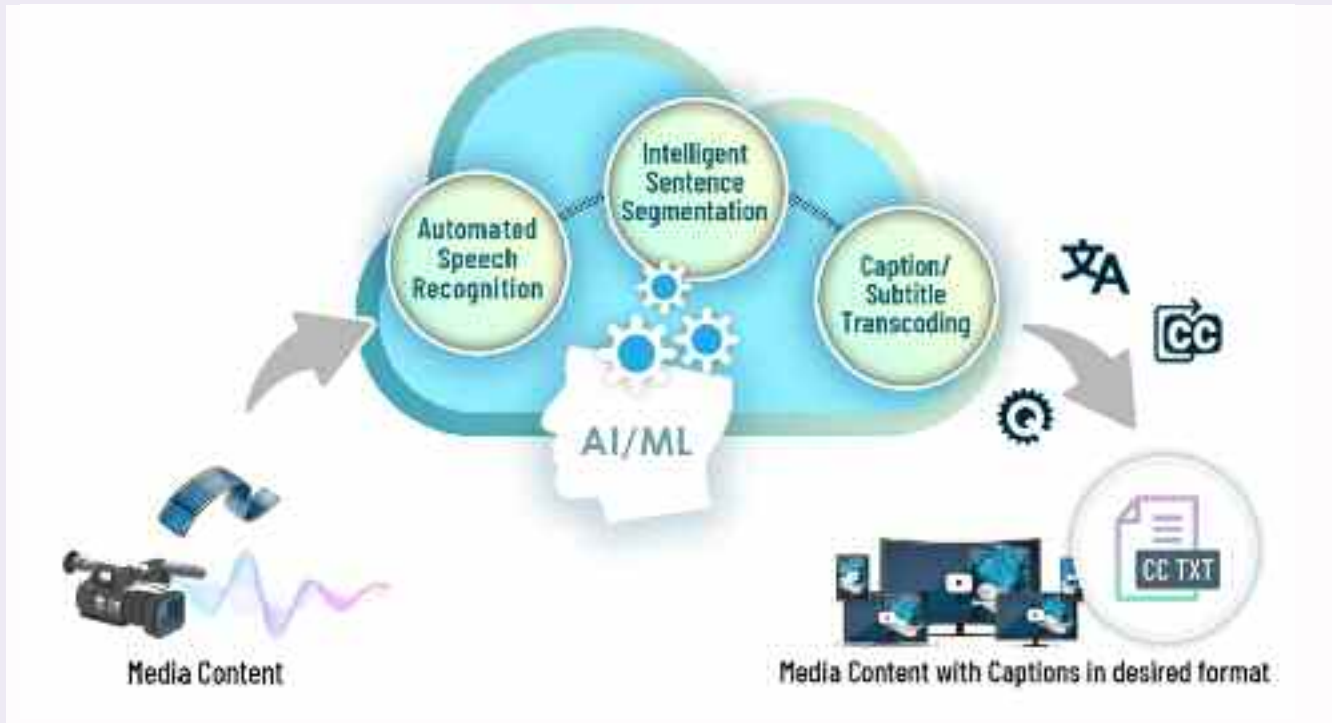


Figure 2. Cloud based Captioning Solution

efficiency to the process. Through automation, video service providers can, for example, verify complex dubbing packages, including multiple MXF and .wav files, to ensure that package variations are accurate and that audio tracks are dubbed properly. Furthermore, automation can help video service providers confirm the preciseness of metadata package structures, while also checking that the number of audio tracks, channel configuration of dubbed tracks, and duration of the original audio track compared with dubbed audio tracks are correct.

Another way the industry is tackling audio dubbing challenges is through innovations in automation and AI. Using an AI-based, automated QC solution, service providers can check the synchronization between the dubbed track and the master track with greater efficiency to identify mismatches in the timing between audio and video. This is crucial to ensuring that there are no syncing issues.

Recent advancements in AI can also help improve the proficiency and quality of audio dubbing, especially for language identification. In recent years, the intelligence of AI/ML algorithms has improved so much that automated QC systems can now detect language in any audio track with an accuracy of more than 90%. One of the key aspects of AI/ML is that training these models only takes a few hours. After the training is over, AI technology can predict the dialect spoken in the audio track. Following this, using metadata, content creators can verify that the detected language in the audio track is correct.

Maintaining Consistent Quality Across Different Regions

With AI- and ML-based QC solutions, video service providers can ensure that OTT content delivered to different geographies maintains the outstanding quality today's audiences demand. Moreover, with content going global, it is crucial to comply with strict regional and industry regulations. For instance, in the United States, AI-based QC tools can ensure content meets relevant guidelines laid out by the Federal Communications Commission (FCC), an independent agency of the U.S. federal government that regulates communications by radio, television, wire, satellite, and cable across the country. Advanced QC tools can also develop algorithms to check the synchronization between audio and subtitles in different languages.

Final Thoughts

Advancements in AI and ML technology are helping service providers extend the reach of their content to global audiences and capture additional viewers. With AI/ML-based solutions, they can create and QC captions, subtitles, and audio dubs with greater speed, accuracy, and at scale, without heavily investing in manual labor. AI and ML technologies ensure a high quality of experience for global viewers on every device, reducing the chance for human error. In the future, streaming providers will need to embrace AI/ML and cloud-based QC solutions as much as possible, freeing up staff to focus on creative jobs like translating difficult audio segments and adding audio descriptions.

EVS

Balancing cloud, on prem and edge deployments for greater production agility

Broadcasters at a crossroads

In the broadcast and media industry, being able to respond quickly to evolving requirements, factors and environments is key. The lockdowns that swept the world during the Covid-19 pandemic confirmed this imperative to adapt, with many companies swiftly adjusting their broadcast infrastructures with remote and/or virtual workflows in order to stay afloat.



Oscar Teran
*SVP SaaS Offering &
Digital Channels, EVS*

These recent events have prompted a profound mindset shift. Media companies have grown less fearful of trying new ways of working and implementing new production workflows. Driven by their need for more flexibility, they have accelerated their move away from traditional setups, where resources are mainly centralized and provisioned for peak demand, towards more distributed and scalable ecosystems. The cloud is also becoming more prevalent, as broadcasters have learned to overcome their initial hesitancy and embrace the opportunities this technology provides beyond the well-known OTT and VOD applications.

Yes, the cloud is gaining momentum, but hardware still has its place within broadcast infrastructures. In fact, on-premises devices and applications remain essential for many real-time operations in which deterministic SLAs and high-quality live workflows are required. Budgetary considerations are also important: a full cloud setup, given a certain volume, may not always be the most effective way to respond to a high-quality production.

So how can broadcasters keep pace and make confident decisions in today's transforming landscape?

Balanced Computing: striking the right balance

For EVS, it's about striking the right balance. Together with our customers we work on identifying the right combinations of hardware and software, and then selecting the deployment environment that best suits their needs – whether that's in edge, private or public cloud or on-premises. This architectural philosophy, which we call Balanced Computing, gives us the flexibility to respond to more use cases in a more efficient way. In recent years, we've aligned our portfolio to this philosophy, to give broadcasters and media companies the power to adapt their setups to any production requirement and to help them stay relevant in the future.

As an example, we're seeing a rising demand of our cloud-based solutions and services, as a way to complement existing on premises infrastructures. This is especially the case for productions of major international events that continue to rely on EVS' live production server structure (the robust XT-VIA and the more recent software-defined XS-NEO) to ensure high-quality content ingest but who also want to take advantage of the cloud to roll out parts of their broadcast processes in a highly flexible and scalable way.



Widely appreciated for its storytelling capabilities, the XtraMotion service can be activated on demand to generate super slow-motion replays from any camera while meeting the strictest quality and turnaround requirements. EVS operators can seamlessly clip any content from any camera, render it to super slow-motion and play it back on air within seconds for added wow factor. While XtraMotion can be entirely deployed in the cloud, production teams can also choose to run it on-premise, if they face limited connectivity in a venue or if they really want to enjoy an ultra-low latency access to the EVS SaaS offering.

These big event productions can also benefit from deploying their delivery functions in the cloud as proven by EVS' MediaHub SaaS content platform. Designed to empower highly collaborative workflows, Mediahub is well suited for big events as it allows rights owners to distribute content quickly and efficiently to rights-holders, who can simply 'click and collect' the assets they need, from any location. This feature combined with many embedded functions, gives content owners the possibility to enable virtual IBC new generation services for their diverse community of rights holders. At the same time, they

can facilitate access to historical archive footage for additional monetizing opportunities.

Furthermore, Mediahub can be integrated with popular cloud edit provider suites, providing a seamless working experience regardless of where the footage is stored, whether it's at a remote location or a cloud bucket.

Conclusion

In demand for greater agility, many companies are on a mission to redefine their business models with cloud technologies. Yes, the cloud allows for flexible workflows, but legacy hardware infrastructures are still relevant in today's landscape and intelligent decisions need to be made in terms of what should be used and where should it be deployed – this implies that EVS is required to offer both CAPEX and flexible OPEX solutions. By taking into account technical or business requirements, as well as budgetary considerations, EVS' Balanced Computing approach allows broadcasters and media companies to swiftly adapt, improve and extend their workflows and embrace innovative tools without any disruption to their current infrastructures.

Why Business Agility and Resilience are 'Must-Haves' for Today's Digital Leaders

Business agility has become one of the most talked about organizational capabilities of recent years. Indeed, the ability to embrace new ways of thinking and reinvent businesses at pace and scale has become essential to success. Research suggests, for example, that the most agile companies outperform their competitors in terms of revenue and profitable growth by a factor of 2-3 times. The bottom line is there can be no doubt that agile business practices drive results across the organization.



Mark Hasselmann
Product Manager
OpenMedia
portfolio, CGI

But what does 'agile' represent? [The Agile Business Consortium](#), for example, points towards "agility in an organization's culture, leadership, strategy, and governance that adds value to all stakeholders who operate in uncertain, complex, and ambiguous environments."

In practical terms, agile businesses can respond to external and internal opportunities and risks quickly, adapting faster and remaining customer-focused – key qualities in today's fast-paced digital economy.

Fortunately, compared to just a few years ago, more businesses have direct experience of the role, challenges, and benefits of an agile model than ever before. Given the COVID-19 pandemic, this is to be expected – organizations had to move quickly, focusing on core business activities, collaborating online, and innovating to solve problems they'd never experienced before. Among the varied benefits that came as a result, many organizations achieved record technology and process implementation times as they rushed to deploy new solutions to keep their businesses alive. At CGI we want to be able to detect trends and realize those for our clients. We are setting up lean startup workflows to kick off development fast and constantly monitor feedback on our innovations. Misleading targets can be corrected with shorter reaction times and priorities can be adjusted due to high transparency within our

organization and the well-cultivated alignment between Management and Development Teams.

In addition to this acceleration in decision-making and the assurance of maximum transparency to support alignment and collaboration across all levels and departments, there have also been significant advances in leadership. The rebuild of governance around new organizational structures and a cultural change support a growing trust in people – from all directions, as management and staff have to adopt new ways of working.

As part of our transition after the merge of OpenMedia into CGI, we invested a lot of effort to train and coach our members in new ways of working. We re-shaped our agile processes, increased transparency, and pushed interoperability of our teams in all areas (from management, over implementation, and project teams to support and development teams). This complete vertical and horizontal consistency assures the understanding of our product vision and provides possibilities to decentralize decisions – as we are all aiming at the same big picture and understand the business needs. Constant offerings for training, internal working groups, and communities of special topics ensure a dynamic view of necessities and possibilities. New collaboration ideas and growing alignment lead to a new culture and mindset within an organization. And this in return supports the intrinsic motivation of our colleagues.

Agility fuels resilience

Having experienced first-hand the benefits of business agility, and, in some cases, its crucial role in adapting to rapid, existential challenges, many successful organizations also view agility through an additional lens: how to become more resilient.

In the current challenging economic climate, this is even more relevant. Armed with the individual and collective lessons learned from the pandemic, for example, organizations are now focusing on sustaining progress and becoming more resilient. In doing so, they should focus on three key priorities: energy, security, and development.

In particular, drive, positivity, and energy are required to fuel and maintain the changes required to initiate and sustain business agility. This requires that organizations operate in a safe and secure ecosystem that provides a foundation for ongoing transformation, enabling individuals and teams to build the capabilities that allow them to thrive.

In doing so, they can address a wide variety of organizational objectives, from transforming for net zero, and delivering on environmental, social, and corporate governance (ESG) goals to redesigning value chains and shaping the future of work, among many others.

Clearly, technology and data play an important role as commercial and government organizations continue to focus on improving their business and operating models. Recent [research](#) has revealed that organizations have modernized 37% of their applications, with 72% of this implemented on a cloud foundation. What's more, they forecast that 72% of their applications will be modernized within the next 2-3 years.

This accelerating pace of tech infrastructure modernization is crucial, not least because it helps organizations deliver a faster time to value. The good news is that the burgeoning SaaS solutions industry will only accelerate the process even further, giving businesses the ability to quickly adopt new technology services without the need for significant capital outlay.

Agile digital leaders

In addition, today's agile digital leaders understand the increasingly strategic role played by partners and business ecosystems. Whether they help develop new business or operating models, augment teams with flexible resources or bring prebuilt accelerators and best practices, partners bring the speed and expertise required to be agile that is virtually impossible to replicate in-house.

Among the main challenges faced by digital leaders when building agility into their culture, processes and technologies are creating value and growth. Although many executives (87%) say they have a strategy in place to become more digital, for example, only 20% say they are producing the expected results.

To address this gap, effective digital leaders pivot from predicting and planning to sensing and responding. This requires the ability to connect strategy, operating model, and execution and create greater transparency and alignment. In doing so, they must understand the need to sense and respond to change quickly – they can only do that successfully when they have designed their business and operating models to be agile.

Faced with the need to develop an agile business ethos, organizations must also recognize they cannot do this alone. Building a network of strategic partners is essential to long-term success and building the ability to adapt at pace and scale.



Fabric

Metadata Management Platform – Build or Buy?

'We can build that ourselves'

This is a common refrain from IT departments, whenever SaaS products such as Fabric are offered for consideration. It's certainly possible that your in-house IT team could build you a functioning bespoke metadata management platform - but should they?

Is it worth delaying your roll-out to allow for the build? Is it worth the investment and the risk? How do the ongoing maintenance costs compare against the costs of a SaaS subscription? There are a host of considerations to evaluate, that boil down to one common question – should you 'Build or Buy'?



Andrew Holland

Director of Data Services, Fabric

In this article we'll explore some of the factors.

- **Risk.** Will it work? There is no guarantee that your IT team will be able to build all of the functionality you require, let alone deliver it on time and within budget. There is a lot of risk involved. Plug and play toolsets like Figma can give the unrealistic view that it is possible to prototype and build fully functioning new applications quickly – but there is a vast distance between a mock-up and a fully fledged application – made up of time, effort, risk and expense
- **Delay.** How long will it take to build your own platform? You could roll out Fabric now with rapid seamless integrations and powerful tools to deduplicate and clean up your catalog while you migrate your content metadata. Can you afford to wait?
- **Cost.** How much will it cost to build? Developers are notorious for underestimating because prototypes can happen quickly. The reality is that to build out a true enterprise application with all the right APIs, user roles and security, information security requirements, takes a lot longer than anyone realizes on first pass.
- **Recurring cost = Subscription without benefits.** There is often a false impression that building your own system requires a single, up-front investment, as opposed to the ongoing payments of a subscription model – essentially the 'Cap-ex self-build delusion'.

This is mistaken. Any self-built system will require ongoing updates, troubleshooting, API development, pen-testing, and maintenance. All of this work creates an ongoing cost – that would be better deployed on a guaranteed certified product. The general consensus is that the annual cost of maintaining a custom self-built system is 20% of the overall build cost – effectively a subscription without any of the benefits. <https://westarete.com/insights/maintenance-costs-for-custom-software/>

- **Capex vs Opex.** Strategic technology decisions should really be separated from the political minutiae of which budget to use. A decent SaaS provider will be able to offer you an up-front cost that can be covered from a Capex budget, or an ongoing subscription fee that can be paid from an Opex budget. The focus should be on how much value is being derived from the overall expenditure.
- **Expertise.** In-house IT departments will insist that no-one knows your business as well as they do. No one but them could make a custom service so perfectly suited to your business' particular needs. But no-one knows OUR business as well as we do. Our business is Metadata management. We're the market-leading experts. Your in-house IT department has a million tasks to contend with. They are never going to create a system that rivals what Fabric has to offer.



- **Technical Debt.** API keys are updated and changed. MAM systems are regularly updated. Business acquisitions and mergers require new systems integrations. As your in-house app evolves to respond to these updates it will accumulate fixes, patches and customizations that will require ever-increasing attention. Instead of a robust and widely used platform that has specialist support teams available – you will become dependent on a small silo of individuals in your IT department who understand the idiosyncrasies of your system.
- **Sole Focus.** Our only focus is to deliver a perfectly integrated and elegantly functioning metadata management platform. We have a track record of delivering catalog migrations, deduplications and systems integrations in record time – with long experience of the common problems faced by numerous major organizations. This expertise serves all parties well. In comparison, in house custom-built application projects can lose impetus as teams find ways to deprioritize in favor of day to day business.
- **Added Functionality.** When a client requests a new feature from Fabric – we build it – then we make it available to all of our customers. We have added, improved and refined dozens of new features to our main platform, meaning that all of our customers benefit from upgraded service. Many of these features require considerable development investments that would not be cost effective if built in-house.

- **Unified Front End.** Our seamless 3rd party integrations across your supply chain surface key data attributes (like avails from rights, or asset details from a MAM), giving unparalleled insights, helping to get ahead of deliveries.

Clearly, in the current market, buying a dedicated subscription SaaS product such as Fabric has the advantage over building an in-house solution. Why try to build an expensive solution that is outside your team's direct area of expertise, when an excellent option is already available for immediate deployment? Ultimately, every business will have different requirements, and different degrees of in-house IT capability, and it is up to business leaders to identify what is best for their organization. Make sure you make the best choice – and do what's right for your business.

Fabric's pioneering platform is in use by some of the world's most prestigious studios, broadcasters and distributors. Find out why at www.fabricdata.com.



The Switch

Pushing the boundaries: Evolving live event media rights into the streaming era

As the live events landscape heads full-throttle towards social media, streaming, and video-on-demand (VOD), rightsholders urgently need to find greater value from their media assets beyond the realms of traditional, live broadcast TV.

The rise of direct-to-consumer streaming platforms and the popularity of on-demand replays of major live events online via catch-up services and social media has made for a far richer content landscape. As such, traditional broadcast services must accommodate each consumer's streaming preference.



Robert Szabo-Rowe
SVP Engineering and
Product Management,
The Switch

Despite being among the most expensive media assets to acquire, live content ironically has traditionally had the shortest shelf life when compared to films and TV shows. This situation begs questions for broadcasters and content owners paying hundreds of millions or even billions for a sports season, esports league, or entertainment event – where does the true value of that content lie, and are they getting the most out of their rights acquisitions?

Today's comprehensive live TV environment spans pre- and post-game shows, red carpet interviews, studio interviews with celebrities and talent, and new creative forms of shoulder programming, creating a content continuum that extends far beyond the 90-minute Premier League football match, a 48-minute NBA game or two-hour awards ceremony. This content continuum of live and on-demand elements creates exciting opportunities for rightsholders to experiment with their assets and deliver engaging and relevant programming to a range of target audiences.

From live to on-demand

The exodus of traditional broadcast viewers toward digital platforms has been widely published in analyst reports. [Deloitte Global](#), for example, expects 2022 to be the last

year traditional broadcasters retain the majority share of viewing hours in the UK, with other global markets expected to follow suit quickly.

The emphasis on linear coverage and the acquisition of rights on the basis that the live broadcast is where the true value lies has to be seriously rethought as viewing habits continue to evolve. Thankfully, advances in cloud-based technology for live production, clipping and editing, streaming, and video processing is making the transition towards rapid on-demand highlights creation on social media and streaming services easier than ever.

Broadcasters and rightsholders now have the tools and resources needed to seriously re-evaluate how they approach the acquisition of rights. The value of primetime live programming will always persist – particularly for high-value content such as the NFL football, The Oscars, Major League Baseball and top-tier European football. But the burgeoning streaming market calls for siphoning some live broadcast rights to a whole host of new content platforms.

Finding a flexible approach to live rights acquisition Separating live broadcast rights between social media and streaming platforms could create an engaging, tiered offering, maximising the value of the 'live' content with a VOD platform allowing for streamed and catch-up views.



We're already seeing this trend emerge with platforms such as Apple TV+ and Amazon Prime, which have recently acquired the rights to MLB and NFL, respectively. The content owner's D2C app could show clips in real-time, with streaming and social media apps offering an on-demand broadcast.

Near-live clips are where much of the value of live sports may reside moving forward and the faster content owners and rightsholders realise this, the quicker they can start monetising the process and growing their viewership. Media companies are already generating revenues from these applications through sponsorship, advertising and subscriptions.

Accessible solutions for the whole industry

While the development of the content continuum is shaking up the rights picture for major national and global sports leagues and top-tier entertainment event organisers, it is likewise impacting regional and niche events where, generally, the only content available is often from fans videoing and posting content themselves.

The fast-growing capabilities of cloud technology mean sports federations, teams, esports leagues, and other events organisers of all sizes and types can create their

own broadcast-quality content at a fraction of the cost of traditional TV production. They can create a gateway through which fans can consume either live streams or VOD assets, as well as highlights through an app or a social channel.

Consumers now want more control than ever over the live content that's available to them for all the content they view, and rightsholders of all sizes must evolve their business models to accommodate this change. Doing so also protects the future of this content by cultivating new audiences, reaching more platforms, and ensuring content remains relevant and engaging for the modern audience and younger generations.

This is not to say the media industry should wave goodbye to the live broadcast – far from it. But rightsholders must recognise we've gone past the point of no return when it comes to the popularity of on-demand highlights, clips, social media posts and game/match replays across time zones. The live event is simply the centrepiece of an entire content continuum of live and on-demand elements. By recognising how their market is evolving, leagues and rightsholders can open up new revenue streams, engage fans in new ways, and ensure their content remains relevant for the digital future.

latakoo

From the Sea to the Broadcast Center, Lessons in Agility

Running a production department at a major news network can be a lot like sailing a ship. Both can push leaders to sink or swim. A seaman turned news executive knows what it takes to keep things running smoothly even when the seas turn rough and unpredictable.

Applying skills learned on capricious waters as a young French Merchant Marine, Laurent De Rodez, Euronews' Head of Production & Post Production, has spent 20 years at the company running nimble operations, building strong crews and anticipating future needs to stay ahead of the curve and his competition.



Jade Kurian
co-founder,
latakoo

When he decided to move on from the naval service, De Rodez found the career that continues to keep him pivoting and moving fast. He began taking classes in video production, and eventually started teaching those skills to others. Then, came 'the business'. "I started in the TV business. And then I worked my way up to some responsibility in different companies," De Rodez said. Spending time as a post-production manager, he was able to transfer those skills into television news, first aiding video editing teams and later moving into the job he has today.



Laurent De Rodez leads Euronews production and post-production and has worked at the network for 20 years.

