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JOURNAL 118

REPRESENTING THE BROADCAST AND MEDIA TECHNOLOGY INDUSTRY WORLDWIDE

Data-driven Media Supply Chains

IABM members take a closer look at how data is transforming the media and entertainment industry

Also Featured

New, expanded IABM Board of Directors elected

IABM announces Diversity Action

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

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Driving change and equal opportunity

Peter White
CEO, IABM

Welcome to the Q3 2021 edition of the IABM Journal. IABM's theme for this quarter, carried across all our activities including Journal, is Data-driven Supply Chains, and this edition includes a host of authoritative articles that look at how data is transforming every stage of the media supply chain. I haven't seen such a comprehensive range of information on the 'new oil' in Broadcast, Media & Entertainment technology brought together in one place before, and I would thoroughly recommend setting aside some time to give it all an in-depth read.

With the immediate future of in-person events still clearly very much up in the air following the cancellation of NAB Show last week, IABM will be continuing to support members with our full array of digital capabilities. While there remains an overwhelming desire for a return to in-person events, it is also becoming clear that these may change in emphasis in the future, and digital is set to remain an important part of the marketing mix in the post-pandemic world. With the huge amount of experience we have gained over the last 18 months, your association is perfectly placed to help keep members in front of their customers' digital eyeballs and I am certain that for the considerable number of new members we continue to attract, this is an important consideration.

Following the unanimous approval of a special resolution at our AGM in July, our now expanded, newly elected Members' Board has set to work. The article on page 8 gives a run-down of the new Board's membership. The driving factor behind the decision to enlarge the Members' Board was the massive transformation we've seen in the industry – and our membership – over the last few years, with many innovative new businesses across a much wider spectrum of technologies and operations springing up alongside more established companies. The new Members' Board really reflects this diversity and I am greatly encouraged by the wide range of experience, new thinking and energy it will bring to all IABM's activities.

Our drive to embrace diversity doesn't end there; in July, as a result of the Big Debate on diversity in our industry during the June edition of BaM Live!™, IABM announced that it will form an industry-wide Diversity Action group. Its aim is to champion diversity and inclusion in the Broadcast, Media & Entertainment industry and providing a forum for Diversity Action group members to share knowledge, experiences and best practices to drive change and equal opportunity for all. IABM has appointed two Diversity Champions to set up and run Diversity Action: our CFO, Lucinda Meek, who is also its chair, and Head of Membership Engagement, Lisa Collins. You can read more about the IABM Diversity action group on page 10.

It was with great sadness that we learned of the death of Utah Scientific founder and long-standing IABM Honorary Member and supporter, Lyle Keys, in July. When accepting his Honorary Membership in 2007, Lyle said: "The IABM has strived to be the global voice of broadcasting technology suppliers, and it is a privilege to serve the organization as an honorary member". His contributions to IABM and across the industry will be greatly missed. A tribute to Lyle can be found on page 64.

With global warming consistently topping news bulletins – and many of us directly experiencing its effects – carbon emissions remain a top priority in every industry, and are very much at the forefront in BM&E. The Sky Zero initiative, launched in March this year, working with COP26, produced what may be a real milestone this month in the march towards zero emissions activities. The Tottenham Hotspur v Chelsea Premier League soccer match on 19th September was billed as the first net-zero carbon football match at elite level. While the result of the match itself was not welcomed by Spurs fans such as me (Chelsea narrowly beat us 3-0), the fact that carbon neutral activities at such a scale are now being undertaken gives us all hope for the future – except for Spurs fans of course: pessimism is our natural state of being, based on long and bitter experience!

As our CTO, Stan Moote, reflects in his opinion piece on page 4, "the future is positive – yet still largely undetermined". I look forward to continuing to work with all IABM members to help shape that future to the benefit of us all.

Peter White
CEO, IABM


HOME WORKING
REMOTE PRODUCTION
CLOUD AUDI
COVID QUALITY
VIRTUAL SET
FACE TO FACE

Healing or Reconciliation?

Stan Moote
CTO, IABM

Looking back at 2020, one must wonder if the world got larger or for that matter smaller. Before 2020 we always made reference to the world being smaller due to travel and technology/networks bringing people closer together.

2020 certainly caused a huge limitation in travel (even within countries and local regions); however the media and entertainment industry quickly took advantage of non-broadcast technologies to keep 'on-air'.