Euronews is Europe's leading international news channel, serving an audience of 400 million homes in 160 countries and available in 17 languages. With De Rodez' leadership in production and technology, the network has been able to navigate worldwide crises and uncertainties with the help of hundreds of freelance journalists who collaborate around the clock with the Euronews team members.

With more than 400 journalists spread across 30 different countries, Euronews relies heavily on strong remote capabilities, collaboration over borders and time zones and seamless production tools.

In 2017, NBC Universal sold its minority stake in Euronews to the majority owner, Media Globe Networks.

That was an opportune time for reinvention. The Euronews team carefully reconfigured its approach to broadcast journalism, but maintained its core operations. One of the most important areas for Euronews, though not fully appreciated at the time, was its remote capabilities. Long before many others in the business were harnessing technologies to make it possible, Euronews was making remote work part of their day-to-day workflow.



Euronews has a massive international imprint, serving 160 countries in 17 languages.

Accurately anticipating needs in the ever-changing news business has been a trademark for De Rodez and Euronews. Though they couldn't have predicted the



Euronews embraced a dependence on freelance content long before the pandemic.

pandemic, their early reliance on freelance journalists across Europe helped them through a critical juncture. De Rodez says the strategy paid off. In the early days of the pandemic when news teams around the globe were struggling to figure out how to produce news outside of their traditional newsroom environments, Euronews was already comfortable with the tools they had been using for a few years. One of the most reliable resources they had, according to De Rodez, is latakoo.

latakoo provides a seamless workflow for journalists and efficiencies for news agencies. Getting news from the field and on air is the way freelancers get paid. Making the process as quick and efficient as possible is crucial to their work supporting a round-the-clock news cycle. Created by two former news reporters (Paul Adrian and myself) a little over a decade ago, latakoo provides simplicity to a historically complicated process. We saw a gap that prevented reporters from being more efficient in their work and radically improved the process. “latakoo was like a miracle. There is a cloud-based storage where everybody can send content, share it and organize it. The files are available immediately after the journalist sends from locations around the world, and they also show up in our asset management system,” De Rodez said. With latakoo, journalists can quickly upload their footage in the field from their laptop and smartphones. Within seconds, the entire Euronews team has access to the files, and can immediately share the content on-air and online.

“Euronews is a special type of company that hires hundreds of freelancers. So, on any given day they may

have someone producing content who never previously worked for them,” said Paul Adrian, CEO and my co-founder at latakoo. “latakoo makes it super easy for freelancers to sign up for Euronews systems and to use their own technology to collect, shoot, edit, deliver and collaborate with their employer. latakoo meets these requirements.”

latakoo also offers an easy-to-use, but technologically robust mobile app for iOS and Android. Along with the LiveU app, LU-Smart, journalists who are working alone have the ability to create stories in the field with latakoo and go live from the field using LiveU. LiveU and latakoo are also integrated. That means a file can be sent using LiveU’s store and forward and land first in the latakoo cloud and end up in a user’s asset manager. According to De Rodez, his team pulls about 10 live shots per day from correspondents using the LiveU-Smart.

Today, Euronews is in good company. More reporters are working remotely than ever with a significant number of them increasingly being freelancers. Career website Zippia estimates there are more than 14,000 freelance journalists in the United States alone. The International Federation of Journalists says freelance journalism is no longer an “atypical” form of work. In some countries, the majority of journalists are freelancers.

Luke Hanrahan joined Euronews as a freelancer in 2019. Attracted to the network because of its huge footprint and reputation in the industry, he has continued to work for the company because of Euronews’ technological agility and prowess. “Using automation tools like latakoo puts



A freelance correspondent for international networks, including Euronews, Luke Hanrahan covered the deadly flooding in Western Germany in July, 2021.

Euronews in a good light for freelance reporters,” said Hanrahan. Hanrahan describes the latakoo experience in three parts: efficiency, intelligence and speed.

Efficiency:

“Every time I submit a package to Euronews as a journalist in the field, it automatically lands on their asset manager. Out of the news networks I have worked for, when you upload a file, whether that is a package or interview, often there is a person who needs to put that file where it needs to be. And that still happens at some major networks. Euronews has the ability to automatically put the file in the folder that it needs to be in for it to go on air. So, within a second of my package landing in the Euronews base in Lyon, it can be pushed on air. So, latakoo gives you the flexibility to do remote work and feel connected to the teams because they are able to access your material much quicker.”

Intelligence:

“latakoo itself is an intelligent tool. If you’re on a breaking story, you can upload material while you continue filming on your phone. So, say for example, there has been a major incident in central London and you just happen to be standing there at the time the major incident occurs, you can stop, pause and carry on. I can’t think of another kit that allows you to do that

– to be able to film while you’re uploading. That is pretty intelligent.”

Speed:

“Because of the technology that latakoo has within it, which is pretty unique, you can upload on one bar. Like when I was out at sea last year. I had one bar, and occasionally no bars and then occasionally one bar. You can drop in and out-of-signal and you are not having to restart the send as you would with pretty much any other technology including like the Live-U’s. I could do that safe in the knowledge that I could leave it all uploading in the background as I continued with my work. By the time I got back to the shore, what I needed to upload had already been uploaded. I hadn’t had to monitor it at all and that is pretty intelligent.”

De Rodez shares Hanrahan’s excitement for intelligent technology. He and his network have weathered the pandemic and other storms by embracing uncertainty and relying on just that kind of technology and capable crew members, including freelancers like Hanrahan, who will continue to supply a significant amount of content to fill their 24/7 news cycle. Having put in motion a system that uses technology and people that can quickly shift and change based on the currents, De Rodez and Euronews can keep sailing through fair or fierce winds.



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Hall 4 Level 2 & 8.F54
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Live Streaming Workflows for OTT: Guide to Moving to the Cloud

As the staggering growth of streaming viewership and consumption slows as indicated by Netflix's meltdown at the start of 2022, and HBO's (Crash of the) House of Dragons Premier in August 2022, streaming operators face one major challenge: ensuring streaming workflows scale both up and down. At the center is flexibility to cope with changing viewer demand patterns, who expect high QoE and are well versed in cancelling subscriptions and switching to a competitor. Moving to the cloud is a popular and excellent solution, but what are the true benefits? Should you move all components to the cloud? How do you transition efficiently without jeopardising QoE?



Brenton Ough
CEO and Co-Founder,
Touchstream

Current state of live streaming workflows

A streaming workflow seems simple: capture the video, compress, package (i.e. CMAF, HLS, DASH), ingest and transcode, and deliver it to viewers. In reality, we know it's much more complex than that.



Viewers demand high-quality streams with low latency and no buffering, and they're not forgiving if you fail to deliver. One error anywhere in your streaming workflow negatively impacts QoS, which translates to churn and ultimately loss of revenue. Further complicating it are different technologies, a lack of standardisation leading (data fragmentation), and, everything keeps evolving and changing. Streaming operators struggle for competitive advantages, and one clear trend emerges: moving live streaming workflows to the cloud.

Benefits of moving your live streaming workflow to the cloud

The current approach to streaming monitoring isn't flexible enough to track both hardware and software components; monitoring technologies need to be cloud-based as well.

Advantages of moving your live streaming workflow to the cloud



Virtualised versions of technologies, like encoders, allow you to shift costs to operational expenditures, and now only pay for a server as it's needed.

This contrasts with the industry's past heavy reliance on capital expenditure – acquiring physical encoders, servers, etc (and maintaining them) – when video delivery was by terrestrial lines or through physical media. The elasticity provided by the cloud unlocks these benefits:

- Better scalability
- Service reliability for viewers
- Greatly reduced maintenance
- Updates at a lower cost
- Get to market much faster: critical for competition

Should you move your streaming workflow to the cloud? Everything can be virtualised, but sometimes it makes sense to keep elements of the streaming workflow behind the corporate firewall.

Sometimes, it might make more sense to have initial encoding for a live stream happen on physical machines that can be more closely managed and aren't subject to the potential latency of cloud resources. The workflow might look something like a rack of encoders producing a master stream, then sending it to cloud-based encoding resources for transcoding and repackaging.



How to decide what streaming workflow components to migrate

No streaming operator is equal; here is a step-by-step guide to how to assess which components to move, how, and when.

1. Assess where you currently stand

Some companies are more advanced than others; maybe you just learned to adapt the cloud better to your streaming needs, or maybe you're already employing the latest cloud technology to leverage its full potential. Understanding where you stand in cloud adoption and usage right now is key to planning.

Cloud KPIs: adoption vs. usage

Understanding to what extent your organisation is "cloudified" is important for two reasons. First, it's strategic, because it helps you find how you can use cloud technology to improve the efficiency, resiliency, and performance of your streaming service long-term. Second, it's tactical, because it lets you identify how you can employ cloud technologies right now to improve your engineering efforts.

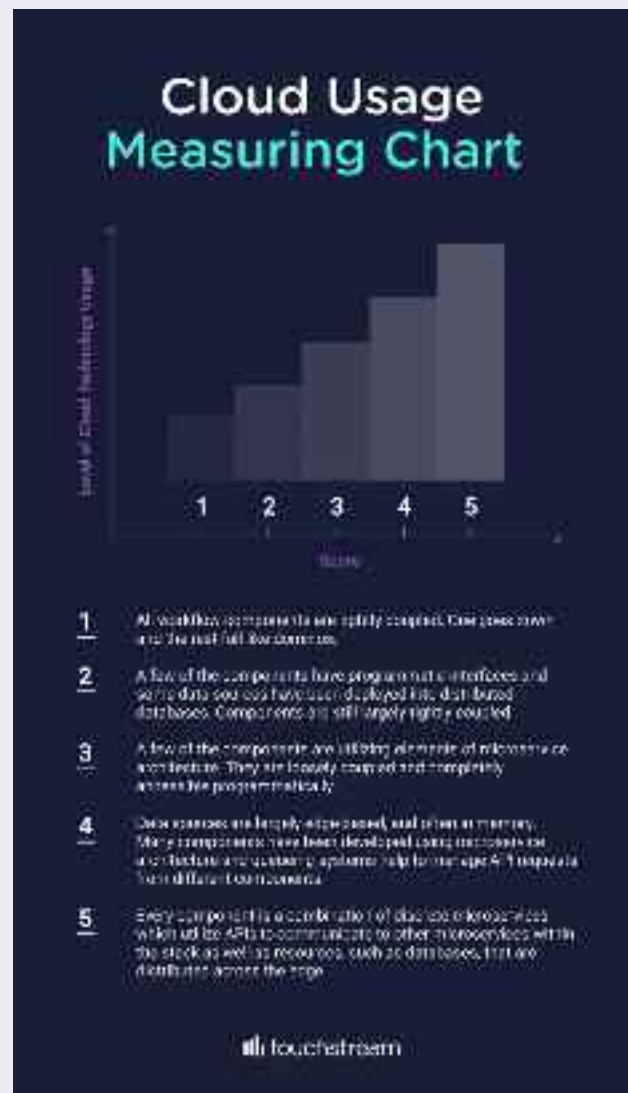
For example, moving from specific hardware, such as encoders, to virtualised instances can expose APIs which provide programmatic control over encoding functionality, ensuring improved scalability, resilience, and lower cost. This can result in better-engineered software.

Adoption matters too. The decision to migrate from server-based to cloud-based technologies is a strategic

one, but it doesn't dictate the way the cloud is employed in engineering efforts. It could be virtualisation or it could be [serverless functions](#).

Also consider usage. Even if the strategic decision hasn't been made to migrate to the cloud long-term, individual cloud technologies can be employed immediately to solve specific challenges or gain efficiencies within the workflow. Measuring how well you adopt and use cloud technologies will give you a clear picture of your immediate and long-term opportunities.

Measuring cloud adoption within streaming workflows Part of measuring adoption is technology selection. You could be virtualising components of the workflow or you could be embedding them within the very fabric of the cloud through serverless functions. They are both cloud technologies. To help you measure your adoption of cloud technologies, consider the following scale:



Measuring cloud usage within streaming workflows

Measuring usage is similar to measuring adoption. There are lots of ways you can utilise cloud technologies as part of the workflow – even if your adoption of the cloud overall is relatively low.



Using your scores to drive change

Combining the results of this subjective assessment with data from your streaming service, quantifies how cloud technology adoption and usage could impact your subscriber growth, user engagement, attrition, advertising revenue, and more.

If you see QoE and engagement data drop as simultaneous users increase, then by transitioning workflow components from hardware to cloud, from virtualised to serverless, or from traditional to [microservice architecture](#), you can improve those metrics.

Assessing cloud technologies

Before applying cloud adoption to your strategy or implementing cloud technologies into your workflow, it helps to assess the landscape. The best way to do that is a [tech radar](#).

A tech radar helps you bucket technologies into categories so your engineering teams aren't wasting time figuring out which technology to consider. It accounts for the current state of the technology within the market, and provides clear guidance across your entire organisation.

Imagine a tech radar for video stream monitoring. An AI-based approach might be in the Assess layer (because it's still not proven and there's a lot of iteration within the technology) while a microservice-based approach, such as Touchstream, might be in the Adopt phase. You can also utilise [Architecture Decision Records \(ADRs\)](#) to capture and document decisions so development teams and individual engineers understand why something was chosen.

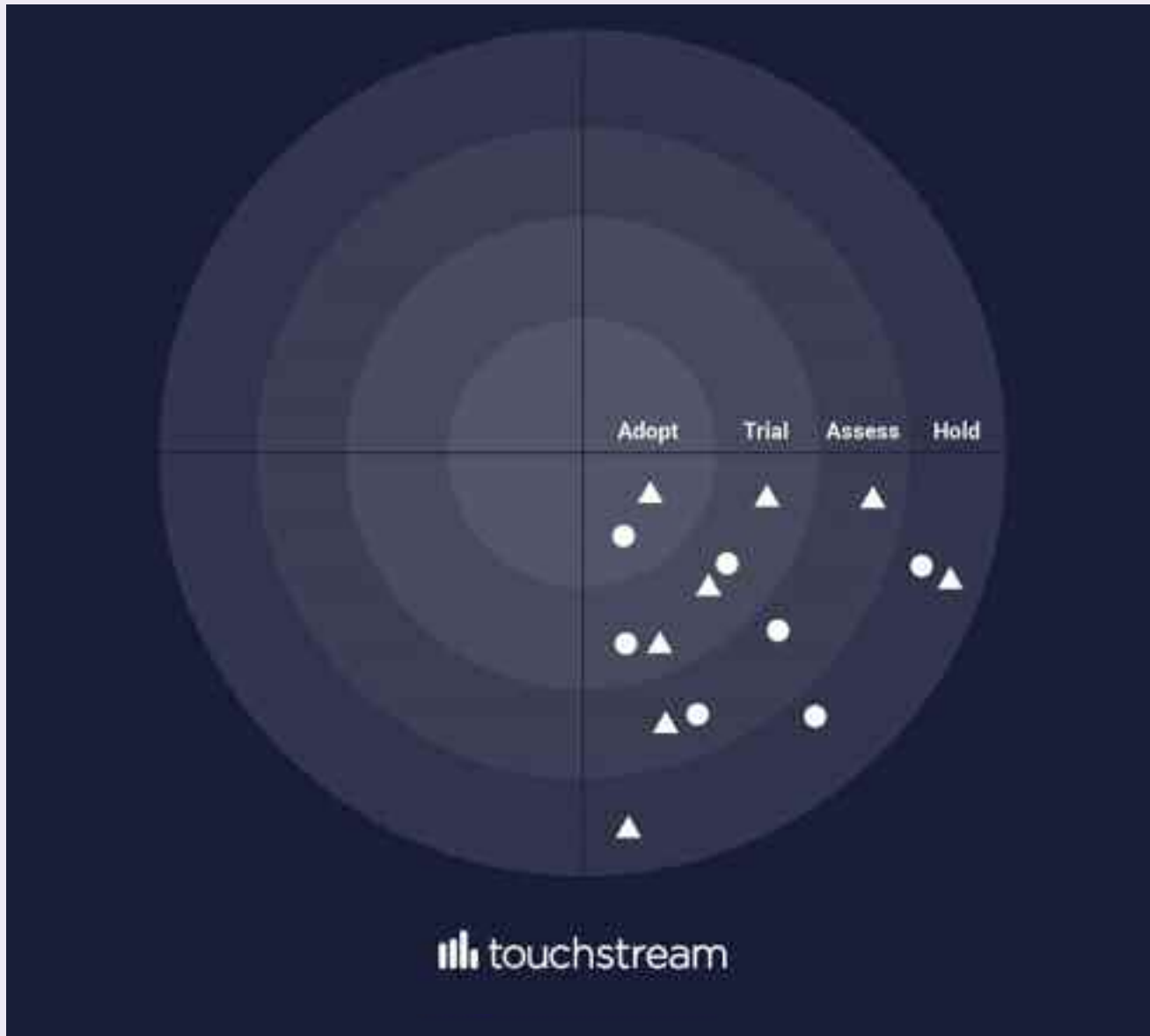
The key to successful adoption and usage

Any streaming operator can adopt cloud technologies in their stack, but making those technologies part of your streaming development efforts means everyone must be on the same page, with collaboration enabled by Tech Radars and ADRs. Moving in the same direction about developing within the cloud and with cloud technologies sees adoption and usage scores improve—and the success of your platform, too.

1. Check if migrating a component makes sense

The migration of streaming video components to the cloud, and from one cloud technology (such as virtualisation) to another (like serverless functions), is a natural evolution of [OTT streaming architectures](#). The architecture needs to be able to grow efficiently and effectively based on audience demand, but it may not make sense for a component to be virtualised, turned into a microservice, or even made into a serverless edge function.

The first step is to determine the operational benefit of migrating the component. Will it have a meaningful impact on key metrics such as video startup times, rebuffer ratio, and bitrate changes? Will transitioning the component make it easier to support? If the answer is 'yes' to both questions, then it makes sense to migrate.



2. Ensure you can still monitor it

The second step can complicate things: determine how to monitor the new version. When the migration is from hardware to software, or from software to cloud, significant challenges arise and could involve an entirely new approach (eg, replacing hardware probes with software versions; a type of transition in and of itself). Having a [monitoring harness](#) in place makes things much easier as the new version can be programmatically connected to the harness, enabling operations to continue using existing [dashboards](#) and visualisations. Without a harness, understanding the monitoring implications of the technology transition is critical to continuing migration. Not having a way to integrate the new version into existing monitoring

systems will make it more difficult to achieve observability. Once you've identified what workflow components to move to the cloud, the next step is to plan and determine how to execute the transmission.

How to Move Your Live Streaming Workflow to the Cloud

Read the [expanded version of this article](#), including an entire 1800 word section on [How to Move Your Live Streaming Workflow to the Cloud](#) on Touchstream's Blog.

To find out how to scale your monitoring operations with Touchstream's VirtualNOC, download our [Monitoring Harness White Paper](#) now.

Studio Network Solutions

Building Business Agility Into Your Media Production Workflow

I remember back in business school, professors would talk about 'business agility' like it was a badge of honor reserved for the best, most innovative companies. Now, it's a survival tactic – a flat-out necessity.

Why? For starters, COVID-conspired supply chain disruptions have wreaked havoc on industries from baby formula to semiconductors – and ours isn't immune. But business agility runs deeper than supply chain management.



Melanie Ciotti
Studio
Network Solutions

Consumers are growing increasingly less patient with inefficiency in their lives. If your product or service isn't constantly adapting to and anticipating their needs, there's no time for strikes – you're just out.

So, how can media teams stay agile and adjust to current and future trends in real time? It starts with an agile production workflow.



An agile production workflow helps media teams respond quickly to new opportunities and mitigate threats.

The Agile Production Workflow

Constantly uploading and downloading files off the server, passing hard drives from editor to editor, wasting creative resources on non-creative tasks – these are some of the obstacles that hold production companies back from business agility nirvana.

At SNS, we build solutions that enhance the post-production workflow so that media teams can create

amazing content, faster, from anywhere. Here are some of the ways our solutions can help you build an agile production workflow for your media team.

Standardizing On-Prem And Remote Workflows

Let's not dwell on the events of 2020 for too long, but the pandemic spelled out in capital letters just how agile our industry was at the time. (If you read that as a negative or positive, you know which side of the coin you were on.) Standardizing your video production workflow for on-prem and remote collaborators minimizes the burden on editors in a hybrid environment. And that doesn't mean compromising with egregious egress fees and latency issues.

The high-performance [EVO shared storage solution](#) includes several remote editing and cloud workflow tools to help creative teams find the optimal balance between high-speed online editing and flexible remote connectivity.

Creative collaboration powered by EVO blurs the line between your on-premise and at-home workflow. When connected to EVO remotely, your post-production team gains access not only to the media stored on the server, but also to the award-winning EVO Suite of software tools included: ShareBrowser for media asset management (MAM), Slingshot for workflow automations, and Nomad for remote editing.



EVO's remote cloud workflow solutions help media teams finish projects faster, from anywhere.

EVO makes remote access easy with [SNS Cloud VPN](#) – the secure, convenient, and ultra-fast virtual private network (VPN) service exclusively for EVO. Setup in minutes and 2x-5x faster than traditional VPNs, this cloud solution gives creative teams access to everything they need for their remote video editing projects just as if they were in the studio.

With EVO's remote/cloud workflow tools enabled, your on-prem and remote collaborators can:

- Search, find, and preview media in ShareBrowser
- Import media and metadata into their favorite NLEs
- Backup files to network-attached and cloud storage
- Automate file transfers, transcodes, and other data processing tasks
- Download edit-ready proxies for remote editorial
- Do all of the above, from anywhere

Automating Your Workflow

Content creators should spend the bulk of their time creating content. Unfortunately, non-creative tasks have a way of weighing down production workflows. Endlessly wading through files, manually transcoding media, and tying up workstations to run cloud backups translates to workflow inefficiency and low team morale.

Agile organizations don't dedicate editors and workstations to data processing tasks. They automate these elements of their workflow, keeping creative resources in their creative mindset as much as possible. This is where Slingshot comes in.

[Slingshot is EVO's built-in automation engine](#) and the soon-to-be most productive member of your production team. By automating your file transfers, media backups, transcode jobs, and more, Slingshot takes the busy workout of your workflow and off your team's to-do list.



ShareBrowser MAM features an AI connector for automatic metadata generation.

ShareBrowser MAM features an AI connector for automatic metadata generation.

Artificial intelligence and machine learning (AI/ML) are fantastic agility boosters, especially when seamlessly integrated into your workflow. [ShareBrowser's AI connector](#), for example, can automatically add relevant tags to your footage with the click of a button, making it easier for team members to find the clips they need without spending their time logging those tags themselves.

Being open to new technologies that save time in your workflow enhances your team's ability to react swiftly to emerging opportunities, trends, and threats. It's the ultimate catalyst for an agile production workflow.

How Workflow Agility Breeds Opportunity

A truly agile workflow helps production companies identify, execute, and even monetize new business opportunities.

For example, Barbershop Films uses EVO and ShareBrowser as a client-facing media portal, adding more value to their footage beyond the final deliverable.

Jeremy Drummond, president at Barbershop Films, explained: "You spend \$300,000 to shoot a 2-day commercial campaign, and that footage is great. It's done, it's got its 13-week run, it's measurable. We did everything we're supposed to. But now with EVO, we've unlocked all this value in those shots that didn't make the cut – in the additional angles that are great in a social piece, or powerpoint, or a pitch deck. We can leverage that and offer it to our enterprise clients as additional value for their investment."