Everyone working within the media content chain deserves to be applauded for the hard and innovative work done in 2020. Languages aside, certainly activities and viewer interests became more regional, yet with people working from home, short of time zones, distance was not relevant. Tools like Teams, Zoom, Google Meet, WebEx. etc. definitely kept people connected. That indefinable 'spark' that face-to-face so often brings to creativity was perhaps inevitably somewhat curtailed, but the innovations to keep productions happening jumped to the forefront.

Who would have thought that virtual or 'cloud audiences' would be acceptable for practically any event?

On talk shows, while in the past it was only on rare occasions that teleconferencing solutions would be used, now they are completely acceptable. This being said, remote production activities do work, however viewers are anxious to have just about any entertainment when trapped at home, so what I call COVID Quality suddenly became tolerable and used with little objection.

So here we are three-quarters into 2021 and when we think back a year ago, we all pretty much thought there would be a 'new normal' that resembled something very close to the way life and businesses operated in 2019 by now. The exception would be taking advantage of the industry's acceptance of cloud and remote production tools.

Our industry has always been pretty much on the optimistic side of life and keeping on with business and productions as much as possible. Take coverage of the Tokyo 2020 games for example: we accepted the delay for a year, pushed on anyway not knowing if it would be cancelled or not, and to this end used more and more remote and virtual set technologies then we would have imagined in 2019 or even 2020! The learning curve was steep. There was

little time to figure out processes and tools to make Tokyo 2020 a success, yet the industry did this and now has created a complete new reference blueprint for use on large-scale games over the next decade (hopefully, though, with actual people in audiences at the venues!).

COVID caused our somewhat cautious industry to leap ahead by at least five years in accepting new technologies. This is in part due to viewers being so anxious to get new content, by just having sporting events happening and also live venues underway again, viewers readily accepted the occasional inevitability of less than five 9s (99.999%) of reliability and also compromised quality. But will viewers accept this in the future? Has COVID Quality become the 'new norm'? My guess is that we'll eventually end up somewhere between the two extremes: the world didn't end when 'broadcast quality' slipped, and that's not escaped the industry's attention.

Even if we theoretically could, we will not practically be able to put everything we've come to accept back in the old box and lock it up again, out of sight and mind! The only question is, what is the cut-off point where the consumer turns away – the dreaded churn rate? I have no doubt there are plenty of AI/ML algorithms working on this right now...

So is the world smaller or larger in 2021? Is the future bright and positive for the rest of 2021 and moving forward to 2022? We have taken broadcast down to a universe of ONE – providing just about any content a single person would want on any device from virtually anywhere in the world. Both advertising and content is becoming more targeted; these improvements are certainly not mature yet, hence still evolving. My opinion is the approach for the future will continue to require total agility in 2021/2022 and unquestionably not thinking we will have a clean start for 2022. Our customers (viewers) appear to clearly know they want a continuous stream of new and fresh content, yet have learned how to seek out niche and older repurposed content which makes the universe of ONE even more challenging for suppliers of products and services for the M&E industry. Everyone has fought the fires created by COVID.

So what's the verdict? I would contend that we are still in the healing process from this massive industry upheaval, but are beginning to reconcile it within our own minds and business units: the future is positive – yet still largely undetermined. Now is the time to work together to plot out fresh directions for the next decade and foster more innovation within our industry (virtually and in-person!).

Find out more

at

www.theiabm.org

iabm

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

New, expanded IABM Board of Directors elected

Broad spectrum of experience, thinking and energy set to power IABM strategy through 2023

IABM recently announced the results of its biennial election of Board Directors. The number of elected member companies represented on the Board was increased from 15 to 20 following the unanimous approval of a special resolution at IABM's Annual General Meeting on 22nd July 2021 to 'widen representation and better reflect the level of diversity in IABM's membership: including for example representational diversity in size of company, regions in which our members are based, type of company and gender diversity'.

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IABM is owned by its members, and the Board is both made up of members and voted for by members. The Members' Board serves a two-year term and plays a central role in the association's activities.

The newly elected member companies and their nominated representatives are:

- ARRI – Peter Crithary, *Vice President, Marketing and Market Development*
- Bitmovin – Stefan Lederer, *CEO and Co-Founder*
- Comcast Technology Solutions – Doug Triblehorn, *Vice President of Global Sales, Content and Streaming Provider Suite*
- Elevate Broadcast Pte Ltd – Dennis Breckenridge, *CEO*
- EVS – Nicolas Bourdon, *CMO*
- Fonn Group – Ingrid Agasøster, *Chief Operating Officer*
- Imagine Communications – Glodina Connan-Lostanlen, *Chief Sales Officer*
- latakoo – Jade Kurian, *co-founder and President*
- NEP Group – Andrew Jordan, *Global CTO*
- Pebble – Alison Pavitt, *Director of Sales and Marketing*
- Red Bee Media – Steve Russell, *Chief Product Officer*
- Ross Video – Chris Lennon, *Office of the CTO: Director, Standards Strategy*
- Sony Professional Solutions Europe – Peter Sykes, *Strategic Technology Development Manager*
- Telstra Broadcast Services – Anna Lockwood, *Head of Global Sales*
- Verizon Business Group – Josh Arensberg, *Global Head of Business Development, Media & Entertainment*

The newly elected members join five continuing members (elected by the outgoing Board for continuity), who are:

- Lawo – Andreas Hilmer, Director Marketing and Communications (Chair)
- Pixel Power a Rohde & Schwarz Company – James Gilbert, *CEO and Co-Founder (Immediate Past Chair)*
- Avid – Anne-Louise Buick, *Vice President, Global Field and Channel Marketing*
- Grass Valley – Tim Shoulders, *CEO and President*
- Multicast – David Phillips, *CEO*

In addition, the Chairs of the APAC, EMEA and Americas IABM Regional Members' Councils – Alex Timbs of *Dell EMC*, Thomas Gunkel of *Skyline Communications* and Paul Stechly of *Applied Electronics* respectively – have seats on the Board. Vice Chair Nathalie Schwarz, Non-Executive Director Christine Losecaat MBE, IABM CFO and Company Secretary Lucinda Meek and CEO Peter White complete the IABM Members' Board line-up.

"We had a record 28 high quality nominations for Members' Board seats this year, and I would like to thank everyone who put themselves forward for election," said Lucinda Meek. "I'm looking forward to working with this inspirational group of people to guide IABM's strategy and activities over the next two years so that we can deliver even more value to our members worldwide."

"Firstly, I extend a warm welcome to all our Board members, new and returning, and am very much looking forward to working with them to keep our Association vibrant, ever-more relevant and supportive of members' needs," said Peter White. "I am delighted that the members voted for expansion of their Board. Over the last few years, we have seen a massive transformation in the industry, with innovative, new businesses across a much wider spectrum of technologies and operations springing up alongside more established companies, which have themselves successfully embraced change. The new Members' Board really reflects this diversity; I am excited and energized by the wide range of experience, new thinking and energy it will bring to all IABM's activities."

For further information on the IABM board and hear what they have to say, visit www.theiabm.org/iabm-board/

IABM is ideally placed to be the fulcrum of that collaboration – the champion of diversity. We have the facilities, the forum and most importantly, the commitment to equal opportunity and education to be the industry's champion of diversity.

IABM CEO,
Peter White

Diversity Action

IABM announces Diversity Action

"Ensuring everyone has equal opportunity to be the best they can be"

Lucinda Meek
CFO and Chair of Diversity action

At the end of July, IABM announced that it will form an industry-wide Diversity Action group with the aim of championing diversity and inclusion in the Broadcast, Media & Entertainment industry and providing a forum for Diversity Action group members to share knowledge, experiences and best practices to drive change and equal opportunity for all.

The decision to form Diversity Action follows the Big Debate session which closed the June IABM BaM Live!™ event, where leaders from a number of national and international diversity organizations debated 'Getting to grips with diversity in Broadcast, Media & Entertainment'. During a lively and informative session, it became clear that the sharing of ideas and best practice could accelerate diversity and inclusion initiatives across the industry.

Announcing Diversity Action, IABM CEO, Peter White, said: "Almost as soon as the Big Debate started, I could sense a shared 'lightbulb' moment where it became obvious to all the participants that collaboration between their organizations would be immensely beneficial in accelerating diversity and inclusion globally. With its international reach and membership, and commitment to connecting and informing the entire global industry, IABM is ideally placed to be the fulcrum of that collaboration – the champion of diversity. We have the facilities, the forum and most importantly, the commitment to equal opportunity and education to be the industry's champion of diversity. We can help deliver meaningful action to level the playing field for everyone irrespective of race, ethnicity, gender, orientation, age or ability difference and so ensure that all have equal opportunity to be the best they can be."

IABM's Lucinda Meek – CFO and Chair of Diversity action, and Lisa Collins, Head of Membership Engagement, as IABM's Diversity Champions, will be instrumental in setting up and running Diversity Action.

Lisa Collins, who chaired the Big Debate, said, "Collaboration is key, and IABM is already working with many organisations on a global basis. So it is well placed to raise awareness of the message on diversity, to share experiences and best practices, and drive the change that will make our industry a better place. Working together through Diversity Action we can enhance the health, vibrancy and equality of our industry and raise standards on a global basis."