When you remove the physical walls constraining where creative professionals can work, stop wasting creative resources on non-creative tasks, and invest in technology that breeds new opportunities for your team, you've mastered the agile production workflow.

Learn more about EVO shared storage and the included EVO Suite of workflow tools at snsevo.com.



Barbershop Films' post-production workflow is powered by EVO shared storage.

Spicy Mango

Fast and furious: why speed and agility are key to keeping streaming audiences (and shareholders) happy

When the CEO of Netflix forecasts the [death of linear TV within the next 5-10 years](#), the growth plans of legacy providers suddenly take on added urgency. Critics argue that the 10-year prediction is – if you'll pardon the pun – a little OTT. However, while the timeframe may be questionable, the direction of travel certainly isn't. Right now, everyone's on a journey to OTT. Getting there quickly requires an organisational agility that's, at present, rare. So how do you develop it? This article sets out some key considerations.

But first, let's establish some context. The OTT market continues to expand as a slew of major brands prepare to enter the space. Despite evidence that subscription growth is slowing, the streaming video (SVOD) market continues to climb – with [global subscriptions tipped to reach 1.7bn by 2027](#). At the same time, revenues from ad-supported streaming (AVOD) are [expected to double in the next five years](#) as established players [flex their models](#) in response to consumer need. New formats are gathering pace too, not least [FAST \(Free Ad-supported Streaming TV\) channels](#) – linear streams accessed via electronic programming grids that allow viewers to join broadcasts in-progress. FAST channels are [growing rapidly](#) as consumers look for low-cost linear alternatives to TV.

The turbo-charged prelude

Make no mistake, Reed Hastings is right: there's a road race to OTT and everyone's hammering on the throttle because they know the clock is ticking. However, the race for the finish line isn't straightforward, with many discovering the course is full of roadblocks. In particular, traditional providers – challenged by the imperative to embrace a new delivery model whilst at the same time maintaining legacy business – are finding the transition tough. Some, despite their best efforts, don't have the capacity, the human capital or – crucially – the agility to get there quickly.

It isn't easy. OTT delivery is like a never-ending action movie: it's Fast and Furious. OTT journeys routinely travel through blind corners and lightning-quick chicanes that can easily crash the user experience (UX). Surviving them

requires speed and agility. With UX key to retaining subscribers, failure to react quickly to problems can lead to an exodus of customers that's difficult to recover from. Bottom line: if you don't respond Fast, your customer may end up Furious.

The challenge for traditional providers is that OTT and broadcast media are two entirely different races – and trying to pivot from a fixed infrastructure to a more flexible environment requires a different skillset and an agile mindset. It takes time – but time's running out.

The best OTT experiences are nimble and efficient. Sport is a great example of this. If you want to be a sports provider in the OTT space your environment simply has to be agile. Pay-per-view sport typically attracts a massive peak in demand in the lead up to an event as users sign up, with demand subsequently tailing off into a steady state as audiences settle down to watch. That sudden influx just moments before kick-off presents significant challenges. If you haven't built an infrastructure that has the capacity to flex up and down in a smooth, quick fashion, there's a good chance that when users tune in they'll quickly be greeted with a 503 or 504 error, "Out of Resources" or "Gateway Time-out". That's the end of the road for the customer experience. Sports provision is unforgiving: if a customer misses kick-off, they invariably don't return for the second half (both literally and metaphorically).

These challenges translate across all types of content. So how do you avoid them? The solutions are rooted in good engineering.



Engineering issues typically occur when organisations don't fully understand how the various components in the OTT delivery chain interact or can't identify the specific components that are causing them issues. Given the polarity between legacy and OTT environments, these gaps in knowledge are entirely understandable – but addressing them is key.

The fast-track to success often comes from working with a tech agnostic, independent partner that knows how the myriad components – sign-up, entitlements, restrictions, billing, payment systems etc – work together in the back end, and can show you which are most likely to be creating bottlenecks. From there it becomes easier to design solutions that de-risk potential problems and provide the speed and agility to flex at scale.

The Fast Saga

So how do you build the agility to support the rapid deployment of OTT services?

Fundamentally, agility is a mindset that pervades every aspect of an organisation and its products. When it comes to delivering OTT services, there are three core components of a business where agile thinking must be part of the DNA.

#1. Infrastructure/architecture

Infrastructure design is the start-line of the race. If your engine isn't wired properly, you'll struggle to move through the gears. It's important to plan for the whole journey. Many companies make the mistake of designing for the 'happy path' where everything works well. But what happens when things go wrong? Because they will. Smart organisations are proactive, identifying 'edge case' problems that could potentially occur and engineering their architecture to address them from day one. You cannot predict them all but a number can easily be catered for up front. For

example, what do you do when payment or geolocation services fail? What happens when you have a spike in customers or internet capacity issues? What do you do when one of your vendor services crashes and customers are being blocked from entry?

There are countless problems that can (and will) crop up. Many can be de-risked with agile, up-front thinking. Most organisations don't think through all the potential scenarios. Those that do typically end up with an infrastructure that has a certain amount of agility in-built to cope with the everyday stresses of OTT delivery. That invariably leads to better engineering, a better user experience and happier customers.

#2. People

Organisations are at full stretch. Most are operating with small teams that don't have the capacity to suddenly switch focus to deliver new projects, yet businesses are demanding rapid advances towards OTT. Unfortunately, many don't have the people, the skillsets or the agility in-house, but the pace of change is accelerating faster than they can recruit. This is preventing companies from getting new products over the line, impacting everything from infrastructure and architecture to UX and UI design.

The most effective leaders recognise they don't have everything they need in-house and are open to working with partners that can provide the speed, agility and expertise they're missing. This agile mindset is often determinative to executing plans and meeting customer and shareholder expectations.

Agile partners can often be deployed on a short-term or project basis, either supplementing delivery teams or working as an independent unit. The most effective adapt to the culture and needs of the client business, providing flexibility and expertise to support the rapid deployment of OTT services.

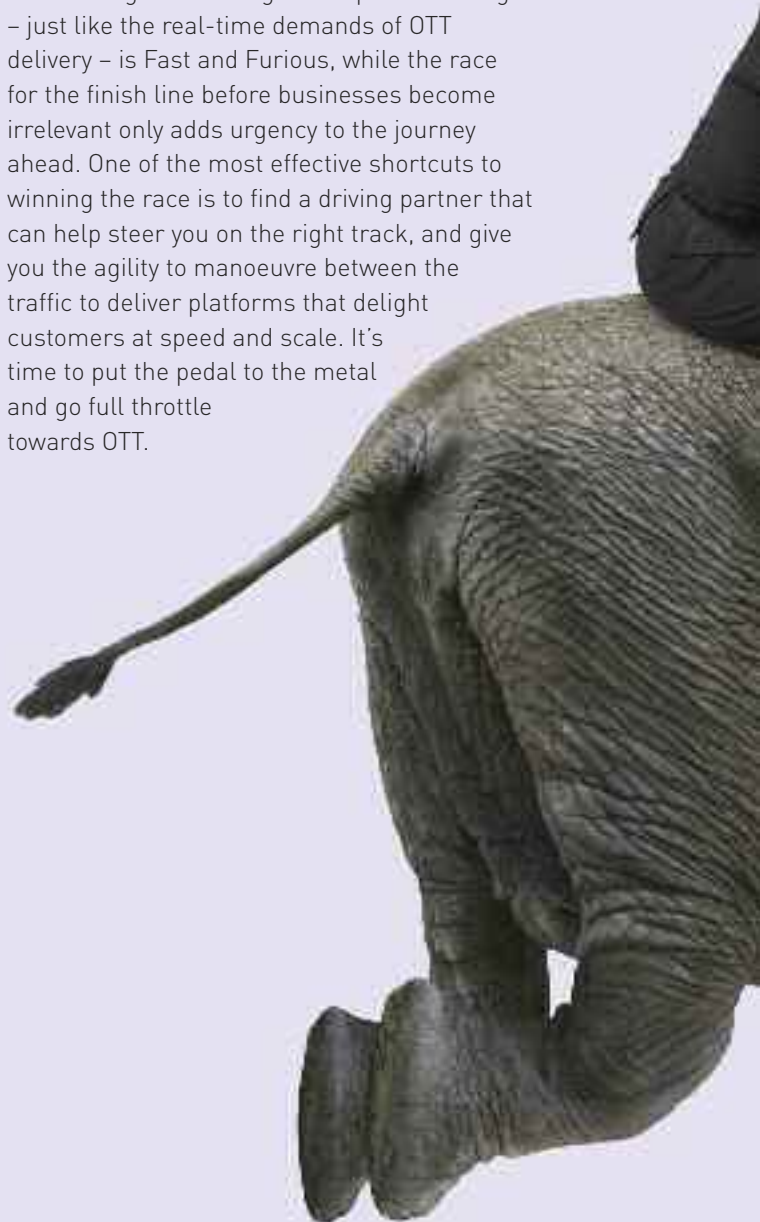
#3. Financial modelling

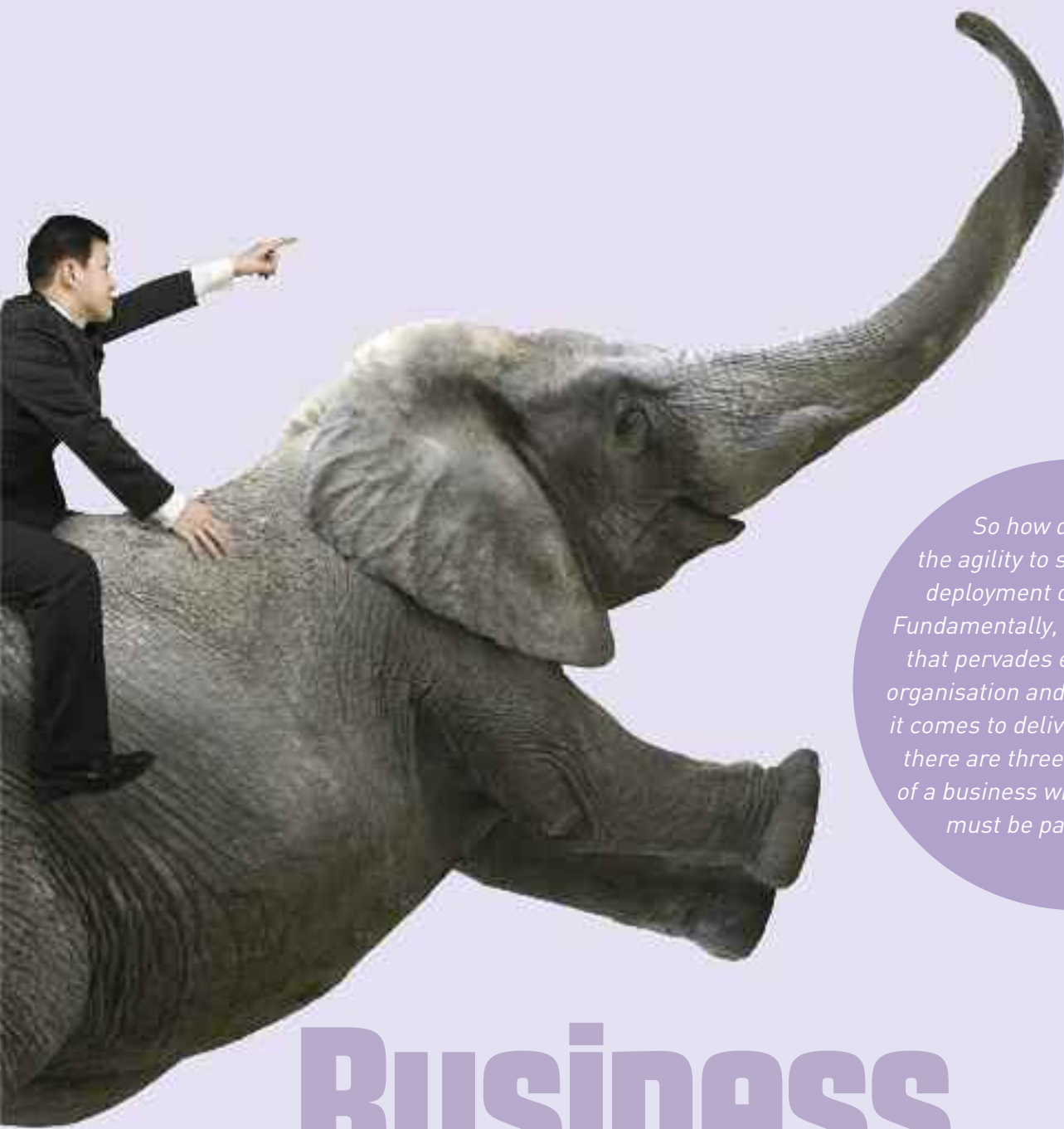
Companies are becoming much more open in how they model their financing for tech projects. Whether it's CapEx, OpEx, software-as-a-service or something more customised,

organisations have recognised that the nature of tech services has evolved and the way that they pay for them can enhance their agility. The best approach is not to be too fixed in your financial modelling but instead ask yourself whether the stuff you're buying is core IP for your business. If it isn't, it's worth considering options that give you the flexibility to change direction as the business or market evolves.

Shortcut to success

The road to OTT is like a high-speed action movie fraught with danger. The pace of change – just like the real-time demands of OTT delivery – is Fast and Furious, while the race for the finish line before businesses become irrelevant only adds urgency to the journey ahead. One of the most effective shortcuts to winning the race is to find a driving partner that can help steer you on the right track, and give you the agility to manoeuvre between the traffic to deliver platforms that delight customers at speed and scale. It's time to put the pedal to the metal and go full throttle towards OTT.





So how do you build the agility to support the rapid deployment of OTT services? Fundamentally, agility is a mindset that pervades every aspect of an organisation and its products. When it comes to delivering OTT services, there are three core components of a business where agile thinking must be part of the DNA.

Business Agility

Manage and Publish

In this issue of Journal we are featuring articles from IABM members who operate in the Manage and Publish segments of the BaM Content Chain®, covering the latest developments in preparing and managing completed content and its publication, including playout of linear and non-linear content, and orchestrating the workflow and resources required.



THE BaM CONTENT CHAIN®
from **Creator** to **Consumer**

Broadcast Traffic Systems (BTS)

Responding to Churn: Are Ad Supported Services the Answer?

The subscription video on demand (SVOD) market experienced a huge surge in demand during the pandemic, as people under enforced lockdowns signed up for streaming services in their masses. However, as people return to their pre-pandemic routines, whilst simultaneously having to manage an increased cost of living, many are choosing to reduce the number of paid streaming subscriptions that they are signed up to.



Craig Buckland
Technical Director,
Broadcast Traffic
Systems (BTS)

This is having a big impact on the global SVOD market. As a case and point, in the first half of 2022, steaming giant Netflix lost almost 300K subscribers globally, and according to data recently released by the [Broadcasters Audience Research Board](#), in the UK, there was an overall decline in the number of households accessing SVOD services during the same time period. This upward trend in churn rates has led streaming platforms to consider adapting their offering to reduce or remove subscription fees by offering ad supported services.

The Rise of AVOD

Advertising video on demand (AVOD) differs from SVOD as revenue is generated from ad sales, rather than subscription fees. As consumers increasingly search for ways to reduce their outgoings, churn is becoming a growing concern for SVOD providers. Consumers are gaining more tolerance for advertising, especially if it means they can



access their favourite content for free. As streaming services look to retain and attract subscribers by reducing or removing monthly fees and offering more choice in the level of service available, it seems likely that we will see an increase in AVOD services. Service providers may also choose to opt for a more blended approach involving limited ad delivery with a reduced subscription fee. This is something that Netflix have recently announced as a means to prevent churn and attract new subscribers.

According to research carried out by [Rethink Technology Research](#), AVOD is projected to grow from 6.81 billion active users today to over 8.62 billion by 2027, with the corresponding advertising revenue projected to grow from \$50.18 billion to \$91.36 billion in the same period.

Better advertising targeting made possible through advanced audience analytics has undoubtedly improved user experience for AVOD audiences. This improved user experience, combined with a desire to reduce subscription fees has made the AVOD model much more attractive to both users and broadcasters alike.

Although offering an ad supported option may seem like the obvious solution to broadcasters who are looking to respond to churn and increase revenue, ad delivery is a complex process and can present some significant technical challenges if not managed correctly.

Effective Ad Management

Managing broadcast ad delivery and ad sales is a complex area, largely because of the different processes and systems involved, that all need to be integrated into the broadcast workflows. Advertisers naturally want maximum return on investment and that requires targeted advertising, so being able to provide advanced audience analytics is critical for any broadcaster wanting to maximise revenue from advertising sales.

Audience analytics needed to sell advertising spots includes planned audience numbers and audience demographics. Therefore, for an advertising management system to be effective, it needs to be integrated with audience research systems. In addition, ad management systems also need to interface with digital agencies that buy and sell advertising space such as Google Ad Manager and FreeWheel.

Broadcasters also need to be able to effectively manage the ad delivery process so that placement rules and requirements agreed with the advertiser are met, and ads are tracked to verify exactly what advert was shown, at what time, and under what circumstances.

It can be difficult to find an ad management platform or solution that meets both the broadcasters' and advertisers' requirements. The process is further complicated when dealing with multiple channels, and when broadcasting across different regions. The multi-layered systems involved in managing ads mean that lack of interoperability can and will cause significant problems.

The right tools can bring greater control. When it comes to managing advertising delivery and sales, providing the right tools are in place, bringing the process in-house can be hugely beneficial to broadcasters. By integrating ad sales with existing broadcast workflows such as the channel management process, broadcasters can benefit from improved efficiency, and greater control over the ad sales process.

Advanced advertising solutions should allow broadcasters to manage the entire ad sales process remotely without compromising on functionality. An effective ad sales system



enables broadcasters to maintain high level proposals and sales contracts, optimise bookings, cater for single or multiple channels, and support the placement of spots whether through gross rating points (GRPs), or via individual spot booking.

Flexibility and Interoperability

In any fast-moving industry, it is important to be able to respond quickly to market changes, as well as to customer and user needs. The media and entertainment industry is no exception. Having the capabilities to scale up or down as business needs require is essential for longevity and success. High levels of flexibility are required at all stages of the broadcast process workflow, including ad delivery and management. Greater flexibility can be achieved from a modular channel management and ad sales system that allows the broadcaster to select the features and functions that are required by their operation.

In the age of cloud working and APIs where broadcasters select different vendors and tools for different workflow elements, it is critical that any ad management solution can integrate seamlessly with other systems within the broadcast workflow.

The future looks to be AVOD

Although the pandemic caused global ad revenue to dip in 2020, sales have since recovered and are predicted to continue to increase year on year. According to data published recently by [Statista](#), global ad revenue grew to \$772.41 billion in 2021 and is projected to reach a staggering \$1,075.38 billion by 2027.

Ad management can be technically challenging, but with the right tools in place, the process can be managed effectively and efficiently. Combine this with the fact that advertising will always be a crucial marketing channel for brands, and it is clear that AVOD is a sustainable business model for the long term.



Etere Ecosystem Redefines a new generation of content publishing with a strategic software-driven workflow

Etere Ecosystem streamlines the content supply chain, including playout of both linear and non-linear content. With one system, you can manage the end-to-end workflow effectively. Etere Ecosystem is a fully customizable software solution that can manage your end-to-end media workflow with integrated and automated workflows to manage business processes, leading to better cost-efficiency and productivity. It features a sophisticated architecture with direct archive and database communication.

Simplify with Workflow Orchestration

Etere Ecosystem orchestrates the processes and resources required, from management and preparation to content publication. With automated and customizable workflows, Etere brings you a breakthrough in efficiency and flexibility. Furthermore, it provides perfect synchronization between workflow actions. Etere T-workflow features a workflow designer for a fully personalized and reliable way to create or modify distinct broadcasting procedures. It allows the simultaneous execution of multiple independent actions automatically, based on pre-configured criteria. Monitoring and managing your media assets have never been easier.



deliver advertisements that are more relevant and in tune with the viewer's profile. Etere Ecosystem opens new media monetization opportunities to drive remote ad insertions and tap on advertising opportunities in different markets for an enhanced return on investment in content and advertising revenue.

Actionable Business Analytics

With real-time data driving actionable business intelligence, users can strategically plan and make informed decisions about viewer engagement and content optimization, including targeted advertisements. Etere Ecosystem analytics dashboard empowers content distributors with viewability, interactivity, and viewership data. The accessibility of Etere Web makes it easy for distributed teams to collaborate and access data in real-time on a centralized database, even while on the move.

Dynamic Ad Insertion with SCTE Triggers

Etere Ecosystem manages Dynamic Ad Insertion (DAI) and Digital Program Insertion (DPI) to deliver targeted commercials to reach consumers across different markets and to increase its content monetization revenue. With SCTE triggers for dynamic advertising, content producers can broadcast customized commercials driven by data analytics and advanced metadata. In addition, with the insertion of Flexi-metadata, commercial delivery can be targeted on multiple levels, including geo-localization, demographics, device type, and media consumption preferences. With the same program, broadcasters can insert different advertisements to targeted markets. These capabilities enhance the viewer experience for OTT content delivery as it allows service providers to

Flexible and Multi-Bitrate Encoder

Etere Multi-Bitrate Encoder offers integrated advertising management with SCTE and Google Dynamic Ad Insertion markers for OTT advertising.



As content delivery requirements evolve, Etere consistently enhances its technology to empower broadcasters with the leading-edge technology to leverage content monetization opportunities in the market. Etere Multi-Bitrate Encoder is released as a simplified platform to efficiently manage OTT workflows and ad insertions through a streamlined workflow. Powered by GPU, Etere has a very low CPU impact to deliver multiple streams of multiple resolutions and bitrate to match the receiver capabilities. It integrates the recording of video signals (SDI/IP/NDI) and encodes the recordings into HLS-compatible files in multiple resolutions.

Professional Quality Playout with a Smaller Footprint

Etere ETX is a complete software-defined Channel-in-a-Box featuring all the capabilities needed to bring a channel live, including full IP/NDI/SDI (in and out) for multiple frame rates. As a software instance on commercial off-the-shelf (COTS) hardware, Etere ETX delivers an integrated playout, master control, closed captions, and graphics on a single interface. ETX has playout features needed to bring a channel on-air, including cloud playout, ingest, automation, master control, and interactive graphics.

Virtualization and Cloud

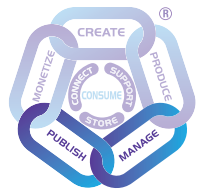
Etere streamlines your workflow with integrated support for virtualization and the cloud. Etere provides a virtual environment for unlimited streams without the associated hardware costs.

Streamlined Insertion and Management of Secondary Events

Etere STMAN supports even the most complex event structures involving multiple layers of graphical elements such as logos, crawls, subtitles, and channel branding, as well as device commands such as script, hex pass-through, and channel switch. As OTT advertising workflows are more efficient, they are no longer disconnected or separated from the broadcast streams.

Etere OTT Delivery

TV viewing habits have changed considerably, and increasingly, audiences want the option to watch their favourite programs on their preferred devices and at the time they choose. This shift poses a new set of challenges for broadcasters. In addition, media convergence brings with it a new way of monetizing content. To optimize delivery efficiency, Etere Over-the-Top Delivery provides the most efficient software tools to manage the distribution of OTT content to all popular media platforms.