"Whether related to accessibility, gender, ethnicity, age or sexual orientation, IABM's commitment to an inclusive industry is top of our agenda," said Lucinda Meek. "Announcing Diversity Action is just the first step – we are committed to making a real difference and quickly; it's all about meaningful action from the ground up, not just another talking shop. We are proactively seeking committed individuals and organizations from around the world to take advantage of the international forum for the exchange of experiences and best practices Diversity Action will offer. We will shortly be convening the first of what we envisage to be regular meetings of Diversity Action, hosted on our new BaM Zone™ platform."

Watch the Big Debate on diversity and inclusion **here** on the IABM BaM Zone™.

Amagi: **With accurate data comes great opportunities**

Srinivasan KA
Co-founder,
Amagi

A closer look at how data is transforming the media and entertainment industry

Data is power.

Data is the new oil.

Data is the 21st century gold.

Data metaphors are a dime a dozen today, but they do make a point. Data is truly the driving force in today's business world, where insights on consumer behaviour drive go-to-market strategies. Nowhere is this more apparent than in the highly competitive Media and Entertainment industry, where viewership trends rule the roost. As a content owner/OTT platform, you could keep pace with the changes or become irrelevant. Remember how Netflix went from being a video-rental-by-mail company to the largest subscription-based platform in the world, with billions of dollars worth of content-spend? That was all data driven.

As a next-generation innovator, how can you leverage data to build a successful media venture? To answer that, you'll need to know what data can do for you.

Give your content strategy a facelift

As a broadcaster or a digital media company, your first priority should be to determine what content to acquire or produce, for which you'll need insights along the following lines:

Are you offering a 24/7 curated linear channel? If yes, should the content be repeated? If so, how often and when? Should you intersperse long format with shorter format shows, scripted with non-scripted formats? When should premium content be run?

A powerful analytics platform will give you conclusive evidence of what audiences like and dislike, thereby showing you impactful ways to create a winning programming strategy.

For instance, Amagi's ANALYTICS platform has determined from a sample of 650 channels across 15 top platforms in our FAST distribution network that News is the most sought-after content genre. Insights such as these are the bedrock on which great content strategies are built.

Ad conundrum? Not a conundrum anymore.

When it comes to advertising, the question remains the same: *what is the optimal ad load that works for platforms, channels, advertisers as well as audiences?* The rise of connected TV platforms clearly indicates that priorities have shifted. Freedom from ads is no longer a dominant criteria among viewers for choosing a service. But, the quality of ads – fewer and better – remains an essential component. Granular data on audience preferences extracted by robust analytics platforms can give you deeper insights and help you create successful monetization strategies.

Audience data can tell you when viewers stop watching your ads or switch channels, the ideal timespan to get audience attention focused on the ads, and more.

With these data points at your fingertips, you can develop customized ad strategies, serving ads that are not only engaging but also useful to your audience.

Boost your ROI with targeted distribution

Distributing your content to the right platforms is as crucial as building a programming strategy. Without reach, there is no ROI. By leveraging the insights derived from an analytics tool, you can learn where content works well and where it doesn't, which platforms garner the maximum viewership and engagement, what devices the audiences are hooked to, and more.

Amagi ANALYTICS was able to ascertain that 99% of audiences are consuming their content on Free Ad Supported Streaming TV (FAST) platforms today. Between January to June 2021, ad impressions on connected TV grew by 66%.

Reaching your target ROI becomes easy when you're armed with such information.

Spice up your strategy with the AI & ML flavor

A dynamic analytics platform can pull out data and convert them into digestible nuggets of information to help you spruce up your content, programming and ad strategy. Add artificial intelligence and machine learning to that mix and what you get is more granular real time actionable insights.