A user-friendly interface enables users to create delivery orders where all conditions can be specified from the distributor, platform, metadata, and materials to the workflow to automatically adjust content to the technical requirements of a specific platform and transfer packaged files where needed. The integrated system is managed with a single Media Asset Management and can quickly produce multiple streams of customized content. Each stream can have ad insertions in the form of secondary objects, including squeezes, overlays, and animated logos. Etere Ecosystem opens up a world of opportunities for advertisement placements, allowing you to have a higher return on your assets for both linear and OTT delivery.

With Etere, you can distribute content over various media platforms, including Netflix, Hulu Plus, Amazon Prime, Redbox Instant, Vudu, Vodafone TV, CanalSat, Orange Nouvelle TV, and more. The integrated platform includes the management of licensing rights and defines the contractual agreement for each media file, even for databases numbering in thousands. Etere T-workflow automatically triggers the delivery workflow appropriated to automatically adjust content to the technical specifications of a particular platform. Etere ensures complete compliance of all delivered materials according to the technical specifications required by each specific OTT platform.

It also integrates real-time payment tracking of content produced, enhancing flexibility through automation. Etere Ecosystem has helped broadcasters worldwide improve the distribution and monetization of their OTT content by significantly automating material packaging and cutting delivery times.

Stay Ahead of the Game with Etere Ecosystem

While content monetization technologies are changing with viewers' increasingly fragmented content consumption habits, you can stay ahead of the game with Etere. Etere Ecosystem's integrated, customizable and cost-effective solutions allow you to drive higher revenue and

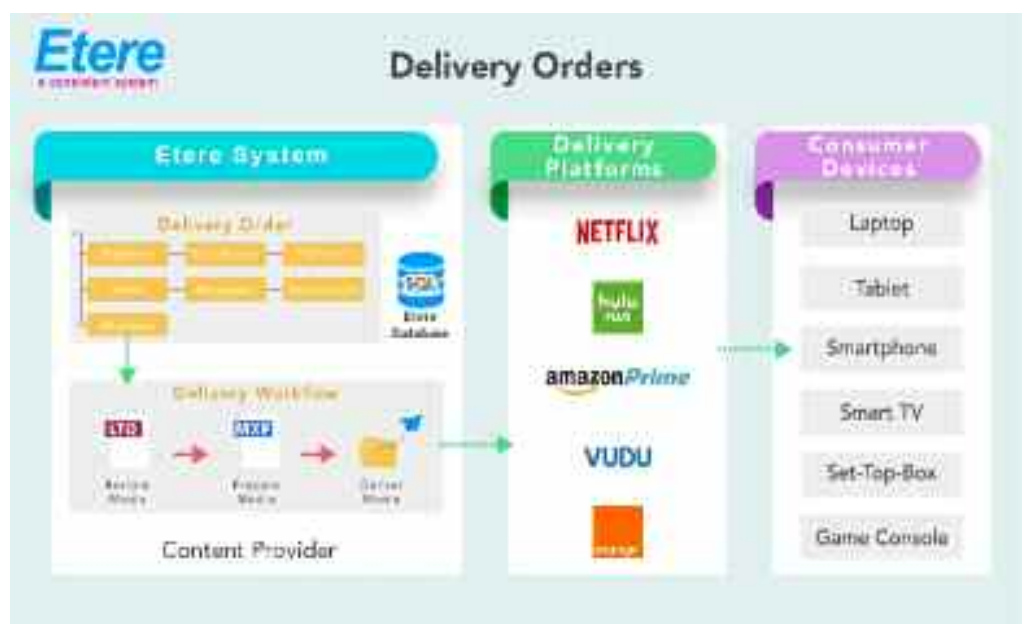
deliver an enhanced viewer experience. With Etere Ecosystem, content owners can drastically reduce the complexity of creating and delivering linear and non-linear channels.

About Etere

Since its beginnings in 1987, Etere has been preparing users for the future. Etere is a worldwide provider of broadcast and media software solutions backed by its mark of excellence in system design, flexibility, and reliability. The revolutionary concept of the Etere Ecosystem promotes real-time collaborations and enhances operational efficiency across the entire enterprise. Etere Ecosystem software solutions manage the end-to-end media workflow and feature an integrative Web and Windows architecture that is customizable to fit perfectly in any system.

Etere delivers on its service excellence commitment with 24/7 worldwide support and inclusive software updates. Its portfolio of digital technologies and market-proven remote/on-site services such as consultancy, training, installation, and demonstrations are ready to run with your business no matter where you are. Etere enhances your adaptability for the future and empowers you with the most innovative software tools to drive your business to greater heights.

To find a media management strategy that works for your business, visit www.etere.com.



Caton Technology

The consistent route for IP contribution

While there seems like an infinite amount of content available on demand, the pinnacle of the broadcast (and now streaming) industry is live broadcasting. Sport is the most obvious source – a UK sports broadcaster is using “it’s only live once” as its tagline at the moment – and big events like the Olympics and the FIFA World Cup can draw audiences of close to a billion worldwide.



Karl So
*Vice President, Products,
Caton Technology*

But sport is not the only source of live broadcasting. There are plenty of music and entertainment events which are appointment to view: think of the main stage at Glastonbury, or the finals of major reality competitions like Love Island or Big Brother.

Whatever the genre, live broadcasting means getting the content from the location to the broadcast centre. In the case of international events, to many geographically diverse broadcast centres. And, of course, today we expect much more than just a single feed from the event, so the number of circuits grows quickly. The ultimate goal is true remote production, with the cameras and microphones on site and all the production – switching, replays, graphics and commentary – back at base.

But it is only live once, so all these links have to stay live throughout the whole of the event. How can we provide this sort of capacity, reliability, and connection from anywhere to anywhere?

The traditional answer was satellite, but it does not have the capacity for all these requirements. The situation will get worse in time, as the spectrum for C-band satellites is transferred to 5G and future cellular communications.

Major permanent venues will have dedicated, point-to-point fibre installed, although not necessarily with enough bandwidth for large numbers of feeds. For other venues, planning and installing dedicated fibre is a lengthy, disruptive and expensive business.

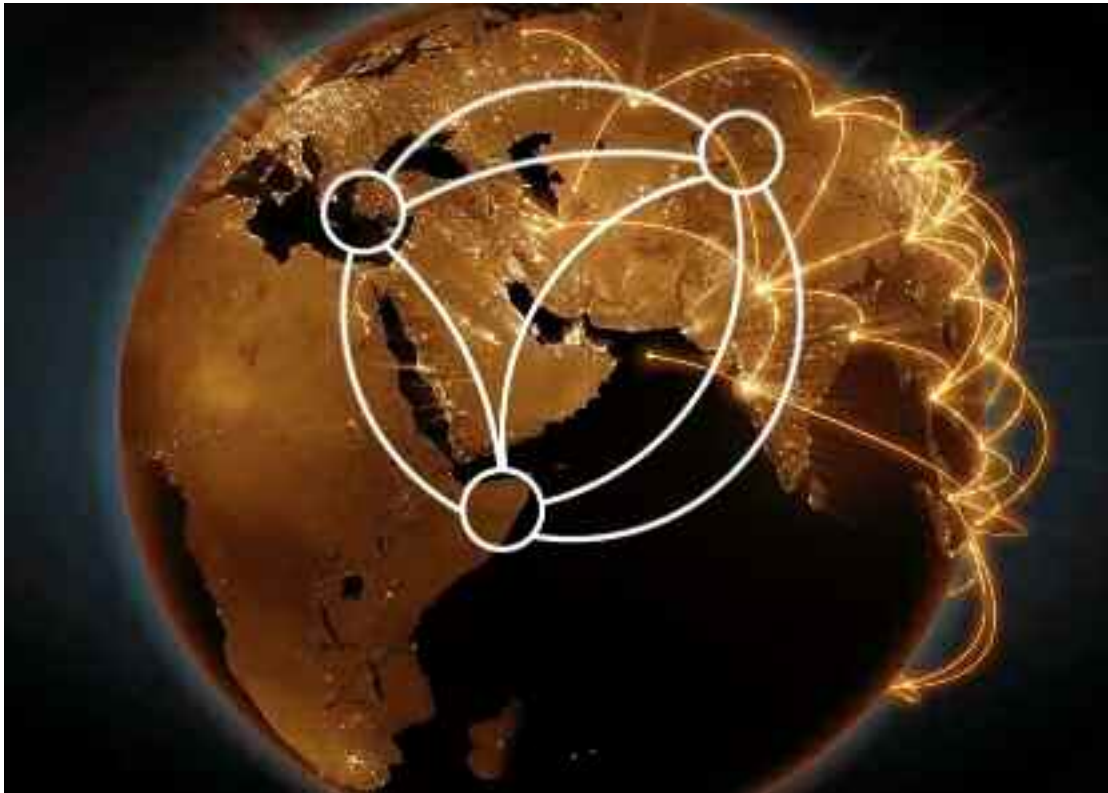
In either case, the carrier will have invested heavily in its installation, and will want to see a return. Even if a fibre from a football ground to a broadcast switching hub is used for a game every week, that is still only 2% utilisation, which means the fee must be very high when you do need it. Carriers will also insist on long-term contracts: years rather than weeks.

There is a simple solution: the public internet. Find the capacity, and just pay for what you use. This is not as difficult as it sounds: most sports venues are in metropolitan areas, where there is likely to be plenty of dark fibre connectivity available. With the right systems, you simply camp on to the capacity when you need it; release it as soon as you are done.

The problem with using the internet for professional video communications, of course, is that it really was not designed to provide the level of consistency and security we require. The internet is not deterministic: we need 50 new pictures every second. Oh, and we want to achieve this high performance, deterministic connectivity with the absolute minimum of latency.

This is where you need specialist video services, to guarantee the high quality and low latency we expect. It calls for a transport layer to provide the determinism and stability, which must also be capable of working with any of the standards currently in use.

This transport layer needs special facilities to ensure that the deterministic video signal gets



through unscathed. That means bespoke algorithms, backed by machine learning to get the best out of each individual circuit. Those algorithms, in turn, will support at least the most common of the video streaming formats in current use, including NDI and SRT as well as SMPTE. Native support eliminates the need for additional transcoding stages which introduce latency and add points of risk.

A good transport layer will also use sophisticated dynamic forward error correction (FEC), to minimise disturbances. As the name implies, forward error correction sends certain signals in advance of the main stream to assist recovery should there be a glitch, which means FEC inevitably adds latency. A well-designed system will allow users to fine-tune the balance between signal resilience and latency.

To protect the intellectual property in the video, the stream must be secured in transit. The most widely respected scheme is the Advanced Encryption Standard, generally shortened to AES (but not to be confused with the Audio Engineering Society and its digital standards).

Finally, all this must be implemented as a plug-and-play option, so it can be set up quickly and with the minimum of specialist knowledge, and a Service Level Agreement (SLA) with 99.999% availability for full assurance.

We have created a uniquely powerful solution which meets these requirements, the Caton Transport Protocols (CTP), now comprehensively proven and in regular use by major productions and broadcasters. It points the way to a future where contribution circuits routinely use the IP connectivity that is available, layering on it the security, predictability and reliability the broadcast and media industry demands.





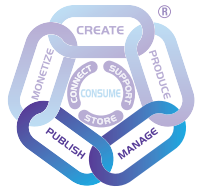
Codemill

Navigating Common Metadata Challenges

As the Video-on-Demand (VOD) market becomes increasingly competitive, the customisation of the viewer experience has become a key differentiator for media organisations. Viewers have come to expect a highly personalised service: the importance of both great User Experience (UX) and a simple path for content discovery can't be overstated. Linear channels are also storing more content assets, both archive and new episodes, in the cloud. To ensure content supply chains are running efficiently and to streamline scheduling, content owners need to efficiently tag and track key information about their media.



**Lucia
Johnstone-Cowan**
*Senior Sales Manager,
Codemill*



Metadata plays an important role in this, but there is often a feeling of "more is more", a sentiment that can and does cause challenges further down the line. The over-proliferation of metadata collection can obscure the objectives for gathering it in the first place, but the process of collating 'good' metadata is not always simple. There are a number of challenges that arise when collecting and managing metadata on a mass scale, such as informational silos, the needs of different content supply chains, and metadata standards. If not managed correctly, these issues can all feed into a sense of metadata fatigue.

The role of metadata

Put simply, the purpose of metadata is to enable media businesses to make the most out of their content, whether that content is used for on-demand platforms or for linear broadcasting. Content owners and broadcasters now have unimaginably huge catalogues of media that need to be identified and categorised for effective search and discoverability. In addition, now that older content from the archives is being leveraged for monetisation purposes, there is a huge need to identify and categorise not only new media assets, but

also older material in the archive. This process will benefit both the end-consumer and the media operations user.

Metadata also has an important role to play in linear broadcasting, when broadcasters need to change scheduling at the last minute, or to remove certain content, or pull whole shows. This may happen when there are sensitivities over a particular political incident or recent news event. As well as being crucial in those kinds of time-sensitive situations, effective metadata is also vital when compiling a collection of particular content from an archive. This could be a compilation focused on a specific person or a theme. Let's say an actor wins an award and a broadcaster wants to collate past appearances, interviews and other notable points relating to the actor's life. To do that quickly, metadata needs to be accurate, effective and searchable.

Metadata management

Media businesses typically have lots of different types of assets, each with a range of associated metadata, and managing this is, unsurprisingly, a complex process. In order to manage a media-rich archive at a granular level, media companies really need a MAM system in place to index their catalogue successfully. Then they can run searches, screen the archive, and do things like marking clips and captioning audio descriptions for tagging. Without effective management of the search, annotation and indexing processes, the media archive will quickly become unstable and siloed.

If the metadata recording system isn't integrated with the whole media production process, there might be a need to use different systems to track different types of content, which is obviously unsustainable because the archives are all interrelated. Not only is this inefficient in terms of duplication, but it can also lead to the proliferation or duplication of metadata about the same person, object, or theme.

Without using a MAM with an intuitive search capability that enables the user to handle, mark, track, and publish rich metadata at scale, the metadata is going to be an inconsistent mess. In that scenario, you would likely see some metadata hosted in one place, some in another place, some that's only attached to the subtitles or audio description files, some that's only attached to one episode in a series, and some attached to each and every episode. It is critical to have a strong search capability at the core of any MAM system.

Good metadata vs. bad metadata

Good metadata is useful metadata, which has a clear purpose and has been collected with clear objectives in mind. Good metadata is about getting to the core of what is really needed. Some metadata is needed for the user to easily discover content, while other metadata is needed because it is useful in the MAM for the media production process.

It is fair to say that any metadata is useless unless it has a purpose. If unnecessary metadata is being logged, it can obscure the useful metadata, making the search process more difficult. In this way, unhelpful, excessive, or duplicated metadata can actually become a hindrance.

Informational silos

There is also an issue of metadata not always being shared both interdepartmentally and also, perhaps more understandably, from one media company to the next. The act of creating metadata is in itself an investment, so there is a reluctance to share metadata with other media companies unless it can be monetised. As content passes through the media chain, the generation of metadata can sometimes be duplicated by different media companies.

Even within a single media company, it is not unusual for some teams to use one metadata recording system then not share that system or metadata with other teams, so the work is duplicated. These high levels of duplication are not efficient for individual media businesses, nor for the industry as a whole, and the terminology used can vary from team to team.

Different content workflows have different metadata needs

If metadata is being recorded for lots of different functions such as indexing, archiving, compliance and QC, it can very quickly proliferate, even if it is being recorded with clear purpose. To get round this, metadata processes need to be made more efficient and more streamlined.

Processes must set out an efficient way to mark, track and publish technical metadata, descriptive metadata, custom metadata, customer specific metadata, and supply chain metadata. Carrying



metadata from the point of ingest, to the end product on the MAM platform, is probably the most efficient point in the media supply chain to record metadata but what's recorded needs to work for all media operators involved in content processing.

Empowering media operators to work efficiently It is important to empower media operators to use their skills, work efficiently and give the best insights to teams at later stages in the media supply chain. Ideally, a metadata system or process shouldn't allow operators to take actions that are unhelpful to the metadata process, but this is not always the case. What is important is cooperation, collaboration, and communication. AI tools can be used to assist media operators in tagging of descriptive metadata, to free up their time for more nuanced, skilled input that is required for effective metadata.

It also helps if media operator teams understand why they are tagging metadata. This helps them be more connected and engaged with the workflow, empowering teams in their day-to-day work and giving them a sense of purpose.

Metadata is indeed complex: that is the nature of the beast. Therefore, it is so important to take steps to avoid metadata fatigue. Media companies must make sure that the information collected as metadata is as useful as it can be, and is recorded in such a way to remove duplication and maximise efficiency. If media organisations can streamline this process, metadata can live up to its true potential.

LTN

The challenges and opportunities of scale in today's media industry

Today's broadcasting landscape is highly dynamic and characterized by non-stop technology innovation, increased competition across different platforms, and rapidly evolving consumer demands. Scale is one of the most pressing issues influencing these factors. New viewing platforms are emerging quicker than ever, and broadcasters need flexible, scalable distribution solutions to keep up with this rapid pace of change. It's a top priority for almost all major media companies, yet delivering it efficiently and getting the best content to viewers across numerous digital platforms without heavy and costly infrastructure is a big challenge in the current environment.



Rick Young
SVP, Head of Global
Products, LTN

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An effective combination of strong (not high) investment and robust technology solutions can give media companies precisely what they need. With this in mind, media companies across the whole chain need to make the proper steps to thrive in this unpredictable environment. The decisions they make today will significantly impact how they will perform in the constantly evolving future. Making the right ones will empower them to take advantage of new opportunities.

Maximising the yield from content

One of the major challenges for the industry is making the most of the content assets available. Faced with squeezed ad revenues and the rising cost of content, broadcasters need to maximize the yield from their live and non-live content assets and drive cost savings, while finding new audiences, wherever possible – without compromising service quality and reliability. Audiences on traditional linear platforms are in decline. Consumers have now migrated toward OTT platforms – both ad supported and subscription based, ensuring that a robust digital distribution strategy can be the key to creating outstanding content that maximizes that yield.

One way to do this is by ensuring that media companies put customization at the heart of their strategy. Today, great content needs



to be targeted to deepen platform loyalty and drive viewer engagement. As we continuously see, digital platforms replace traditional cable services as the primary viewing source for many consumers. Connecting with these audiences at a local level with tailored content can act as an essential service differentiator. Whether it is local news, sports, platform-specific or region-specific programming, it is a clear path to retain consumers. A versioning and customization strategy is achievable without breaking the bank and is a

critical strategy to get into the streaming world and grow a fragmented audience.

Looking up at the cloud

Achieving scale in the digital era is complex, and it is one of the hallmarks of the cloud. For many media organizations, it requires both a business and technology shift. Pivoting from CapEx-focused models to OpEx-favored approaches with a cloud-defined technology strategy can help companies increase scalability and business agility, allowing them to spin up services rapidly based on evolving requirements. Said another way – media companies need to experiment to find the right product mix to reach audiences wherever they are.

Boasting impressive data storage capacity, processing power, and networking, these can all be scaled through cloud computing infrastructure quickly and easily. Scalable cloud architecture is made possible through virtualization. Cloud technology solutions, done right, are highly flexible and can be easily scaled up or down. Workloads, workflows and applications can be distributed across a region or the globe as needed. This ability is perfect for media companies to meet the fluctuating market demands.

Finding the right partner to make this possible

As mentioned, the cost of investment in such technology is high, and with tighter budgets, this is where the right business strategy can save a company hundreds of thousands. This is where partnering with a company like LTN makes the most sense. Tapping into LTN's wealth of knowledge acquired over years of experience gained from building a one-of-kind global IP transmission network from the ground up and incorporating that into the capabilities and technical solutions while also understanding the business operations and configurations can help media companies navigate today's landscape.

LTN is one company at the heart of this intersection of media output. Its award-winning platform, LTN Lift, builds on the dynamic capabilities that media companies need and allows them to automate the creation of multiple



derivative versions from a primary linear channel, spinning up secondary channels and integrating live and non-live programming.

A solution like Lift allows companies to adjust programming to fit cross-platform programming requirements or provide tailored, localized content for different audiences. Media companies can provide fresh, local, and engaging content across these OTT platforms and FAST services, optimizing audience reach and monetization.

The right partner also has advantages with the cloud. Through a third party, the cloud providers have all the infrastructure already in place. Prior to hosted and cloud-based solutions like Lift and Arc, scaling with on-premises physical infrastructure would take weeks or months and require tremendous expense, often resulting in lost opportunities tied to time to market.

Media companies should also consider a partner that offers a customer-centric approach. In the constantly busy and unpredictable media world, a good partner can provide 24/7 support from a team of experts and professionals to help maintain quality and consistency – avoiding the apparent downsides of going alone.

Final thoughts

Spinning up new channels automatically and extending audience reach across digital platforms creates opportunities the industry has never seen before. Overcoming the challenges is not easy, but there is no better time for media companies to act and stay ahead of the curve. Scale is not a buzzword and will only evolve as our industry progresses, and it can be achieved more easily than initially thought. In doing so, media companies will not only expand their reach across digital platforms. They will enjoy the benefits that come with it, including capturing new eyeballs and fueling revenue generation. As we embark on this new era of storytelling, there is no better time to embrace it.

IABM members have access to a wide range of benefits



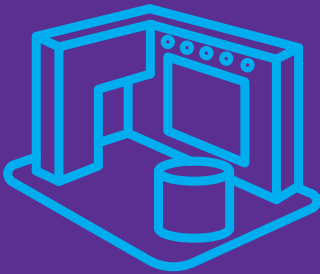
MEDIA TECH
INTELLIGENCE



KNOWLEDGE
AND INSIGHT



COLLABORATION



EVENTS &
TRADE SUPPORT



SKILLS &
EDUCATION



BRAND
ENHANCEMENT

PlayBox Technology

Balancing the challenges of streaming delivery

Broadcasters are no longer the only show in town. If a consumer wants to watch television, there are the disrupters, the digital first companies who started by offering subscription streaming services, and who are now moving into linear channels (and picking up rights to major sports) and adding advertising funding to the mix.



Phillip Neighbour
COO, PlayBox Technology

But there are other content sources, too. Sports clubs and federations are offering their own channels via streaming. Houses of worship are using video to engage with their congregations in new ways. At PlayBox we have even provided channel management technology to local government, allowing them to share council meetings and committees, along with features on their work, with the electorate.

For the consumer, these are all television channels. It does not matter if it is a national broadcaster, your church or the local college sports team: they expect it to behave like the television channels we have been watching for eight decades. That means that programmes appear to a published schedule, with no glitches or gaps, and commercials never crash the programmes.

The audience expectation is also that, as well as the scheduled linear feed, they will have access to the content at any time, through a simple to access video on demand service.

But underlying this demand and response, there are rules which remain in force. The intellectual property rights to content may be controlled, so while some can be sprayed out on the internet to anyone who clicks in the right place, others may have geographic and time limitations which have to be observed.

Through a mixture of regulation and common practice, broadcasters have also developed a set of standards. These obviously include decency and the need to restrict adult content to adult audiences. It also means more subtle things like managing advertising to avoid direct clashes – two car brands in one break – and repetition – the same spot in break after break – which just irritates the viewer.

Streaming services will at the very least want to know who is watching, so there must be some level of consumer tracking. If you are charging a subscription then you need a mechanism to collect the money, and turn feeds on and off.

All of this is well understood. The challenge is how to provide all this functionality, affordably and sustainably. Given the multiplicity of production formats, live feeds and delivery platforms, just getting the content to the audience is not trivial. Add all the other layers of CSM, asset management and VoD clients and it all gets very demanding.

For a broadcaster with established technical teams, or for a streaming service disruptor set up with software skills, this is achievable if demanding of resources. For the others – who have good content and a good reason for reaching an audience – it can be so daunting it threatens to derail the project.

Vendors have to find a way of making this happen. That means changing the way we have done things, and moving away from one device per function. Having a piece of electronics running continuously but only actually used for some of the time is just a power drain, an unnecessary addition to your carbon footprint.

It is not enough to say that automation can make all the functionality you need happen. The automation needs to be able to do all these things with the minimum of resources.

To give an example, in the past a broadcaster would localise a service – add some programming and specific commercials – by having a subset of playout facilities in the region. At PlayBox we have been very effective with a device called EdgeBox, which we



continue to offer, which sits in the local headend and performs the necessary regionalisation.

But as we move to the cloud, so this regionalisation can be streamlined. We do not need processes running 24/7 if all it is doing is inserting some commercials, and switching to a local feed for, say, the regional news bulletin. Much better to minimise processor demand by only spooling up those facilities when you actually need them.

The converse is that you can now centralise the operation of a global broadcast network, delivering similar content and presentation to multiple countries from one set of controls. The geographic diversity of large-scale cloud providers like AWS means that you still have the advantages of edge servers, but operating in a unified environment. The true situation is that we are all still in the transitional stage here. There is a great deal of talk about the cloud in our industry, but what AWS and the others are offering is

an effectively infinitely scalable set of processors and data stores. It is up to vendors in the media industry to make it work. That means integrating the functionality from customer management to asset management; from PayPal to transcoding; from app design to channel scheduling. That means packaging all that functionality into user interfaces that are clear, intuitive, and relevant to the people and the work at hand.

Finally, and this is the hard one, it means taking away the complexities of managing cloud services so that users really benefit from the claimed advantages of only paying for what you use. Maximising effectiveness while minimising the use of resources – and thereby minimising both cost and carbon footprint – is the ultimate goal.



Pebble

How reports of the death of linear TV are greatly exaggerated

Not so long ago, it was thought that linear TV was increasingly a relic of a bygone era. Viewing patterns were changing across demographics worldwide as more and more people switched towards streaming services. However, increasingly it is looking like the reports of its demise have been premature. There are a huge number of individual surveys that give an equally huge number of differing results, but the meta-trends of it all suggest a couple of things. First, the pandemic boosted streaming figures dramatically, even artificially, and second that the coming recession is making consumers rethink their choices when it comes to streaming services.



Peter Mayhead
CEO, Pebble

The result is that linear TV is not dead. In fact, if anything, it is having a bit of a renaissance.

The recently published [Ofcom Media Nations 2022](#) report created massive headlines with its report that younger adults watch 7x less broadcast TV than those aged 65+ and that viewing across all broadcast content – that is linear channels, recordings, and on-demand – had fallen by 9% compared to 2020 and 4% compared to 2019. “The long-term trend of decline in overall viewing of broadcasters’ content, seen over the past decade, has resumed,” it stated.

There is undoubtedly a demographic fissure between different cohorts, though what is unknown is whether the ‘new’ consumption behavior of the younger generation (defined here as 16-34) evolves as they in turn grow older. Lifestyle changes caused primarily by starting families and establishing their own households tend to suggest that viewing time tends to coalesce around the large living room television once more as people age, and linear TV and its offshoots are very much a part of that experience, but there are unknowns. We lived with the model of linear TV for 60 years; Netflix has been streaming video for only 15.

The UK market is arguably the most technologically sophisticated television market in the world and is nothing if not volatile. The Ofcom report was generated from surveys that concluded in December 2021, whereas newer research from consumer research platform Attest, estimates that the number of people

watching terrestrial TV is trending up by 2.6% to reach 78.6%. Not only that, but people are watching live TV for longer, with a 1.4% increase in 4-hour-plus viewing sessions.

So what is going on here and why are we so confident that linear TV is very much a part of the future? A look at Netflix is a good place to start.

2022: A Year of Transition

It has not been an easy year for the major SVOD players, with Netflix, in particular, having an [annus horribilis](#) in 2022 so far. It lost more subscribers, 970,000, in Q2 than it has at any time in its history, has laid off employees, and has had to put its foot down on password-sharing. It has also had to announce plans to launch an ad-supported AVOD service in early 2023, with the hope that that will enable it to keep growing its user base – or at least halt the decline.

In contrast, rival Disney has experienced growth. Its combined reach (which folds in Disney+, ESPN+, Hulu, and Starz) now stands at 221.1 million subscribers, just edging Netflix’s 220.7 million figure. However, not all is well there. It too finds itself having to launch an AVOD service (on 8 December) to maintain growth and reduce churn, and is raising prices at the same time. It also has to be pointed out that nearly 60 million of its subscribers are on comparatively low-cost plans in the Indian market, lowering its ARPU considerably across the company.



Elsewhere, Amazon, of course, famously does its own thing and treats video, even the astoundingly expensive *Lord of the Rings: The Rings of Power* series, as a loss leader for its retail business. And Apple TV's quality over quantity approach is finally starting to bear fruit, but these are not easy times for SVOD. The audience is fragmented as new services launch constantly and is being forced to chop and change between providers to find the content they want to watch.

The coming economic headwinds are only going to make it worse. In October last year, analysts from the NPD Group listed cost as the #4 reason amongst consumers for canceling SVOD services. By April that had [risen to #2](#). Unsurprising really that the fastest growing sector in streaming at the moment is FAST, Free-Ad Supported TV, and streaming channels that effectively replicate the linear TV experience albeit for narrower niche audiences.

Where linear TV still wins

If anything these mushrooming FAST services serve as onramps to regular linear TV consumption for Gen Z audiences unaccustomed to the concept of a scheduled TV channel. But there are other reasons why linear TV is still a draw for audiences and will remain so for some time to come.

Live events are at the top of the list. Sport in particular, but also increasingly event-driven live TV such as reality

shows that can build huge, engaged audiences during extended runs, are still the preserve of linear TV. This is where water cooler TV first started, and the audiences and the cross-cultural phenomena that can be generated as a result can be huge. It is no accident that the world's biggest brands are involved in sports sponsorship. News should not be discounted either, especially in times of crisis, and news is very much the preserve of traditional broadcast services.

Targeted advertising is another key advantage. While this technology is also powering AVOD services, the reach of linear TV remains exceptional and the connected ad-tech ecosystems of the major players across Europe, and also increasingly in the US, only serve to exacerbate this. The combination of

linear TV and targeted ad tech remains the best way to reach large, engaged audiences.

And then there is the brand of the providers themselves. Trust is an ephemeral concept when it comes to commerce, but the big public service broadcasters that have been delivering linear TV to their audiences since World War II and before are part of the fabric of their individual countries. They may not always be the first choice for day-to-day programming anymore, but for major events, they are still the button that most viewers will reach for on the remote.

The numbers are still massive

Finally, even if the numbers of linear TV viewers are weakening in the long run it needs to be remembered they are still sizeable. [Ofcom](#) estimates that the average video viewing time in the UK in 2021 was 5 hours and 16 minutes per day, of which by far the largest amount, 144 minutes (46%), was spent with live TV, with the rest divided between SVOD, time-shift, DVD and so on.

In other words, linear TV remains the single biggest platform when it comes to video. It might not be the only game in town anymore, but it has long endured competition from a variety of sources over the years, from cinema to VHS and now SVOD, and chances are it will be a key part of broadcast strategies for many more years to come.

Embrace

How can Media-oriented Business Process Management technology optimize the content preparation chain, and improve the experience for operators?

Content producers and media companies are faced with the immense challenge of producing enough premium quality content to meet ever-increasing demand and distribution complexity.

How can Media-oriented Business Process Management technology help streamline the overall content preparation chain, and improve the experience for people involved with the numerous man-in-the-middle tasks associated?



Julien Gachot
*Co-founder and CEO,
Embrace*

Historically, broadcast manufacturers built specific and powerful tools for engineers, by engineers. It has now become critical for vendors to also bring solutions to market that connect processes, systems, and people.

In this article, we'll be touching on some of the aspects that need to be considered to develop modern, advanced automation, orchestration, and collaboration solutions suitable for the content creation industry - with users in mind.

Media travelling from creation, production, ingest, transformation, packaging, distribution, through to consumption defines what we collectively name the Content Supply Chain. It is a complete process to plan, create, manage, process, and deliver content to desired channels and audiences. At present, when content consumption grows, across multiple geographies and with an increasing number of business and distribution models, numerous solutions become necessary to run your operations.

The journey can become very complex to manage, supervise, and scale. In most cases, with the same headcount.

More than with any other industry, the Media Supply Chain is a business process that uniquely includes both systems and users. Most creations require human review and approval for example. Professional tools

(storage, asset management, creative apps, collaboration platforms) are already in operation. Workflow automation appears to be more critical than ever to manage efficiently the Content Chain in a fierce competitive environment.

Defining a Content Chain strategy comes with some serious challenges for media companies of all sizes: speed to implementation, internal IT expertise and resources, ease of use for operators, simplicity to integrate with existing systems. At Embrace, we design our solutions and business models considering all these stakes. In fact, all our products meet our mission statement to help companies in their transformation efforts leveraging user-centric applications and low-code design for instant adoption by operators and engineers. We strongly believe this strengthens our customers' sovereignty by limiting the dependency on the vendor with faster implementation, instant adoption by users, higher quality of deliverables, predictable and reduced costs to maintain the system in operation and manage constant evolutions.

A user-centric approach optimizes processes and improves collaboration

Designing products based on user habits and expectations greatly improves the onboarding and adoption of innovative solutions. The user-centric



approach also greatly helps break operational silos by connecting peers in a simple, quick and safe manner – including remote users – making collaboration easier than ever. However complex the workflow, operators should not be exposed to the underlying technological complexity.

Platforms must seamlessly fit in any technical framework

The days of end-to-end solutions in Broadcast are behind us and have given way to best-of-breed and hybrid-cloud architectures. It has become imperative to combine modern IT architecture with clear and readable business models, allowing customers to easily integrate pertinent business tools, scale infinitely at predictable costs, and fully control their information systems. Amongst other things, products should always offer Open APIs, rely on standard protocols and services, and be available on premise, in the Cloud, or in hybrid mode.

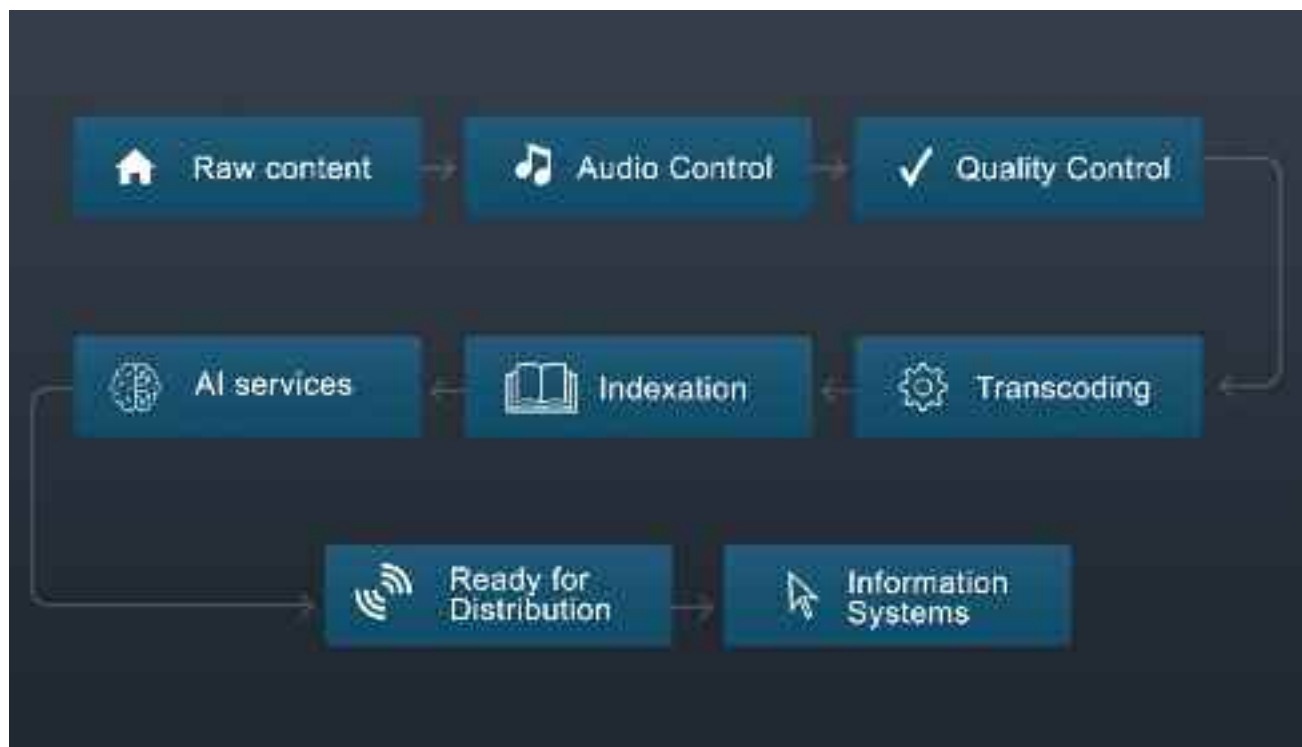
Low-code automation allows for easy implementation and personalization

Low-code is a new way to empower customers to build their own media workflows and integrations extremely fast. In fact, complex workflows are drawn instead of requiring line by line coding. All workflows or connectors

are reusable, like LEGO® bricks, and are always secure and reliable. Not only is customization made simple when designing media workflows using Low-code initially, but it also makes them extremely fast to adapt once in production. Very limited programming skills are required from the technicians or engineers in charge of maintaining the Content Chain in operation.

When we established Embrace in 2015, we initially launched an automatic promo versioning platform called Automate-IT. We believe the instant market fit came from the fact that the system uniquely satisfied both the creative teams and the engineers alike.

Just before the pandemic, we came to market with a Business Process Management system called Pulse-IT. Unlike with automatic promo versioning, we were not the first company to offer a media-oriented orchestration solution. However, by embracing some of the concepts covered in this article and then translating our vision into the product, Pulse-IT empowers our customers to translate, optimize, execute and monitor any business or broadcast processes simply and quickly. Very complex workflows can be set-up in minutes connecting modern and legacy systems and yet be extremely easy to interact with for any operator in the organization.





Pulse-IT system overview

At the core, Pulse-IT is the orchestration layer accelerating a wide variety of content creation or broadcast processes from ingesting, transcoding, transcription, metadata mining, asset management, asset utilization, automated content processing or postproduction, packaging, versioning egress to distribution. Pulse-IT excels in breaking down barriers and silos while connecting disparate heterogeneous systems to form a cohesive workflow that increases throughput and simplifies operator use.

How does Pulse-IT contribute to the Content Chain process?

Below is a typical supply chain workflow where raw material is ingested for standardization. The process includes audio quality control and processing, transcoding, metadata indexation, AI services and transfer for distribution to On-demand services, OTT, TV or Direct-to-consumer platforms.

In this case, Pulse-IT can orchestrate all steps, start workflows, and interact with users via HTML customized forms. The system is configured by

entering parameters and settings to connect on-line and archive storage, MAMs, PAMs. This gives the ability to simply adapt the orchestration of the Content Supply Chain to all types of environments to serve operational teams efficiently and limit human mistakes.

Content Supply Chain transformation brings many benefits in terms of operational efficiencies and business agility to become a competitive advantage for media companies of all sizes. Automation and optimization can significantly help improve modern media operations, unleash the creativity of talents, ease your user's journey into working with emerging technologies, such as AI and ML.

Content Supply Chain platforms help solve operational workflow pains by implementing user-centric solutions that invite customers to welcome digital transformation positively, because it enhances their own performance. Applications need to connect people and systems at all stages of the business process from Ingest to Distribution to produce large quantities of high-quality content, in different formats, for various audiences.

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Videomenthe Collaborative Workflows in the Cloud: Embracing the Future

The pandemic has massively accelerated the demand for streaming video services, with audiences spending more time at home. In France for example, the SVOD market grew by 43% in 2020 (source: CNC-GFK), and the trend is quite similar in most countries.

As a consequence, the broadcast and entertainment industry had to face a new challenge: produce more content, with fewer resources available on site, and adapt this content to an international audience.

This situation has therefore highlighted the need for tools that allow media professionals to work together, in an efficient way, to continue preparing and exchanging content with partners, quickly delivering programmes to audiences, etc

What if the collaboration in the cloud between production, post-production houses, broadcasters, etc was the essential solution to manage media content quickly and efficiently, regardless of location? Without forgetting the ecological issues, which are of prime importance today!

Digital tools but still manual loop

The days when digital tools and the cloud were seen as a scarecrow in the broadcast world are over. The fear of teams being dispossessed of their skills by the cloud seems to be fading, and the advantages and limitations of these new tools are now quite clearly established. We observe that every company is now using the cloud but as a by-product of their own solution, and not really for full collaboration.

The problem is therefore no longer really in the use of the cloud, but in the ability of the various players involved in the creation and validation of content to work together. Content exchanges for the revision and validation stages are still manual, even with the use of digital tools: multiple emails, sending via file transfer platforms, use of collaborative cloud tools for monitoring revisions (mainly office automation), etc. All these tools, as efficient as they may seem, are used without any link between them, which leads to manual steps. These steps are still complex to orchestrate,

time-consuming, a source of errors, problematic in terms of content security, etc.

The notion of a single, secure and easy-to-use cloud hub, really designed for broadcast processes, is becoming a real issue, in order to work collaboratively on content and deliver it to playout within the given timeframe.

Use case: content preparation from production to distribution

Let's take a simple use case: the preparation of multilingual content intended for broadcasting on a linear or VOD platform.

In simple terms, the process usually involves several actors, from different companies:

- the rights-holder delivers the program to the broadcaster who bought it;
- the broadcaster checks that the program meets the required technical standards and specifications, through a Quality Control step;
- the broadcaster then entrusts the program to a production house or a lab, in order to add subtitles;
- the lab calls on its translators, mostly freelancers, working remotely, each in a different part of the world, possibly in different time zones, and working at their own pace.

All these steps are mainly done on business-specific tools; content is exchanged a bunch of times through unique tools to review, comment, modify, review again, etc, until the final validation.

The lab must ensure that the project runs smoothly, that the timing is respected and that the quality of the work delivered is good, before supplying the final media to the broadcaster.

On this type of project, there are several pitfalls: how to get a global vision of the work of the freelancers? How to make actors from different companies work together, without wasting time? How to manage multiple versions of files without manual errors? How to keep the budget in check and guarantee deadlines? Finally, the question of the ecological cost of all this trade must be asked, at a time when eco-production is a real issue.

To address these pitfalls, Videomenthe delivers a fluid, collaborative workflow via a SaaS platform dedicated to the management of media workflows. The idea is to offer all the necessary tools on a unique platform, which all partners can work on, with specific user interfaces. No need to use multiple different softwares – all is provided in a secured cloud interface, answering the need and specifications of the broadcast industry (and also now the corporate one). The content provider and all the partners involved in the global workflow can monitor and view the different steps through which the content is processed.

The workflow is entirely done on the platform:

- Basically, the broadcaster uploads the file, launches a technical QC step according to its desired test-plan – a step which is managed by the technical team
- Then the file goes through an editorial check, managed this time by the editorial team
- If both technical and editorial checks are ok, the file goes to the transcription & translation steps, managed by the post-prod house / lab
- The translators have access to the file with restricted rights, according to the language they have to manage
- Once they reviewed, corrected and validated the file, the post-production house can validate or ask for additional review if needed
- Once the workflow is finished, the broadcaster can download the ready-to-broadcast content

The benefits of such a platform are many:

- A unique platform, to avoid the back and forth of content on external tools
- Simplified, secure and faster content preparation
- A reduction of the ecological footprint of these multiple exchanges (digital does not mean no ecological footprint!)
- A better ROI



Example of collaborative content preparation workflow in a broadcast environment



Example of collaborative subtitling workflow involving 4 actors (corporate market)

Conclusion

The market continues to evolve and adapt, embracing cloud technologies as an opportunity to ease the way we work, from anywhere, with anyone, whatever the language.

But today, the answer is far away from being just the cloud: multiplying the digital tools is definitely not the ultimate answer. The key is now in the way we work together on these tools, to increase efficiency, productivity and cost-effectiveness with a 'green' attitude.

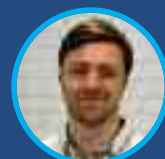
At Videomenthe, we've been working on this collaboration axis for more than six years, by offering a cloud-based collaborative media workflow platform, Eolementhe®.

Eolementhe® is true to our DNA: fluidity of workflows, ease of use and collaborative work. Our solution allows a real collaboration between the various stakeholders, capitalizing on the possibilities offered by the cloud tools.

Simplestream

Content that moves fast, live and on demand

Content is king. Even more accurately, video content sits at the throne, being the most valuable asset for broadcasters and media brands of all kinds and sizes. Made to be distributed, consumed – and most importantly – monetised, video travels fast from creator to end-user, stimulating OTT and streaming players to adopt creative and efficient operational workflows, corroborated by best-in-class solutions and tech stacks.



Ashley Horne
*Technical Director,
Simplestream*

At Simplestream, in over a decade of research and development of architectures that simplify the inner complexity of OTT, we have embarked on the most exciting journey across the cycle that takes content from live to on demand (Live2VOD, VOD), to distribution – in real time – of the same video assets through linear playout (VOD2Live). Bearing in mind the demands that the orchestration of such workflows naturally creates, Simplestream has developed a best-in-class solution to allow any stakeholder in the content space, to leverage their existing VOD content to create ‘live’ linear channels, with optional adverts and a seamless playback experience.

VOD2Live brings a number of unique differentiators to the OTT and streaming sector, among which is the possibility for operators to choose the preferred distribution model for their newly created channels: a free ad-supported television (FAST) channel, a virtual channel enriched by data-driven dynamic graphic overlays, a ‘pop-up’ channel, a barker channel for seamless loops of advertisements, and so on. Think of a Christmas-themed channel for children’s content that is solely focused on festive episodes or films at that time of the year. Pop-up channels also have a similar appeal in that they could be used periodically to showcase trending or popular content that is relevant to a specific audience.

Simplified workflows

Built on the foundation of Media Manager, Simplestream’s proprietary product for the



management and distribution of content, VOD2Live presents the operator with a simplified interface to manage the workflow. Once the content is created and the initial packaging stage is complete, VOD assets are assembled into a playlist. Channel creators can easily see the schedule and electronic programme guide for the coming days including ad breaks and playout times. The breakpoints are presented as SCTE-35 markers within the live stream for the optional insertion of advertisements. These can be placed at the start and end of the video, or throughout its duration, according to any mid-roll rules. Once assembled, the playlist is submitted to be turned into a channel, by using AWS’ solution, MediaTailor. Simplestream provides the schedule and references to the video assets, MediaTailor normalises the content and turns it into a linear stream, using channel assembly.