With AI & ML tools like Natural Language Processing (NLP), the data generated gains more depth and layers. For instance, you may have data to prove that your cooking channel is popular with the end users. AI & ML can take it one step further and tell you what cuisines they like. You can build on that by creating customized recommendations for your viewers, adding more

Amagi's ANALYTICS platform gauged that 9 out of the 25 top performing channels on our systems belong to the news genre

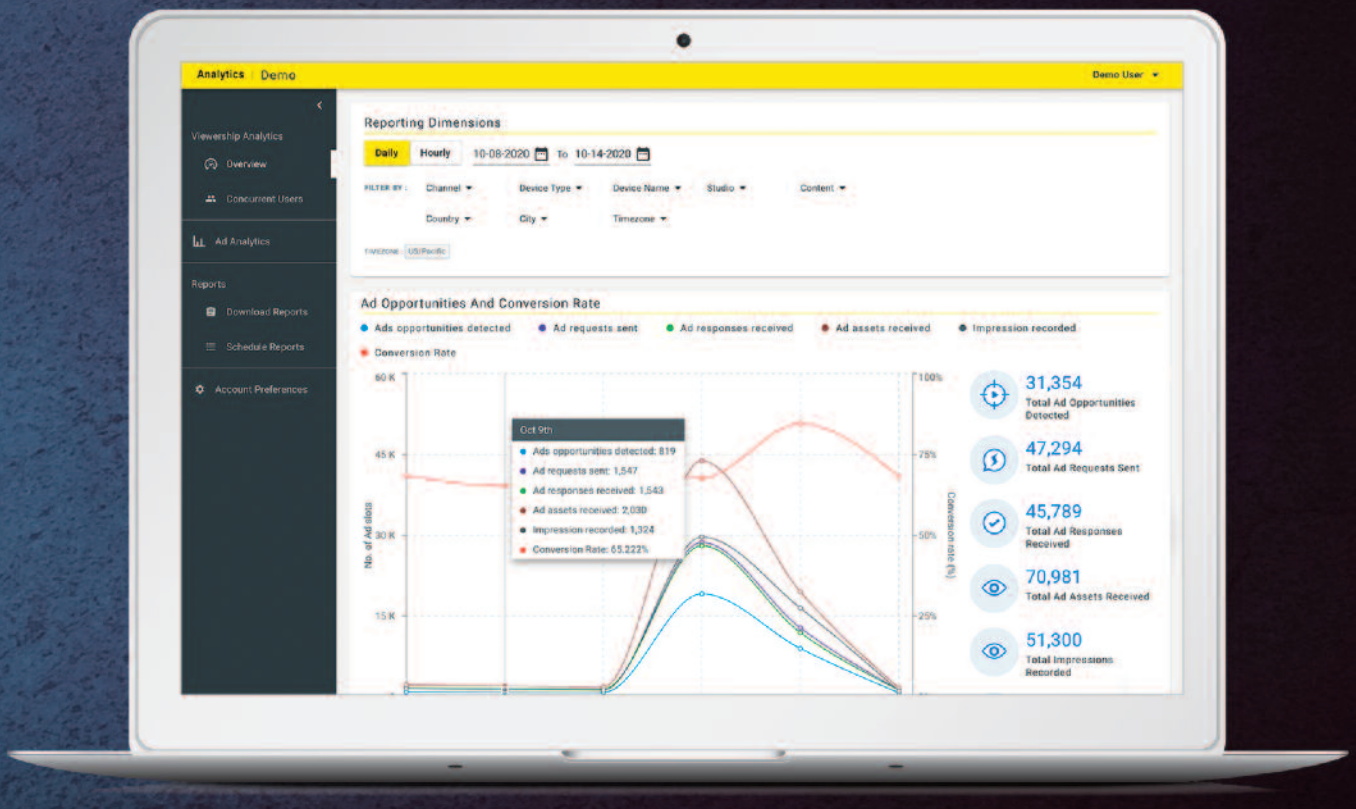
textual information to your content (subtitles and name-to-face associations), identifying scene boundaries for ad insertion, building search functions and more. Each and every stage of your programming and monetization strategy can benefit from the capabilities of AL & ML.

For instance, Amagi's ANALYTICS platform gauged that 9 out of the 25 top performing channels on our systems belong to the news genre. The news channels have been driving 30% of the total ad impressions in the first two quarters of 2021. Our numbers thus reflect that news is witnessing steady demand across FAST platforms. With this information, a content creator can spin up a linear news channel and distribute it to the most popular FAST platforms. AI & ML can then be employed to enhance the user experience by building a playlist of recommendations on trending topics by observing social media platforms like Twitter and Facebook.

Going back to the data metaphors that abound, in this scenario, data becomes the cake and AI & ML the icing.

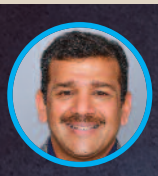
At Amagi, we believe that content is going to become more and more a data business. As a modern-day content creator and distributor, you can no longer choose to ignore this truth. While great content will continue to be essential to the success of your business, data driven decision making will differentiate the winners from the 'also-rans' in the industry. So why choose to survive, when you can thrive, with the power of data?

Reach out to Amagi to see how analytics 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.

Ateliere Creative Technologies (formerly Ownzones): Redefining Data in the Media Supply Chain



Arjun Ramamurthy
Chief Technology Officer
Ateliere Creative Technologies

We're all inundated with data every day: from being told the number of steps we've taken to new recommendations from Netflix or Amazon. With so much information being thrown at us, are we using this data to its best possible advantage? Do we even know how to do that?

It's no different in the media and entertainment industries, where every piece of content has metadata attached to it. This data ranges from how and when the content was captured, file type, descriptive, structural, preservative and more. When dealing with the often-massive libraries of most studios and other content-owners, the sheer amount of data available to a customer can almost be as overwhelming as the number of titles themselves.

It's imperative for organizations to start thinking about data differently -- learning to save, store and use their data in a meaningful way. That could mean establishing data storage and planning policies, to be able to source and search against the data accumulated over several years and run predictive models.

If organizations can capture, store and use their data properly, then they can start to take control of their own organizations by accessing meaningful insight into how they operate. They can automate workflows, reduce costs and streamline logistics.

This all impacts how they're able to address the market.

The Data-driven Media Supply Chains

Gathering data is easy but understanding and interpreting it to make more informed business decisions can be a complex process – unless an organization chooses a flexible and scalable cloud-based content supply chain partner such as Ateliere Creative Technologies (formerly Ownzones).

The overall advantages of having media supply chains be data driven is useful, however the goal has to be ultimately serving customer needs. Just having a ton of data for the sake of having data is essentially meaningless. We can provide a variety of data metrics, but all of that still has to support the content and the supply chain head ends we are providing.

A platform like Ateliere Connect can provide much of the data a business needs, but the customer is the one who knows best what information is needed so they we can get content as quickly as possible to any of the platforms that they wish.

The decisions still need to be business-driven. All the data can do is support it.

We've always had a lot of data to work with, from technical metadata to encrypted metadata and more. But the difficulty has traditionally been gaining a firm understanding of that data to make it actionable. Collecting data is only the first step. From there, what parameters are you setting for the data to make it actionable?

The data provided is not meant for customers to always take automatic

The Deep Analysis AI algorithm scans content to understand its layout and formatting. It then accelerates the traditionally long and manual process of content conforming and localization editing

action. It's provided as more of a toolset to help them make better-informed decisions. It's basically designing data-driven recommendations for customers to optimize their media supply chain. We never want to remove customers from making smart decisions. We're providing a lot more information for them to make those smart decisions.

It's about how data is being used, interpreted and applied. Using our platform and its features, we can slice, dice and provide metrics. But more important is helping customers drive their engagement with customers and deliver value to their audiences.

What Connect Does

The Ateliere Connect platform features a range of content enrichment capabilities. It employs cloud-based parallel computing (Amazon EC2 Elastic Compute Cloud web service) to transcode and package files. With the ability to scale up to as many processors as needed for each request, the studio can respond and fulfill customer requests regardless of size or complexity, quickly and efficiently. Using Amazon's recognition service allows the addition of extra metadata according to individual customer requests, whether for commercial, merchandising or compliance reasons.

The Ateliere Connect solution also incorporates the platform's Deep Analysis Artificial Intelligence (AI) tool. The Deep Analysis AI algorithm scans content to understand its layout and formatting. It then accelerates the traditionally long and manual process of content conforming and localization editing. By automatically identifying specific types of scenes or video elements and highlighting them on a timeline view, operators can focus their efforts primarily on the scenes that need adjustment, saving companies time and money. The AI portion provides the capability for reducing storage capacity and asset generation needs

The benefits of effective data mining, storage and use are wide-ranging.