One solution, multiple channels

A VOD2Live-powered channel becomes a broadcast channel through the easy-to-use scheduler (controlled

via Media Manager). Channels can be built as thematic, genre-, or series-based, complete with ad slots and slates. Looped channels are created through content that's scheduled on a variable loop (1-to-24 hours), using a web-based playlist interface. Scheduled channels, instead, use XML/JSON/MRSS/Excel external playlist schedules to automatically generate playout for distribution of content.

The streaming of channels happens with an out-of-the-box Content Delivery Network (CDN) – or any other third-party. Channels are distributed through a variety of applications (web, mobile, tablet, HbbTV, Smart TV, and consoles), with Live and EPG views. VOD2Live streams are available in HLS and DASH formats, while linear EPGs are created automatically from the channel, ready to be utilised on the platforms of choice. Further opportunities to enlarge a channel's footprint are made available by 20+ syndication connectors that leverage Simplestream's Syndication module, via XML, JSON, and MRSS.

Enhanced revenue streams

Monetisation is made possible with personalised ad content – delivered via SSAI – that allows operators to seamlessly serve unique ads to each user, without limitations. No SDK is required, the module supports VAST, VPAID, and VMAP tags, setting any compatibility concerns aside with an ad server-agnostic approach. Personalised key-values and consent management platforms (CMP) are supported, out-of-the-box. Granular details are available with the device ID for Apple's Identifier for Advertising (IDFA) and



Google Advertising ID (GAID), including users' GDPR consent string, content ID and more. SSAI insertion can be completed as part of the AWS MediaTailor implementation, or the SCTE-35 markers can be passed downstream to have ads inserted by third-party providers.

Innovation at the core

Virtual channels can further be enriched by data-driven dynamic graphic overlays, a powerful way to deepen the end-user experience with additional layers of information on top of the video content. The feature is ideal for teleshopping channels, the broadcast of sporting events, as well as faith channels, pop-up themed channels, or even barker channels for seamless distribution of advertisements.

A VOD2Live channel can be deployed in under 48 hours for operators who

already own Media Manager. For new customers, onboarding must occur prior to channel deployment, with a 'go-live' timeframe of two to four weeks.

On the horizon

Among the most exciting developments on the horizon is certainly the possibility to integrate actual live event feeds alongside the on demand assets that are commonly utilised to power the 'live' linear channels. Think of a traditional broadcast channel and how that operates, yet at a fraction of the cost. Live events can be shown on a channel with additional SSAI, responding to the need for enhanced revenue generation of content owners, in the same timeframe as a traditional linear broadcast channel. With the added benefits of reduced time-to-market, and the opportunity to scale quickly across multiple target audiences.

Globecast

Maximising the cloud across the media supply chain

Using its vast experience, approximately 18 months ago, Globecast began a strategic process to explore the market and fully understand the challenges customers face across their digital transformations. In turn, this has allowed Globecast to best position itself to help both new and existing customers as they continue their journey. The result is four key strategic growth initiatives, one of which being media supply chain. So, what do we mean by media supply chain?



Sebastien Fauzan
Head of Marketing for Sports and Live, Globecast

Globecast's media supply chain strategic initiative is designed to ensure that customers get the most from their media via a one-stop shop for cloud playout including 4K live sports, pop-up channels, localisation and disaster recovery, alongside fully orchestrated VOD logistics and asset management. Central to this is the cloud.

Using the cloud

Shakunt Malhotra, MD of Globecast in Asia and the person who is heading up this media supply chain strategy initiative, says, "The cloud plays a very major role across this. Pre-Covid we were helping customers move their content into the cloud. Now, we are helping them move their broadcast workflows into the cloud. What the cloud brings is very quick time-to-market for service launches and great flexibility to add/amend those services, or to create pop-up services as and when required. This is important in helping test new markets and new content ideas quickly and cost-effectively. Alongside this sits our VOD content prep and asset management as well as IP service creation for distribution."

Malhotra explains that as internet penetration has grown, alongside mobile and tablet technologies, content processing and delivery has had to respond to those changes. "We have seen the growth in the number of platforms and the increasing importance of creating content that's relevant for each audience," says Malhotra, adding, "Of course, devices require different content formats to take advantage of their

capabilities. We manage the processing and delivery of content based on consumer needs, platform needs and device needs. The cloud is very much at the centre of our overall strategy."

As content consumers, many of us used to sign multi-year subscriptions with pay-TV operators but that model has changed and now, with the number of content providers out there, we may sign up for a month or two to a service and then move on. Or dip in and out of services as and when we want. This requires new technological models to provide the flexibility required to satisfy these demands.

Malhotra adds, "We work with customers to understand their business and their commercial plans. This may sound glib but it's crucial. We only develop services, which, as explained, we can now do far faster via the cloud, once we understand what a given customer is trying to achieve."

AWS Partner Network

Globecast announced earlier this year that it has joined the AWS Partner Network. The company extended its reach with AWS on the product side when it revealed its Globecast Managed Cloud Network (MCN) solution successfully completed AWS' Foundational Technical Review (FTR). The AWS FTR enables AWS Partners to identify and remediate risks in their products or solutions, providing specific guidelines to adopt cloud best practices designed to reduce risks around security, reliability, and operational excellence, as defined by the AWS Well-Architected Framework.



Manage and Publish



Globecast receives content and GAC Media schedules for both channels via AWS S3 peering transfer. The company's automation pairs content with the broadcast schedule for playback. Graphics such as logos and advanced branding are stored in the cloud and also controlled via the automation. Playout is in MPEG-4 HD and for GAC Living, we uplink to the SES-1 satellite. For GAC Family, the playout is sent via AWS peering and redundant fiber transport to the uplink.

Meanwhile in Asia, beIN ASIA PACIFIC has selected Globecast to provide multifaceted media processing and delivery services to the sports provider's Asia-Pacific division. beIN ASIA PACIFIC is part of beIN MEDIA GROUP and is headquartered in Singapore. It operates in 11 countries across the Asia-Pacific region – Australia, New Zealand, Cambodia, Hong Kong, Indonesia, Laos, Malaysia, Philippines, Thailand, Timor-Leste and Singapore. beIN offers a comprehensive line-up of live sporting events through its channel, beIN SPORTS and live streaming app, beIN SPORTS CONNECT. With 15 unique channel feeds, beIN offers fans extensive live sports coverage in Thai, Bahasa, Cantonese and English. beIN SPORTS is available on major pay-TV platforms in the region.

Globecast is providing a wide range of services including cloud and on-prem playout, sports contribution services and content management. The company is also supplying satellite, fibre and IP streaming distribution. Globecast will also host the sports provider's OTT platform for the region as well as providing the ability to create and distribute pop-up channels as and when required.

Malhotra concludes, "There are many companies that have the cloud at the centre of their strategy but what they simply don't have is our 30 years of experience of creating channels and managing content, from Tier 1 sports to niche channels. We know how to manage global services, localise channels and manage VOD content because we have done so for years. We have the global infrastructure and highly qualified staff to do so. And quality matters across what we do. Our engineers are trained to work in this new environment: they understand media and the traditional ways of working and now they understand the new cloud world. We are both global and local. The value proposition to our customers is far, far beyond those who simply supply the technology alongside very basic services."

Real World examples

Globecast began working with Crown Media in 2017 and late last year announced a project where together the companies designed an evolution of Crown's channels from traditional hardware-based, on-prem playout to a virtual cloud platform. The new platform supports a number of different linear services including both HD and SD for all of the Crown Media channels, as well as OTT variants of the linear product.

The five-year deal solidifies Globecast's management of the primary playout of both the linear and OTT feeds of the channels, alongside all terrestrial and satellite distribution to MVPDs and VMVPDs. Globecast is also handling the streaming of Hallmark's TV Everywhere offering to mobile devices.

The company has engineered a completely cloud-based solution in partnership with AWS. Crown Media has its content library managed in the cloud, which feeds into Globecast's media supply chain. Globecast's media management solution and automation integrates ready-to-air files to the playlist. The channels are then distributed via satellite and terrestrially from Globecast's Culver City facility. Hallmark Channels operate with a high degree of operational complexity, having considerable onscreen graphics requirements, and branding changes that occur throughout the year to highlight various holidays and other events.

Earlier this year we also announced that GAC Media, home to GAC Family and GAC Living channels, is using our cloud playout services, along with satellite distribution, to support both networks.

This partnership includes a cloud-hosted content library, video and audio monitoring facilities, terrestrial interconnect, satellite transmission, and encoding for streaming services. Both channels are being broadcast in HD and 24/7 monitoring is taking place at our Culver City location.

Signiant

Where is that file I need right now?

Where is that media file?

Where is that one asset you need right now, to give to that person waiting way over on the other side of the world, so they can do their job on time? That is the question. It's the question looming large in the minds of media people in companies large and small.



Scott Carroll
Senior Manager of
Marketing Communications,
Signiant



You may have noticed: we're living in a world of distributed production, complex interweaving workflows, scattered storage, more and more content destinations, and, as always, tight deadlines. The last thing you want your people doing is spending hours clicking through file directories in search of a media file they used a year ago. Or even a month ago. Maybe the file is on local storage. Maybe it's in the cloud. Or maybe it's with the team 3,000 miles away.

There needs to be a better way. And there is. It's called [Media Engine](#) – part of the Signiant Platform.



Forward-thinking media companies are starting to use new cloud-based workflows that can make their work easier and save them money. But time and money can only be saved if taking advantage of this new technology is seamless and painless.

In this world, two abilities become paramount: smart media management, and super-fast file transfer.

Intelligent media management is about knowing what you have, finding what you need, previewing it to make sure, and moving it to where it needs to go...without delay.

You may have heard of Signiant, and think of us as the "move large files fast people." And you'd be right. After all, we've helped over 50,000 media companies and more than a million users to move petabytes of media data every day.

These connected companies started asking us for new ways our platform could solve more of their media management challenges, and search was at the top of the list.

With the release of [Media Engine](#), the Signiant Platform (including [Media Shuttle](#), [Jet](#) and [Flight Deck](#)) just got a lot better. Media Engine is a simple yet powerful media management tool that works hand in hand with fast file transfer technology. Now you get *easy search and preview* together with *ultra-fast data transport*.

With Media Engine, you just type in a single search bar, find what you're looking for, preview it and then move it.



What Media Engine isn't: another MAM

Media Asset Manager (MAM) tools have powerfully matured. But they have limitations.

MAMs typically require you to follow their metadata schema. Expensive, time consuming and maybe *unnecessary*. Most users don't need feature-rich, overbuilt systems – nor all that extra effort.

Media Engine isn't a MAM, and doesn't try to be. Its power lies in its simplicity. No need to re-encode your content, or change your storage. It can easily access your storage, index your assets, and create preview files – because the Signiant software is already there, connected to your storage.

Easy Access

It's very easy to start your Media Engine. If you're already on the Signiant Platform, it's 'point and shoot.' Initial seats of Media Engine are included with every Signiant SaaS subscription, so it costs nothing to try.

Media Engine is very easy to use. If you already have Signiant technology, the software is already deployed at each endpoint in your storage environment, creating in effect a *virtual edge network*. All you need to do is 'turn it on'.

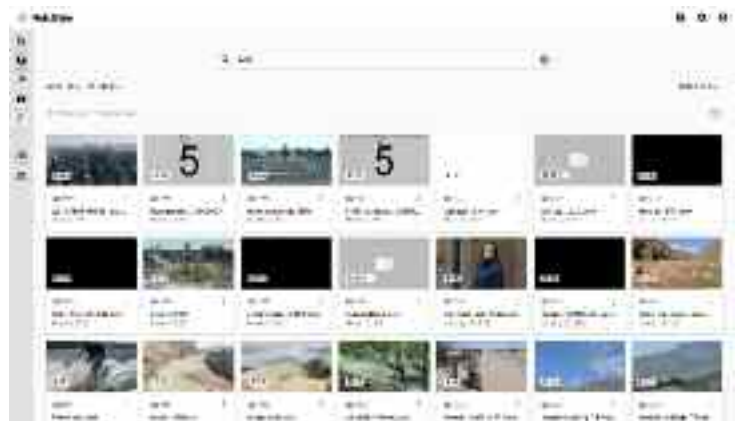
If you're not on the Signiant Platform yet, joining is easy. Signiant tools and services are cloud-native SaaS applications that are easy to deploy and use. And being SaaS means it scales to meet the needs of any size business.

How does Media Engine work?

Once activated, Media Engine indexes all your media on any Signiant-connected storage, anywhere, on-prem or in the cloud.

Once indexed, simply search and preview media. It's 'Google Search' simple. Just type in a keyword, phrase, file type, or anything else. Media Engine quickly performs a search across all your storage. Files matching your criteria pop up instantly in a simple interface. Different files, different versions. It couldn't be easier.

Preview any clip. No more guessing, or downloading unwanted media.



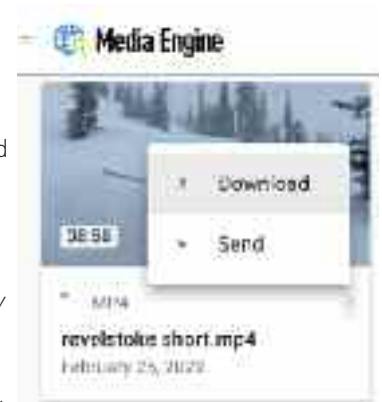
Now that you've found your asset, *take action*. Immediately. Signiant file transfer capabilities are directly integrated. Download to your desktop, or send to any location anywhere – at the speed of Signiant.

Soon you'll be able to *specify in* and out points to extract only the part of the clip you need. Ship the relevant thirty seconds, not the entire ninety-minutes.

Media Engine appears in the Signiant Platform console, into one interface. Switching between operations couldn't be simpler.

If you're not on the Signiant Platform, now may be the time.

Smart management. Fast movement. It's a powerful combination. It will *change the way you look* at your media.



About the Author

Scott Carroll, an industry veteran with a marketing and communications focus, joined Signiant to tell the stories and ongoing benefits of this company. Scott has held similar roles for other technology companies including AMD, NewTek, and Vizrt.

About Signiant

Signiant's advanced transport technology has long been trusted by the media industry for mission-critical file transfer applications across the global supply chain. The Signiant Platform provides fast, reliable, secure movement of large datasets via any IP network, with comprehensive control and visibility at any scale.

Veritone

Artificial intelligence is impacting current and future content supply chains

The pandemic completely disrupted the entire content supply chain. On-site teams had to work remotely suddenly, events were canceled, and as a result, everyone scrambled to understand how to continue business as usual in this new environment. Many adapted, using cloud tools to keep their teams connected and collaborating.



Sean King
SVP, General Manager,
Commercial Enterprise,
Veritone

But above all, it taught us that the old way of moving through content supply chains needs to be evolved to handle future disruptions and ensure we are positioned to capitalize on new revenue opportunities like the metaverse when they arise. To solve the inadequacies of today's supply chains, content creators and IP owners need to take a hard look at how they can incorporate artificial intelligence (AI) into their productions.

AI is a must-have for modern content supply chains

The past five years have made clear: AI is business-critical for organizations that want to stay relevant, agile, and healthy. [According to PwC, over 50% of companies accelerated their AI adoption plans](#) because of the COVID-19 crisis. In addition, ABI Research estimates that the media and entertainment industry will spend \$16.5 billion by 2026 on AI and machine learning (ML). [AI adoption in the broadcast world is gaining momentum as well, according to IBC.](#)

But how exactly does AI apply to the content supply chain? Looking at the nine steps or phases identified in IABM's BaM Content Chain®, AI is already playing in all areas. From a content creation perspective, synthetic voice technology, which uses AI and deep learning techniques to create voice clones, is gaining traction with voice talent and the audio world. Audio creators, from traditional radio to podcasters, brands, and TV and film producers, can start localizing content to enter new markets, opening new revenue and engagement opportunities.

With all the buzz around the metaverse, media and entertainment brands across categories have started planning or executing their content strategy for this growing space. For example, avatars, which are realistic 3D creations of individuals, are being leveraged to build digital personas for brands, influencers, celebrities, and athletes.

In this conversation, non-fungible tokens, or NFTs, also serve a purpose but don't necessarily use AI depending on the minting process and the selected blockchain. However, they are a vital content component that brands use to engage with consumers in the metaverse. AI will be foundational in supporting asset and IP management, data processing of digital interactions, and realistic audio and visual synthetic creations.

The BaM Content Chain® processes of Produce, Manage and Publish all sit within a continuum that utilizes AI, especially when considering the management and distribution of live content. In the motorsport racing world, AI is already used from a broadcaster, partner, and racing team perspective. Live content can, in near-real time, be enriched with metadata so that it's organized effectively from the outset, accelerating distribution to the media and marketing teams that need this content to drive fan engagement.



AI will uncover new opportunities otherwise left unfound

The BaM Content Chain®'s last four phases (Consume, Connect, Store, and Support) are where things get exciting. While streamlining operations provides many net benefits, every road leads to revenue. And to uncover new opportunities also means understanding what's working and where innovation is needed. But first, let's talk about the monetization piece.

The benefits of leveraging AI on the supply chain's front end directly impact how well you can monetize your content. IP owners can establish their own licensing business using AI to tag content so that it's easily discoverable by end users, from documentary filmmakers to broadcasters to fans. While this requires content to be digitized, it enables content creators to leverage their entire archives rather than the assets they are aware of today. Older brands might be sitting on content they didn't know existed. Such was the case with Veritone client, the San Francisco Giants, who were able to use our AI solution to uncover footage to celebrate baseball legend Willie Mays that had been sitting on the shelf.

Revisiting content localization, most creators start in the English market because that's the largest. But by expanding outward into other regions, you can unlock new revenue opportunities. While CPMs will vary depending on the market, these are dollars digital audio creators are leaving on the table. Looking at just the English and Spanish markets, the opportunity is more than a 100% increase in potential ad revenue if you assume several factors such as number of downloads, average CPM, number of ads served, and number of newly created episodes per month.

AI also helps with Connect and Store when you consider how AI plays into creating automated workflows and processes across tools. From the consumption perspective, leveraging AI to process vast amounts of structured and unstructured data will offer new insights into how consumers engage and consume content. These insights will inevitably inform content creators about what types of content they should create, in what formats, and on what platforms.

Lastly, AI can support not only the automation of computing all content-centric data, but it can help ensure facilities are correctly planning and optimizing how they are using energy, which will only continue to become more of a priority as consumers care more about how companies are addressing their impact on the environment.

Adopting AI doesn't have to be all at once

With AI touching the entire content supply chain, it can be overwhelming to figure out how to get started. The best place to start is one or two areas that are significant bottlenecks or pain points for you today. Once AI enters your content supply chain, you'll quickly notice other areas of the business where you can extend these capabilities, helping you scale as you need without feeling you need to make a costly investment up front.

One of the best parts of AI is that you do not need to necessarily rip and replace your existing technology stack but instead can add pieces to fill gaps or ingest AI into your current ecosystem. As a result, the technology lends itself to the flexibility of the business's needs at any given time, helping companies adopt faster and make those incremental changes over time to harden operations for a future that's already knocking at the front door.

Zixi

What things may come – the impact of 5G

After several years of false starts owing largely to the global impact of the pandemic, 2022 is set to be the year where the 5G ecosystem really starts to take off. The consumer side is now essentially a given – Apple's new 2022 iPhone SE, for instance, is among the 2022 units offering 5G connectivity in the sub \$500 bracket – and, as the year rolls on, we will start to see a significant increase in contribution and remote live production use cases. 5G enabled media workflows will not be confined to outlier events either, but will reach across the entertainment landscape.



Eric Bolten
*VP Business
Development, Zixi*

From content to consumer

5G is set to have an accelerating effect on every area of the media supply chain, from the generation of content all the way through to the delivery to the consumer where the increase in bandwidth at the point of consumption can enable new immersive video experiences.

The cumulative impact is going to be immense, as each component of the media supply chain is accelerated.

There will be greater amounts of content at a higher quality, flowing faster bi-directionally – not just to the consumer, but back to and/or between organizations as well. There is an enormous democratization of high-quality content creation underway. Tools and techniques that were once the domain of high-end industry specific equipment have been first usurped by IP-based technologies and then the cloud, effectively putting them into the hands of everyone. Porting all this to 5G removes the last technical barrier, and with increasing adoption of cloud 'as-a-Service' business models, more people have access to broadcast grade technology than ever before.

5G is an enabler for cloud adoption, and cloud broadcast infrastructure allows media

companies and service providers to quickly leverage SaaS solutions to ingest and distribute live video over IP. This delivers premium quality with ultra-low latency and the flexibility and scale to add new models for engaging audiences.

As part of the whole process of rolling out 5G, global carriers are looking to enhance value for their customers by switching to Multi-Access Edge Computing (MEC). It uses cellular networks based around 5G for its primary connectivity, which is far more efficient in delivering a massive increase in the number of connected devices and systems that can be supported as opposed to via a traditional cloud architecture. MEC helps lower latency and increase throughput, and, as such, provides further acceleration to broadcasters' plans.

This will be boosted by the ramping up of the cellular rollout. For specific use cases in the sports and events arena, leading venues have already overseen their own successful 5G deployments and the number of urban deployments is rising all the time. The confident expectation is that the 5G cellular infrastructure will start to grow exponentially as 5G's implications for users are realized and adopted.



It's important to remember that the drivers for that growth are legion, from our own broadcast industry use cases to Industry 4.0, infrastructure deployments and the full realization of the promise of the Internet of Things. For the last link in the media supply chain, the consumer, 5G will have profound consequences. Media will become ubiquitous, environments will become more immersive and bandwidth will scale to previously unimagined speeds while at the same time latency will fall through the floor.

To be honest, as an industry we have yet to scratch the surface of how all this will change technology, application, and how consumers interact with media but the smart money is on disruptive wearable devices emerging that basically immerse the consumer in an always-on 5G ecosystem and provide new classes of functionality.

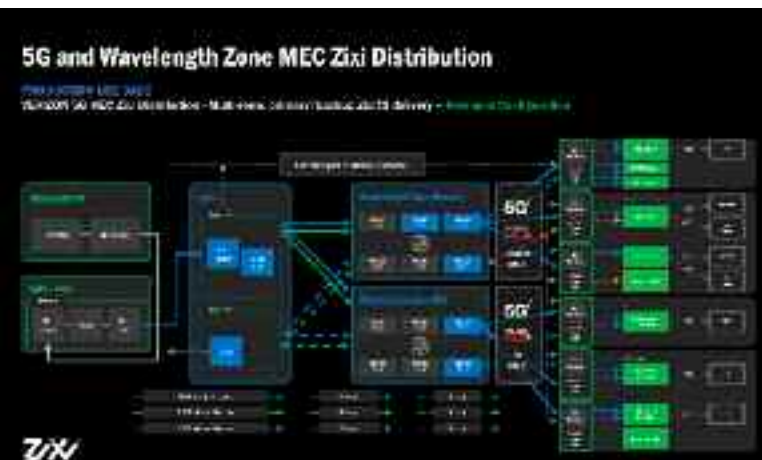
Making it all work

Under the hood, one area that is likely to see rapid innovation is monetization. Nothing about 5G is coming cheap and organizations will look to monetize their offerings and add value at multiple intersections all along the supply chain to achieve ROI. These don't have to be large transactions – because of the speed with which the networks will work a myriad of small-scale interactions can be put in place. For example, teams could sell an AR selfie taken with a driver in the cockpit of a F1 car, or clubs offer in stadia real-time bets on whether a penalty will be scored to the fans in the crowd. Gamification is going to be one of the key concepts here, as media companies look to make video relevant to a generation brought up on instant interactions and gratification via mobile devices.