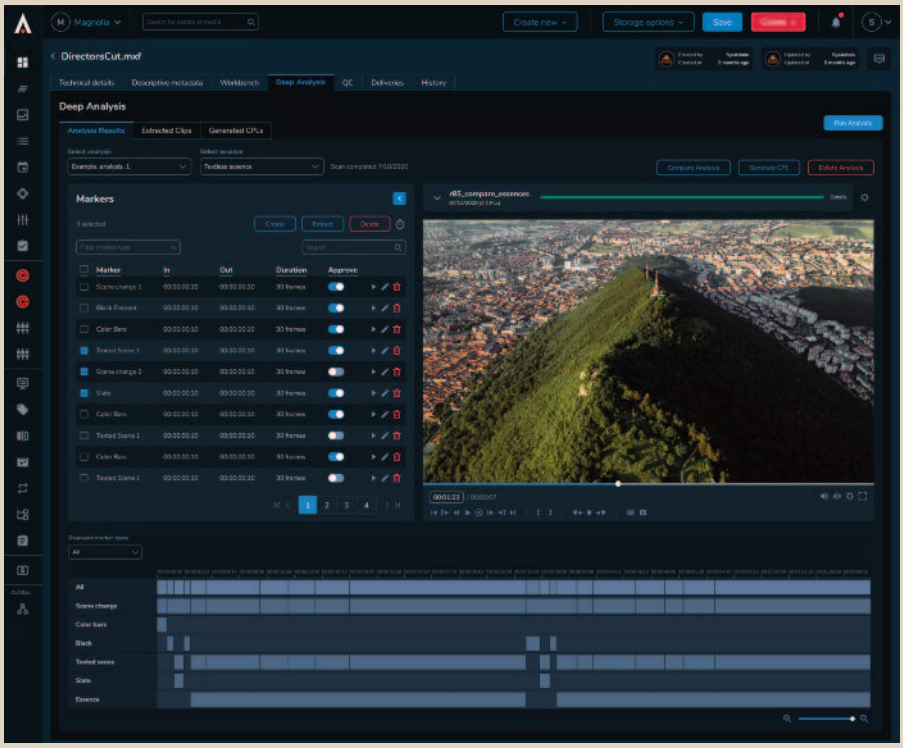
Libraries can be set up for maximum content monetization. When an order is received, the studio knows exactly which version of a title is available. If a requested version is not available, they can easily create one without much human intervention, manipulation and expense. Through automation and reduction of its storage footprint, studios can realize annual savings in the millions of dollars. Transcoding time is shortened by as much as 35X due to AWS EC2 cloud-based parallel processing, leading to increased customer response times.

Organizations of all sizes are becoming more sophisticated in how they approach and use their data. As this trend increases, technology providers need to keep pace to deliver the right support.

For example, since most of the content we handle is finished content, many customers may need markers placed within titles to identify spots in downstream versions for insertions or they may want to know from a QC standpoint where these actual points are and what is the allocation or information that they would want to associate with each.

Using data effectively will continue to increase in importance, especially with the demand for content growing across all platforms and the emergence of new platforms, formats and resolutions. As audience behaviors and preferences change, our industry's understanding of data tools and data extraction has to mature as well.

For more information on Ateliere and its Connect platform, visit https://ateliere.com/ or https://ateliere.com/connect/



Bridge Technologies:
Data driven decision making – what does it really mean?

Simen K. Frostad
Chairman, Bridge Technologies

What is a decision?

It seems like a simple question, but it's one worth considering. What separates the terms 'decision' from 'choice'? The general consensus is: judgement and deliberation. Whilst a choice can be entirely arbitrary in nature, decision making is 'process orientated', linking behavior with performance and consequence. In essence, decisions act on inputs to drive outcomes. So it follows that all decisions are 'data driven' – in the sense that 'data', most widely defined, constitutes information – the inputs upon which the decision making process is exercised.

The key ingredients of a good decision

Thus, the quality of a decision is really impacted by three central factors: the extent of information available, i.e. the number of variables for which information exists, the quality of that data – with quantitative generally preferable to qualitative, and the extent to which the decision maker is able to make use of that data – both by virtue of how comprehensible it is, and how effective and knowledgeable the decision-maker is themselves.

Once upon a time, these three elements were entirely lacking in a broadcast environment. Your network either worked or it didn't, and often the first you'd know about it was Mr. Jones on the phone complaining he couldn't watch the Snooker. Trouble shooting was long, tedious and laborious. In essence, the data needed was lacking in quantity, quality, responsiveness and usability.

Perhaps less of a problem when infrastructure costs once meant that only a few big players dominated the market, and Mr. Jones had nowhere else to watch his snooker. But now, in an environment characterized by endless choice and next to no switching costs for audiences? A very different story.

Decision after decision

Troubleshooting decisions constitute just one type of decision you might make in a broadcast environment, and – moreover – one you'd ideally like to avoid; if everything has gone well in your organisational decision making chain, you shouldn't be getting to the point where trouble-shooting decisions are even required.

In reality, decisions in the broadcast industry exist on a vast spectrum; they constitute the high level, boardroom decisions made regarding organizational strategy, and they constitute the millisecond decisions made regarding data paths through complex networks. Of course, at every point – regardless of scale – these decisions need effective metrics to support them.