It's worth pointing out that the amount of data this will all generate is orders of magnitude above what we have seen before. As a result, we will see some serious investment made in Artificial Intelligence (AI) and Machine Learning (ML) deployments that will examine the volume of data and extrapolate patterns from it. The net result, intriguingly, might be to offer consumers experiences that they didn't even know they wanted or that the industry had never even considered. Data analysis has become increasingly vital to all businesses in recent years, and as developments in AI and ML also accelerate during 2022, it is going to become absolutely mission critical.

The legal framework that supports all this is going to be interesting to monitor. Privacy legislation such as Europe's GDPR is spreading worldwide, and how the data exchanges that will form the mesh in which 5G-enabled devices sit are both policed and regulated is going to be one of the main challenges of establishing 5G ecosystems.

Add it all together and you have a fascinating mix. The opportunities of 5G are immense, but some of the use cases that will serve as its killer apps are still unknown, and there are definite challenges to its rollout both in terms of investment and in terms of regulation. In many respects, it is similar to the very early days of the internet when everything was very much in play from a technical and a business point of view. But unlike that era, which took several years to reach what you could term a mass-market proposition, the 5G one will deploy in the full glare of worldwide expectation from day one. It's going to be a fascinating few years...



Bitcentral

How to future-proof your business with a hybrid approach to monetization

Our industry's evolution over the past few years has fundamentally changed how video is consumed and monetized. Viewers expect broadcast-grade video whenever and wherever they want. Meanwhile, publishers must diversify their revenue streams to thrive in an increasingly competitive marketplace. Subscriber revenues alone are no longer enough.



Greg Morrow
*General Manager,
SMG*

Aside from Apple, all the major streaming providers in the U.S. are turning to some form of advertising, such as AVOD or free ad-supported TV (FAST) linear channels. In this fast-changing landscape, there is a clear need for new and innovative technologies to help providers progress and prosper.

Across the entire media chain, video providers must ensure that they are re-strategizing their business models to cater to the growing diversification of audiences. They must have the proper technological infrastructure to support multiple video and monetization workflows.

But, to provide a premium quality video experience across the plethora of devices and support multiple monetization processes is highly complex. Streaming providers must assemble a broad technology stack of solutions to reach their full audience engagement and monetization potential. SVOD requires one workflow, AVOD requires another, FAST linear channels require another, and the many potential syndication partners require more still.

As consumer demand for, and consumption of, video content across multiple platforms grows, more headaches are created for providers on top of their broadening monetization strategies.

Overcoming today's challenges

Bitcentral is an award-winning innovator in delivering streaming tools to help content owners excite audiences. Our combined FUEL + Powr.tv solution features turn-key premium OTT application deployment, dynamic playlisting for VOD, live and linear content, and support for advertising (AVOD), subscription (SVOD), and transactional (TVOD) business models.

Rather than having to stitch together lots of technologies from different vendors, Bitcentral provides broadcasters with a one-stop shop of pre-integrated and tested technologies. This provides them with a "Swiss army knife" of tools that equips them for all the distribution and monetization methods that are available today.

Through the FUEL + Powr.tv solution, operators can also create and syndicate



FAST linear channels to content aggregators with the same content and workflow. This significantly streamlines the complexity of distribution specifications and requirements. Content owners can create best-of-breed Connected TV (CTV), mobile, and web app solutions and make them available across major app stores, including Apple and Google, to increase audience reach and monetization through advertising.

FUEL + Powr.tv's dynamic handling of video also has the benefit of creating short clips and teaser videos for social media platforms to generate buzz for content. While not considered a revenue generator in its own right, social media has the power to build and nurture thriving content communities.

How to thrive in today's new era of storytelling

With innovative new technologies in place, there is every reason for broadcasters to be optimistic. The industry has been crying out for efficient ways of providing multi-distribution strategies for video, and the

pandemic has only accelerated this demand. Bitcentral has been at the forefront of the evolution of the media landscape for over two decades now and is ready to support broadcasters through the latest shift in the paradigm. With a focus on product development, often in partnership with customers, the company has worked tirelessly to ensure broadcasters have the most efficient media workflow solutions available and are prepared for the future.

With FUEL + Powr.tv, media companies can unlock the significant revenue opportunities available today and in the future, while ensuring audiences enjoy broadcast-grade television when and where they want to watch. And now they have more flexibility than ever in how they pay for content. With the right technology in place, broadcasters are able to maximize their return on investment in content and ensure they remain doing so in the future. There is a fantastic opportunity to seize new audience engagement opportunities and build successful monetization strategies for the long term.



Tedial

Build a strong cybersecurity framework with Tedial's NoCode Media Integration Platform smartWork

The shift to IP has opened a whole new world of possibilities to the media industry. Broadcasters and content owners can quickly and easily manage, archive and distribute content at the touch of a button from any device, at any location. Stored digitally, on-prems or in the cloud, media can be made available at a moment's notice, now or years in the future, regardless of new formats and technological advancements.



**Julián
Fernández-Campón**
CTO, Tedial

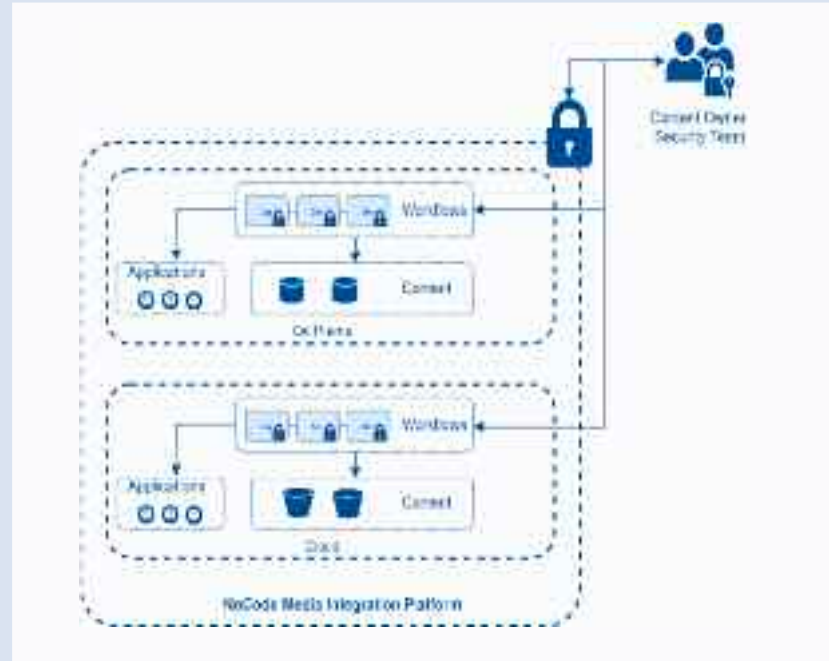
This is clearly excellent news for the industry and cause for celebration; there's just one fairly major consideration that media providers and studios need to make to ensure their digital world doesn't come pixelating down, and that's cybersecurity.

Attacks vary in nature – some look for ransom, others destroy information, some steal and sell user information and some simply cause mass disruption – the list quite literally goes on, but whatever (and whoever) is behind the attack, your business certainly doesn't want to be a victim of it.

While ransomware attacks have been around for many years, there is evidence that organized cybercrime entities are investing heavily as the number of attacks and the sophistication is growing exponentially. Garmin was hacked in July 2020. At the time, the Cyber Security Hub website explained that, "Hackers deployed the ransomware tool WastedLocker, which encrypts key data on a company's digital infrastructure. In the case of Garmin, website functions, customer support, and user applications were all affected. Unlike typical ransomware software, WastedLocker does not steal identifying information and hold it for ransom. Instead, it renders programs useless until decrypted. The hacking organization then demands a fee for the decryption key."

Companies from the M&E industry have also been affected by cybersecurity attacks. In October last year, Sinclair Broadcast was hit with a ransomware attack. A TV Technology report explains that, "On Oct. 17, certain servers and workstations were encrypted with ransomware, disrupting certain office and operational networks." And just a few months ago, in early January 2022, Portuguese terrestrial television station SIC, owned by media conglomerate Impresa, was also hit by an attack.

No organisation, media or otherwise, ever wants to be in this position. So how do companies ensure that their systems are always protected? In April, Tedial announced a new media concept and a new era in media management, with a new paradigm: smartWork, the company's NoCode Media Integration Platform or NoCode iPaaS for media. As well as providing an ecosystem of applications and media systems out-of-the-box, the Media Integration Platform offers a cybersecurity framework that protects at all levels, from the standard IT infrastructure up to the applications, and more importantly at the media production level.



smartWork democratizes business processes, empowering users to define integrations autonomously – without vendor participation – and create workflows in a flexible and agile manner. Aligned with Movielabs' 2030 Vision for Media Creation, the platform removes time-consuming and complex configurations via a common User Interface that guarantees an optimal experience and easy access to all applications, external systems (including any legacy MAMs, PAMs and DAMs ensuring business continuity), and features self-validation. An easy-to-use toolset allows users to concentrate on creativity and make the data-driven decisions necessary to quickly adapt to market or supply changes.

The IT Infrastructure and all the applications need to be secured but seen as a whole and defined, controlled and managed at the production level, and not the individual elements. This high-level security management has a reflection and some actions on the different subsystems: network, storage, services, applications, etc., but needs to be abstracted and seen from this angle and not from the IT infrastructure. This can be seen as a "Workflows Defined Security" which focuses on the operation, the content and not where the workflows are physically executed.

This is a new paradigm, which defines a platform where all the applications are integrated. Media management capabilities and workflows are defined with a NoCode approach, which allows non-technical people to implement the content supply chain processes and production workflows by themselves, without the support of the IT team nor programmers, including all the security needed.

The NoCode Media Integration Platform has some key important benefits in terms of security that makes it suitable to implement advanced security schemas to meet the most demanding customer needs:

- **Common Interface.** The common interface is one of the pillars of the platform as it offers the same methods for the same operations, but also protects the applications from external access offering a single layer to be secured, instead of securing each individual system. These systems can be isolated and protected to prevent attacks.
- **Media Abstraction Location.** The physical location of the media is not known, it's leaving in a protected storage location and it's given a one-time access.
- **Infrastructure as Code.** The deployment is adapted to each infrastructure, defined as deployment scripts using tools like Terraform that includes the use of the specific security mechanisms adapted for each target (Kubernetes cluster on prem line OKD, AWS, Google, Azure, etc.).
- **Zero Trust Approach.** Some of the points are achieved naturally by the platform:
 - Business Segmentation, Segregation of Duties is provided by the abstraction of the methods provided by the common interface and the workflow defined security that will be explained in the next section.
 - One time access, the media location abstraction layer will give access on demand to the specific content as the physical location is abstracted



And others that need to be implemented in the NoCode Media Integration Platform as part of the secure design:

- **Least Privilege access.** Defining the proper security principles such as Access Control Lists, Roles and User Groups where the access to any resource is denied by default, unless explicitly granted.
- **Multi Factor Authentication.** Integrating IAM (Identity and Access Management) systems that integrate with tools like Google Authentication, Microsoft Authenticator or more proprietary and/or device dependent tools.

- **Logging, Auditing.** Registering all the activity in the platform, including anomaly detection, notifications and any other mechanisms to have visibility of all the events, access to the media, applications and services and any other tasks done by the users or any external application.

Choosing the proper security policies and systems is a real need, but workflows in the M&E industry have several implications regarding media management. Systems integrations require a different, global, more workflow oriented approach instead of the IT approach, which is focused on infrastructure. In a NoCode Media Integration Platform security can be derived naturally to implement Zero Trust policies.

Come and see Tedral's unique NoCode Media Integration Platform smartWork in action at IBC 2022 ON STAND 10.D30.



Remote monitoring also enables more efficient operations. Technical and support teams can monitor or record different individual channels in other areas without logging in to multiple different systems.

Digital Nirvana

The Latest in Remote Broadcast Monitoring

Today, broadcasters and multichannel video programming distributors (MVPDs) prefer to manage their video from centralized operations covering a large geographic area. However, labor shortages and the dynamic growth in video services have paved the way for remote monitoring to emerge as an essential and profitable option. Over the past few years, remote monitoring has grown considerably important, with corroding profit margins and ambitious business goals having prompted broadcasters to choose this tool to improve their operations.



Jim Daves
*Senior Sales Director for
Digital Nirvana*

When an alert arose, the technician responding to the system notification would have to log in to a particular location and pull up the video from the cable TV box, rewinding to the problem from last night or two to three days ago – much like they would on a video tape – and checking the specifications. This crude process required a lot of time and labor on the part of the support team, who would still need to find where the problem occurred in the overall distribution network and fix it at its source.

Thankfully, the process of monitoring video signals has matured greatly. Through remote monitoring, any person, no matter where they are, can monitor any location at any time. Cable operators and other video distributors can monitor hundreds of locations across a large geographic area to verify ad insertion, signal quality, service delivery, and proper programming placement at the local level – all from one or more locations in the country.

This holds several benefits for both operators and engineers. For one, remote monitoring requires fewer physical trips to transmitters, headend or hub sites to correct technical problems. Remote monitoring systems can be programmed to show the location of any problematic hub, bringing up schematics that show how the network is used in the design, and thus making a workaround plan easier. In doing so, the system allows technical and support teams to provide service and monitor high-profile events live from a central location without being on-site, eliminating unnecessary truck rolls.

Remote monitoring also enables more efficient operations. Technical and support teams can monitor or record different individual channels in other areas without logging in to multiple different systems. Engineers can schedule recordings quickly through the electronic program guide in just a few simple steps. Technicians can schedule these recordings on different channels and in other zones instantly and simultaneously instead of visiting each channel individually to set up a recording. For example, it's possible to record, say, Bloomberg Television at 2 p.m. in a few locations on the West Coast and a few more in the Midwest and East Coast – all with one click.

On the broadcasters' end, remote monitoring can ensure compliance with government regulations and fulfillment of contracts with advertisers and content providers. Not only can broadcasters monitor channels to check for the placement, quality, and location of content and ads, but they can also keep a recording as proof of fulfillment. Being able to show where a problem occurred in the system can also demonstrate accountability and improve relations between the contractual parties.

Speaking of the technology itself, companies have developed remote monitoring units that contain simplified hardware and software aimed only at the remote-monitoring use case. This allows technicians to see the entire channel lineup; change channels; and view, fast forward, rewind, and scroll through live or recorded content using a remote control – all by region, ad zone, or even down to specific transmitters,

Remote Broadcast Monitoring



headends or hub sites. Essentially, the technician can surf through the channels like any other viewer, with the option to change the inputs and volume on the fly.

Having all this information at their fingertips is extremely important for technicians and broadcasters as it gives them a clear picture of maintenance needs during critical events. For instance, the volume of a commercial might play louder than what the Federal Communications Commission (FCC) regulates. If the commercial does air, and the FCC reaches out, then a recording of the channel can show them where in the distribution the rise in volume occurred, helping demonstrate accountability. Thanks to the remote monitoring system, broadcasters can also avoid or account for other critical events — like the signal going dark, the signal dropping off quality, the stream going black, or the audio disappearing.

Overall, remote monitoring is cost-effective, making it affordable for the broadcasters and MVPD's to deploy hundreds of units to locations throughout their network with the same high scalability and security. These systems are designed for remote monitoring, taking away the things people don't need and simplifying the user interface to make it extremely easy to do the job with as few clicks as possible.



Bio

Jim Daves is the senior sales director for Digital Nirvana. He oversees sales to the MVPD and broadcast TV markets. Daves has been in the business for more than 35 years. His sales expertise spans numerous hardware and software product lines associated with video and high-speed data services, interactive television, voice, OTT, IPTV, and wireless solutions. Daves is based in Atlanta.

Limecraft

A Workspace for Video Teams – the New Normal

“The concept of a digital workspace has been around for a while, but the public perception of what it is supposed to do has recently changed.”

Maarten Verwaest, CEO and Founder, Limecraft



Today, the development of creative economies and the relative importance of the Media and Entertainment industry accelerates at an unseen pace. A great example is video production – digitization not only sped up the editing process but also allows creators to express themselves in ways that were not available before. The amounts of video that video teams need to process take on unmanageable proportions. It is assumed that Artificial Intelligence comes to the rescue, but there is a catch.

The media and entertainment industries are increasingly being dominated by few vertically integrated players. These have the firepower to internally develop software to automate production processes on a vast scale. Independent producers don't have access to the technology that would allow them to compete and to access a global market, unless they engage with one of said large players, whereby they typically lose the majority or all of the exploitation rights. This massive consolidation

may lead to standardised and easy to digest audiovisual products, whereby local markets are at stake.

In the near future, we will start seeing independent digital 'workspaces'. At the core of these, seamlessly integrated AI services optimised for professional production of audiovisual material will allow producers to significantly improve their productivity. It will allow (co-)producers and service providers to interact without intervention of 3rd parties, effectively creating a dynamic ecosystem of independent operators that can be easily scaled and customised according to the specific requirements of the production. It will give birth to an approach which much more resilient to change compared to vast, vertically integrated business models. To make this happen, the supply side has to overcome a number of hurdles. First, the majority of commercially available AI services deliver hugely inaccurate or otherwise unusable results. Secondly, professionals are faced

with an explosion of point solutions and find themselves excessively copying and pasting information from one application into another. To make sure material can be more easily processed and exchanged across the organisation, the new Digital Workspace must crack these challenges.

The Limecraft Workspace for Video Teams and its key features

Limecraft offers a secure online workspaces for global video teams. A safe repository for all their content, regardless of the format (fiction, docu, news). It hides all technical complexity by sorting file format conversions and giving access to built-in AI services for Automatic Speech Recognition (ASR), translation, and image recognition. These perform the grunt work of indexing video and audio, so the users can focus on the creative processes of storytelling and video editing.

In order to make this work, we had to bring AI to another level. Unlike



text, video is not self-descriptive. AI has a lot of potential, the raw output of the individual services has to be seriously post-processed to provide an accurate and coherent description of each shot ('shot list'). This is essential for journalists and researchers, so as to allow them to find the right fragments in minutes. This is of critical importance to documentary makers, who typically work on a very large collection of data, or for journalists that need to publish their content with the shortest possible turn-around time. This is exactly why the [Associated Press](#) teamed up with Limecraft.

The most common issues that video teams run into these days

As both the demand and the offering of available video are exploding, producers are struggling for originality. The methods for producing and distributing content are being improved as we speak due to recent advances in AI for the purpose of automation. However, automation implies change and resistance to change. But we are beyond the point of no return. Producers either must adapt or die, and there will be casualties.

Besides this, as loudly conveyed during the DPP leader's briefing in November last year in Berlin, there is a large-scale war for talent going on. For that reason, and in combination with the struggle for originality, producers seek technology to improve the job of creative professionals, rather than to make them redundant. This is exactly why Limecraft came up with the concept of 'workspace' and why we made significant investments in improving AI, not to automate work as such, but as value-added tools embedded in a user-friendly application for professionals so they can do a better job.

The future

Limecraft will be one of those companies that stood up and walked through the storm. We have been offering solutions for remote editing and collaboration for 10 years; until a few years ago we had a hard time competing with traditional software businesses. Recent events have made it clear to the producer community that online collaboration is not a nice-to-have or an add-on; it has become the new normal.

The next challenge on the horizon is the technology swarm. Recently, we have seen several smaller companies come to life, solving point solutions or parts of the problem. Producers are faced with huge security-related and operational challenges.

The mean time between failure of a patchwork of point solutions is not good, as each individual component may cause downtime of the overall solution. Also from a security perspective the best of breed situation may not be optimal. Finally, from an environmental sustainability point of view, it is just nonsense to create and transfer copies of video material, often several gigabytes per hour of footage, back and forth between all these point solutions.

Therefore, producers should look for a competent partner and a workspace optimised for integration - highly optimized to minimize the number of copies and to reduce the number of file transfers. It is an approach where maximum security, environmental sustainability, and economics go hand in hand.

Consult Red

Adopting RDK throughout the connected home

RDK's strength and versatility opens up the smart home – a single software platform for managing connected device ecosystems is proving irresistible

Having started out as a Set-Top Box (STB) solution over 10 years ago, open-source software platform RDK (Reference Design Kit) has rapidly taken on a life of its own. It's a major player that is proven to seriously accelerate the development of the smart home, yet outside of the media industry, many may not have heard of it. All that might be about to change, says Rahul Mehra, CTO at leading RDK development experts, Consult Red.



Rahul Mehra
CTO,
Consult Red

RDK is evolving as a super versatile platform at the forefront of innovative consumer electronics products for broadband and video service providers. The technology has attracted a community of major players using RDK to power their broadband routers. Far from standard-issue products, these are market-leading devices used by Liberty Global, Deutsche Telekom, Sky, Comcast, and others, making RDK one of the leading open-source software platforms shipped worldwide.

RDK showing real potential as a whole home IoT solution

Operators have now deployed smart cameras in homes based on RDK (including RDK-C for camera applications), together with a smart doorbell also based on RDK. Unlike other IoT technologies, RDK is unique in that it embraces the whole home and is doing so in proven applications from the set-top box to routers to video doorbells.

RDK is now a smart TV solution too

RDK standardizes core technical functions of video devices, and RDK is an important component of Comcast's global technology platform, which powers Sky Glass and XClass TVs. Once again, these are not entry-level products but some of the smartest of smart TVs on the market.

The app framework to make the look and feel unified and seamless, specifications designed to support the nuances of a 2022 connected TV experience (such as presence detection), and the capability to support a 4K Smart Camera with motion and gesture support, are all delivered over IP.

RDK powers more than 80 million devices deployed by over 500 service providers around the world that require flexibility and control over their customer-premise equipment software and diagnostics data.

Adopters of RDK understand the potential of RDK

RDK is currently deployed across dozens of leading service providers throughout Europe, North America, Latin America, and Asia. Service providers with public RDK deployments include: Atlantic Broadband, BCN, Claro, Comcast, Cox, Deutsche Telekom, J:COM, KabelPlus, Liberty Global, Mediacom, Megacable Melita, NOS, Rogers, SFR (part of Altice Europe), Shaw, Sky, Stofa, Telcom Argentina, Toya, Vectra, Vidéotron, Vodafone, VOO, VTR, WOW, Ziggo, and others. They understand the burgeoning potential of RDK to unlock commercial opportunities across a broader range of devices outside of the traditional domain of the set-top box.

More signals that RDK has a bright future

There are strong signals RDK is being driven even further as a whole home solution. But why?

Operators want to sell different services, and some have set their sights on being firmly at the centre of the smart home. To do that they need a whole home technology, and we are seeing them embrace, extend and invest in RDK.

Recently we've seen more investment in RDK with the addition of a Zigbee radio and future support for the Matter IoT standard (for example, in the latest iteration of the Comcast router). Zigbee, Bluetooth or Wi-Fi radios typically act as the backbone of many smart home solutions. Matter is the emerging IoT standard backed by



industry giants. Together these will allow RDK and operators to get deeper into the smart home with applications such as smart heating, security, plugs, locks and home automation. So, is it yet another indicator that RDK is gearing up for a wider smart home solution, with the smart router being at the centre as a coordinating device?

OTT and content providers see the potential of RDK too. It's not just operators seeing the benefits of this approach. Recently, Netflix announced its DaVinci scaling program which allows operators to reduce the effort of integration and time-to-market to launch Netflix services on its RDK devices. The program will improve a service provider's ability to offer more enhanced viewing options and make Netflix more accessible to subscribers.

Meanwhile, other leading premium content apps also run atop RDK to give operators an accelerated on-ramp to deploying services their customers can't live without.

Just as importantly, RDK is giving operators greater versatility outside of the domain of Google TV/Android.

Silicon gets in on the RDK act

The ecosystem is growing in all directions. From a time when only one semiconductor manufacturer supported RDK (Broadcom), now Realtek, Amlogic and others are

competing to make chipsets for RDK while the number of OEMs backing the solution strengthens every day.

It's clear – there is a serious player in town. RDK is set to snowball. With versatility by design, the platform's potential is barely tapped, but it is already clear that operators value the advantage of a single software DNA for managing the burgeoning connected device ecosystem.

Thinking about RDK? Bring in the experts

Consult Red is embedded in the RDK community. We know the silicon vendors and understand the ecosystem inside and out. We help operators to achieve their goal quickly while leveraging all the smarts of the RDK playbox from PoC to prototype to product.

- An early adopter of RDK – 10+ years of experience
- One of Europe's largest RDK development teams
- Expertise in RDK from the ground up
- Proven track record working with leading operators including Sky, Comcast and Liberty Global
- Developed the world's first RDK Video Accelerator on Amlogic SoC
- Established contributor to the RDK community:
- We sit on Special Interest Groups (SIGs) and have led contributions to the Containerisation SIG

Cirkus allows Able staffers and freelancers to effectively communicate, share resources and securely share media and deliverable files

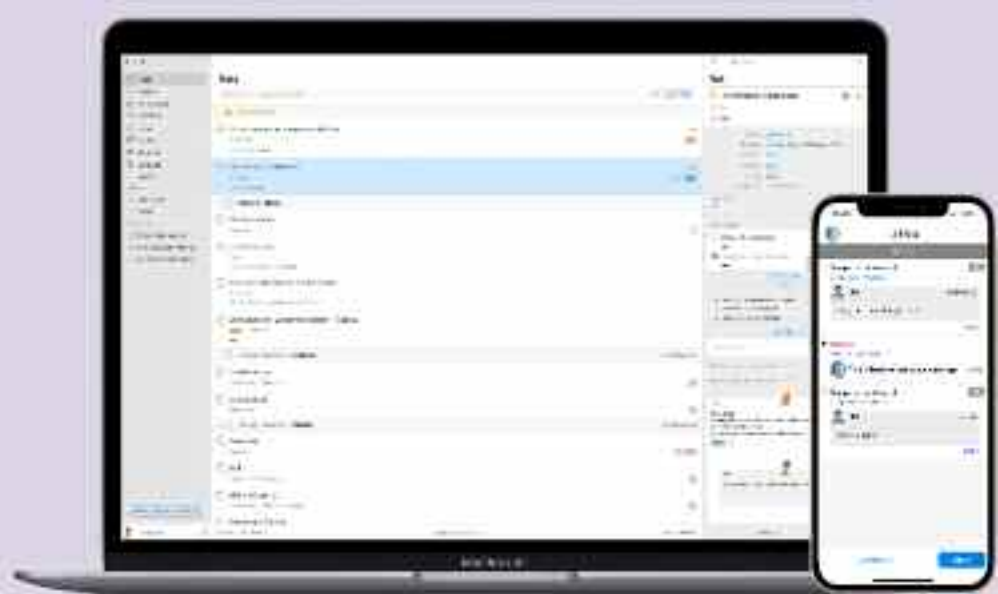
farmerswife

Cirkus automates workflows and improves collaboration for Able

Able is New Zealand's leading provider of media access services, including captioning, subtitling and audio description for broadcast TV and On Demand streaming services. Gencom has supported Able since their inception as a not-for-profit charitable trust in 2013, and today oversees all of Able's IT infrastructure and support requirements. As the organisation has grown, they wanted to automate their freelance workflow, moving away from a system that relied on manual management oversight, to a more efficient and automated process that would reduce the amount of resource required.

Gencom worked closely with Able to understand their requirements and assess the available options. Due to the organisation's unique requirements, Gencom ultimately developed a system architecture centred on Cirkus, a new collaboration toolset from farmerswife, the leading provider of resource scheduling, project management & team collaboration software for the demanding needs of today's media industry.

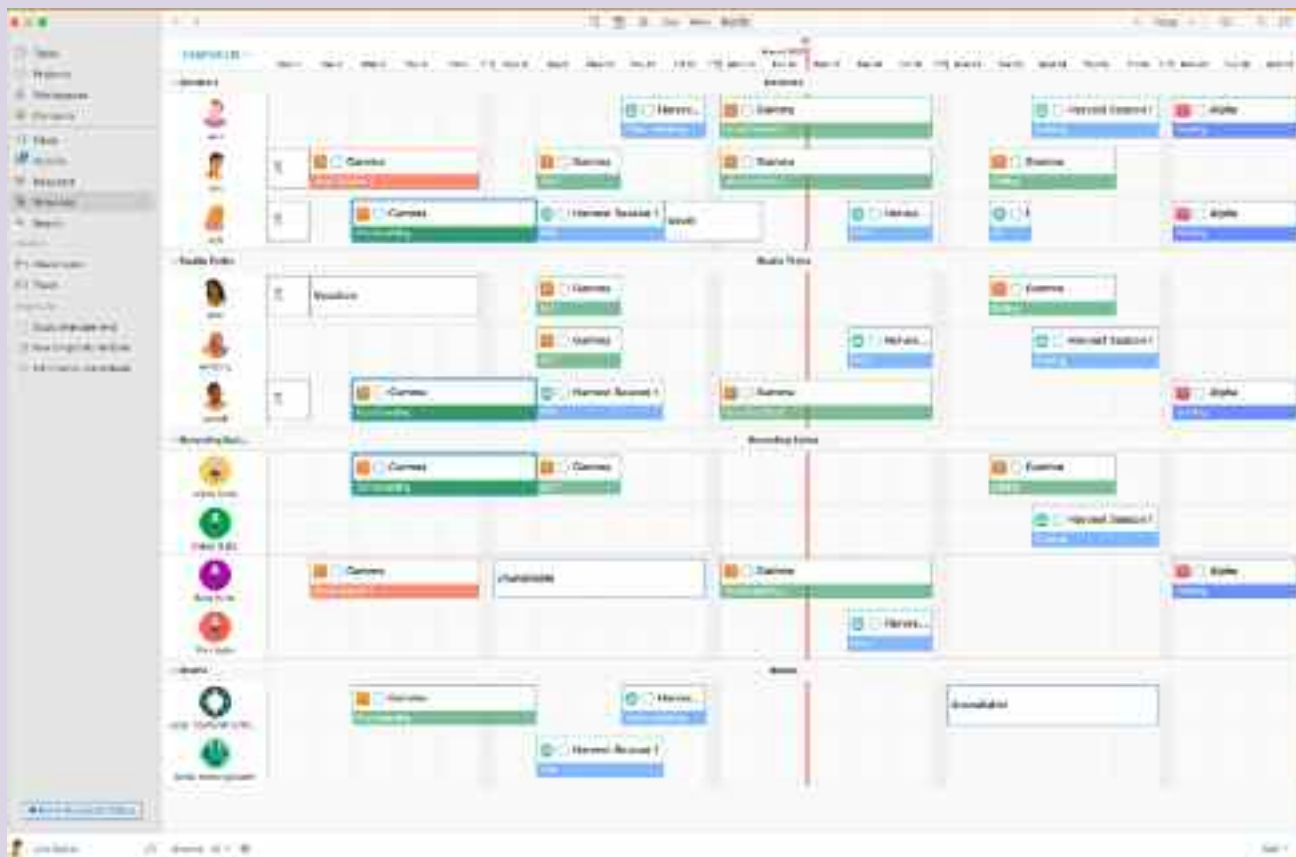
Cirkus is an easy-to-use, day-to-day task collaboration tool for teams. It allows users to unlimitedly schedule, assign and manage projects and tasks; track status and report time; and collaborate efficiently anywhere, with anyone, by coordinating resources and sharing files in one central hub. Cirkus allows Able staffers and freelancers to effectively communicate, share resources and securely share media and deliverable files. The system allows for an efficient workflow, where tasks can either be assigned to a specific freelancer aligning with their subject matter expertise or



presented to the pool of available freelancers. Data is shared securely through an intuitive web-based UI or an iOS app, which notifies the supervisors upon the completion of tasks, and allows for dialogue between freelancer and supervisor within the app.

According to Stephanie Turner, Operations Manager at Able, "The team at farmerswife were a dream to work with while we implemented

Cirkus. They were very responsive to any queries we had, and any changes we needed were actioned quickly. We find Cirkus to be a very malleable product. We were impressed by how user-friendly it was from the outset – filtering, searching, display options are all available. Whenever we had a question like 'How can we do this?' Or 'How can we see this information?', there was always a



way. Cirkus has improved and simplified our internal processes and made us an easy and efficient organisation to work with.”

Pippa, a freelancer at Able, added, “Cirkus is easy to navigate and intuitive. It is straightforward to see what tasks are upcoming – especially those that are designated urgent – and to download and upload files.”

As a part of the project, Gencom also developed a web-based application that can ingest new tasks from Able’s normal workflows. The titles available to freelancers are automatically uploaded to Cirkus with all necessary program information. The web tool also generates a set of billing reports that Able staff can provide to freelancers to make invoicing simple and error-free.

David Barnard, Managing Director for Gencom, said that “Cirkus’ open REST API made integrating the product into Able’s workflow very straightforward. Our

application allows an Able user to have full control over the tasks being ingested, including making manual changes if needed. We then use the API to create tasks in Cirkus, with full control over all aspects of each task. We’re then able to retrieve changes and task status, filtering as needed to give us the information Able needs to see in their reports. It was easy to get up and running with the API, and the team at Cirkus was very helpful all through the process.”

The project was completed on time and on budget, and after an initial trial period with a limited number of freelancers, the Cirkus workflow has now been rolled out to all of Able’s freelancers. The result has been significant reduction in management resource, and an increase in freelance work completed.

Visit www.cirkus.com to learn more about Cirkus, or reach out to Gencom (www.gencom.com) to get started!

EditShare

Flexible, collaborative workflows for the next generation of talented film, television and games makers

Based in Beaconsfield, to the west of London, the National Film & Television School (NFTS) has been nurturing talent in the industry for over 50 years. Our graduates include the Oscar-winning cinematographer Roger Deakins, Oscar-winning animator Nick Park of Wallace & Gromit fame, and acclaimed directors like Lynne Ramsay and David Yates.



Dr Jonathan Wardle
Director, National Film & Television School

We offer more than 30 MA, Diploma and Certificate courses, and have more behind-the-camera courses than any other film school. We are proud to be recognised as a model of excellence, and we are consistently listed as one of The Hollywood Reporter's top international film schools.

So, you can imagine how scary it felt when, back in March 2020, I had to send an email telling all our students that the gathering pandemic meant we had to close our doors.

The NFTS is a very hands on, practical school. Students 'learn by doing', making films, television shows and games to an exceptionally high standard in real studio environments. Transitioning online was going to be a mammoth task but we also saw it as a major learning opportunity for us as well as our students. We have always had a policy of going where people need to be trained, and this was going to be an extension of that philosophy: to see how much we could do remotely.

We already had a strong technology platform, built around a very large EditShare multi-node EFS storage platform, along with FLOW asset management and workflow software. We currently have 308 users and 200 media spaces on the system, which correlates to 200 projects. EFS and FLOW are ideally suited to cloud connectivity, and as remote collaboration is likely to be a key part of the future of television and film production it should be a key part of our curriculum.

Our students had already told us they wanted greater flexibility. No one wants to sit in an edit suite until 1am waiting for something to render: they would rather set something off, go and participate in student life, then come back to it.

That is one of the great benefits about using cloud-based tools: it enables us to model the sort of good work/life balance that we might want to see adopted by the industry, and show our students how to make it work to their advantage.

In the craft roles to which our students aspire, flexibility is the key. Sometimes they will want to be sitting in the same room as the director and cinematographer, collaborating directly. But equally, they do not want it to take over their lives. Cloud-based services enable them to decide how they work, project by project, day by day.

A central part of that flexibility is that they should focus on the craft of what they are doing rather than being forced down a particular technological route. We do not specify which tools the students should use, as long as the workflow makes sense. Our students have access to editors from Avid, Adobe and Da Vinci; our colourists use Nucoda, Baselight and Resolve.

We can do that because our EditShare storage platform is completely application agnostic. It happily supports content from any device, even allowing projects to flow seamlessly between applications from different vendors.



Our courses are almost entirely practical, so access to media is the biggest challenge. Our requirements are actually slightly more demanding than most productions, because we have so many projects running in parallel, with tutors needing a view across not just one but multiple projects.

Each project has an EditShare Workspace. Students and tutors involved in that project all have access to the same material from the same point of contact, whether that is to watch rushes, edit or add VFX, or to check the latest cuts. Tutors can make comments on the timeline, so it is very easy for students to get feedback as well as work collaboratively, wherever they are working.

What all this means for us – and for our strong relationships with vendors – is that we are often at the vanguard of what users are doing with technology. Our students like to break things: they push everything to the boundaries. If a system can be student-proof, it will be completely fine in the professional world. Our technology partners understand that the feedback from our students is particularly valuable.

We want NFTS students to learn best practice principles. In post, that means understanding how to access materials, and how to manage assets so that a single source can serve multiple different devices.

Our growing reliance on cloud connectivity and remote collaboration may have been forced upon us, but it has proved beneficial in enabling stronger collaborative working between people working remotely. Our technology platform, built around EditShare EFS and FLOW, has supported these collaborations by making it easier to communicate and share. And that is definitely the future for the industry.

For more information visit: www.nfts.co.uk





7Mountains

A look into TVNZ and the revamp of their newsroom to cloud

7Mountains, the creators of cloud newsroom solution DiNA, recently announced a new milestone deal with Television New Zealand. TVNZ has chosen DiNA as their core journalist tool, in order to transition to a native cloud based newsroom. DiNA will sit at the heart of the newsroom for creating, planning and publishing news to all of TVNZ's linear and digital platforms.

The project will be delivered in conjunction with 7Mountains technology partner Stem Media, with the development, installation and implementation of DiNA done remotely from Norway, close to 18,000km away.



Andrew Fernie
*General Manager of
Operations,
News and Current
Affairs, TVNZ*



Mads Grønbaek said in the announcement of the TVNZ project: "DiNA is built from the ground-up on modern web technologies and runs in the cloud. This means that we can deliver projects remotely and highly efficiently, benefitting both the customer and our team."

Transitioning to cloud at TVNZ

We spoke with Andrew Fernie, General Manager of Operations, News and Current Affairs at TVNZ about their ongoing project with moving their newsroom to the cloud, the workflow requirements and expectations.

What is the background for this project for TVNZ?

Some of TVNZ's news production processes haven't changed in 25 years. Given their age, they can be

difficult to change, adapt or integrate and are primarily designed to deliver to broadcast outputs. We want to simplify the workflows for our editorial teams. With the solution from 7Mountains, we will deploy a single system that covers planning and deployment, editing and production to multiple publication points – both linear and digital.

How will this change the way your journalists work?

With DiNA we equip our editorial teams with one unified user interface. This means that there's no need to jump around multiple tools to create and publish content which allows our journalists to work more efficiently. This will be a huge relief for our editorial teams and enable them to work far more efficiently. With DiNA at the core of our newsroom workflow, we allow our journalists to plan, investigate, collaborate and tell stories that matter and then deliver to all platforms with ease.

What convinced you to choose DiNA as your next newsroom solution?

When starting this project, we were, as many other broadcasters, in need of simplifying our workflows and equipping our teams with tools that require less maintenance. We needed tools that are more efficient, that allow for creative freedom for our editorial teams, and that scale. To accomplish this we looked for a vendor that is at the forefront of cloud technology, and that also had the experience and understanding of traditional journalism and production workflows. 7Mountains and their product DiNA caught our eyes in 2019 where we got a chance to sit down with the

team at the IBC show, to see a live demonstration of the tool. We have followed their projects closely since then, with the soon-to-air new British TV channel GB News, the launch of OTT business channel ausbiz, as well as Danish TV 2/ FYN and their transition to a cloud based newsroom.

What were your main workflow requirements for your newsroom?

We required a tool to allow our journalists to plan, investigate, collaborate and tell stories that matter and then deliver to all platforms with ease. We wanted to move away from working in silos with news for web, linear TV, social TV and more, in teams that could not collaborate efficiently and share resources. By choosing DiNA, we knew that we'd end up with one tool that encompasses the planning, creation, and publishing of stories to linear TV, our digital platforms and to social media.

What does your new workflow look like for your editorial teams?

DiNA can be accessed from a web browser from anywhere with a connection to our network. This gives our journalists the ability to work from anywhere, although they will have their base at our newsrooms in Auckland, Wellington and Christchurch.

Journalists working in DiNA can plan, prepare and create content for all programmes and platforms and publish to linear TV via an integrated rundown module that plays nicely with our Mosart automation system. From within the same story container, they're also able to push to our digital platforms through our CMS, and to Facebook, Twitter, YouTube and Instagram.



Resource bookings can be made from within a DiNA story, with a tight integration to ScheduALL, our booking and resource management system. DiNA integrates with media asset management system Viz One by Vizrt and with Avid Interplay. The integrated workflow allows our journalists to search for videos from both of these platforms simultaneously, when creating their stories.

How will the system be rolled out in your organisation?

The amazing thing about cloud solutions is that setup and deployment can easily be done without the need of onsite technical support, as we normally require for projects of this size. The 7Mountains team will set up the solution for us remotely from Bergen, Norway. We then have the local support from the Stem Media team.

What are your editorial team most excited about with this major change?

I would say that having one unified user interface across our editorial teams is what we are most excited about; at least now for the roll-out and early phase of the project. This is a major benefit for us and something everyone really is looking forward to. This means that there's no need to jump around multiple tools to create and publish content, which will allow our journalists to work more efficiently. We want to allow our journalists to plan, investigate, collaborate and tell stories that matter and then deliver to all platforms with ease.

And when do you go live with DiNA?

We are on track for going live with DiNA and with the integrated production workflows in August.

About TVNZ

TVNZ is New Zealand's state-owned, commercially funded broadcaster. Each day, TVNZ reaches more than 2 million New Zealanders through channels TVNZ 1, 2, DUKE and online platform, TVNZ OnDemand. Leading news site, 1news.co.nz and socially driven online news brand Re:, connect Kiwis to the important issues however they choose to engage. 1 NEWS forms the backbone of TVNZ's content offering, providing New Zealanders with live and breaking news throughout the day, both on air and online. 1 NEWS at Six is Aotearoa's highest-rating bulletin, reaching over a million viewers each night. <https://www.tvnz.co.nz/>

About DiNA

7Mountains is a software company that is part of Fonn Group. They are the inventors of DiNA, a cloud news and storytelling tool for content creators. DiNA is built with modern, web-based technology and with the end-user in mind, bridging the gap between news production for TV, social media and online.

Article first published by InBroadcast [here](#).

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Disney now has more subscribers to their streaming services than Netflix. That's an incredible growth rate over four years compared to the 10+ years it took Netflix to get to over 200 million subscribers

TMT Insights

Q&A with TMT Insights COO Hannah Barnhardt and CEO Andy Shenkler

Q. Tell me about TMT Insights and how it got started.

Hannah Barnhardt: Andy and I started TMT Insights thinking we'd take on a few strategic professional services projects. Much to our surprise – and we're grateful for it – the company has grown rapidly, and our client list today includes some of the most innovative global media brands.

We deal with all aspects of production and distribution workflows, helping clients in the M&E world streamline their existing processes or reimagine an entire end-to-end supply chain. Our professional services include a mix of traditional consulting, CXO advisory services, and software development, while our core focus sits with architecting, building, and implementing complete media supply chains for streaming, fast channels, linear broadcast, and other distribution models. For some clients, we also provide outsourced DevOps, technical support, and vendor management, which includes managing the infrastructure for their backend platform and tech stack. To complement those services, we created Polaris, an operational management system that unifies and surfaces information from various subsystems behind a single pane of glass, giving users the visibility, they need to work collaboratively and efficiently across their cloud-enabled media supply chain.

Q. TMT Insights helps M&E companies prepare for what's next. What's your forecast for the industry?

Andy Shenkler: It's a pretty interesting time right now because we're seeing many counterintuitive indicators. Disney now has more subscribers to their streaming services than Netflix. That's an incredible growth rate over four years compared

to the 10+ years it took Netflix to get to over 200 million subscribers. As that data emerges, we're also seeing hiring freezes and layoffs across the industry. While there has been trepidation about the amount of money being spent on new content, there also has been an enormous push over the past two to three years, with COVID, toward globalization of content and an immense amount of original programming created across all these different platforms.

Everybody's trying to figure out if these mixed signals indicate that we're growing or we're stalling. Because cash was cheap and everybody was in this massive 'space race' for the streaming wars, the industry had access to an enormous amount of cash over the past several years. I think we're now going to see a response from the financial side of the world; companies will start to hedge and pull back. With some stunning decisions being made around content right now, we're seeing seismic shifts in how companies are re-positioning themselves.

Q. How is TMT Insights positioned to guide M&E companies into the future?

Andy Shenkler: During changing times, you can't simply take a lever and switch direction at the drop of a hat. I mean, you can, but it could have unintended consequences. That's why the technology and operations teams within media organizations need to be able to respond to new challenges and opportunities as they arise. Our goal is to help them navigate those paths and remain nimble.

Because our team has a long history building and running enterprise media operations at scale, we've been through different cycles of change. We come to every project with a unique depth of experience and understanding, so we're prepared to jump in and help without a learning



curve. That's why TMT Insights has been able to grow so quickly. As soon as we start talking with clients, they realize it will take just a couple of weeks of engagement, not months, for us to align on what they're trying to do. In fact, the script often will flip, and they start to ask us if they're heading the right direction. That's a pretty unique position for our business to be in, given the fact that there is so much uncertainty about what's coming next for the industry. But we're really proud to have the right people, experience, knowledge, and solutions to deliver.

Q. Why did you decide to join IABM?

Andy Shenkler: The challenges of COVID drew everyone together because we were all thrown into the same chaos. In response to those shared challenges, the industry pulled together a strong fabric – a willingness to come together in joint problem-solving. It's critical now to make sure we don't go back to a world in which everyone pursues only their own directions and interests, pulling that fabric apart.

Organizations such as IABM benefit the industry because they help to maintain a valuable commonality of conversation, a shared philosophy about working together to address whatever the future may hold. They help to preserve the fabric that holds the industry together and bring collective benefits to all businesses. We feel it's important for us to be part of that effort and that community.

Hannah Barnhardt: IABM does an exceptional job of providing multiple outlets – from research to networking opportunities to events – to bring together different minds and perspectives on topics that are important to the industry. Whether it's finance, technical engineering operations, or any other aspect of the business, the organization plays a vital role in continuing the discussion, enabling collaboration, and fostering positive forward momentum, all in a transparent fashion.

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