Decision Blind

Of course, with this sheer scope and scale of decision making going on at the micro- and macro- level, it can be easy to become 'decision blind' – becoming entrenched in a process that uses the same outdated data points and unconscious biases, in an uncritical manner.

But critically revisiting these questions is key. Really – how much do you really know about your network, and how much are you assuming? About your audience and their experience? What data points are you currently getting to inform your decision; how relevant, timely and usable are they? Are you sure you're making decisions, rather than arbitrary choices?

Fundamental questions perhaps – but it's surprising how many people aren't asking them – instead laboring on with outdated information and unchallenged assumptions. And that's really the main thrust of what we're driving at here: When was the last time you considered something as fundamental as 'what constitutes a decision'?

Probing the depths

It will come as no surprise to hear that technology is offering at least partial answers to many of the challenges we've outlined above. Broadcast network monitoring has never been more sophisticated or comprehensive than it is now. When it comes to the issue of quantity and quality of data points, it's now possible to use probes to gain real-time, continuous insight across the full broadcast chain – from ingest to contribution to playout – giving metrics on every component of technical network performance. From the camera painter in a remote OB van, to a network technician working on a headend, to a boardroom executive ruling on next year's budget, probes have the potential to give the data needed to make effective decisions: able to generate the kind of data that facilitates millisecond operations on audio and video transfer across networks, accommodating the widest range of operational protocols, standards and configurations – compressed and uncompressed, whilst also generating historical reports that give a strategic, birds-eye overview of operational performance for management and decision makers.

But does this increase in the quantity and quality of data points result in better decision making?

Not necessarily.

Indeed, an overload of information can be as limiting as it can be enabling in the wrong hands. It's only if this data is packaged and presented in a meaningful way that it can form the basis of effective decision making, even for those not necessarily versed in the intricacies and technicalities of network performance and IP packet transfer. It's here where an effective monitoring system will really set itself apart: putting eyes at every stage of the broadcast chain to produce not just data, but *information* which is meaningful, usable and presented in a way that is intuitive to understand.

Joined up thinking

All of these concepts become even more complex in complex environments (hardly a shock, right?). It's all very well gaining insight along your beautiful, shiny, newly installed IP network. But who has the budget for such a revolutionary upgrade? The truth is, the majority of broadcasters are working with piecemeal, hybrid and legacy systems, where the data available to harvest is wildly different in type, meaning and significance.

It's this which has informed Bridge's evolving approach to the world of monitoring. We've backed the IP revolution for years now, and *always* focused on making data intuitive and usable (or 'making the complex simple' as we like to say). But increasingly, our focus has been on 'Integrated Services Monitoring' (ISM), an approach that harmonises the data gathering process – across both IP and 'traditional' networks – to give both broad and deep understanding across all components of the media chain; production to signal acquisition, contribution streams, OTT/streaming media, and traditional broadcast distribution across DTT or Satellite.

Furthermore, by evolving our three types of probe; embedded, appliance and software-based – to all run from the same v6 coding, then we've dramatically simplified the data analytics process across the chain; therefore making it more reliable, efficient and usable than ever before.

Because ultimately, in decision making, whilst you want as much data as possible, you want as little variation as possible when it comes to source, type and nature. It needs to be harmonized and consistent in its base if it is going to form part of an effective decision making process. ISM achieves this.

The future of AI needs solid foundations

We won't get into a debate here about what constitutes ML, AI, and what's simply good old fashioned if/then coding; – regardless, as networks become increasingly sophisticated, they also become increasingly automated – take for instance, the automatic configuration of IP addresses or the triggering of events when threshold alarms are reached. But as we stressed at the beginning, if you haven't critically considered *how* you're making decisions and what data you're using to make them, you're already backing a losing horse. AI and automation can only be as strong as the processes they're built on. And those processes are only as strong as they data they make use of.

So whilst data-driven, AI decision making may feel like a progressive, new-fangled solution in the world of broadcast, the truth is it's built on concepts of good old-fashioned decision making – a potentially useful add-on that is dependent on the building-blocks of understanding already being in place. Effective monitoring is the hearthstone of those building blocks.

Editors and content producers are now only limited by how fast they can make decisions

Digital Nirvana:
How AI Will Simplify Your Broadcast News Workflow

Large broadcast news operations ingest huge volumes of content every day, all of which must be logged and reviewed to determine which assets, illustrated by which video clips, will be presented to viewers. It's a tedious and time-consuming task, performed by dedicated teams who manually review incoming content and then describe or notate that content, which producers later access to produce finished news segments.

This process is compounded by the wide variety of delivery platforms – linear broadcast, OTT, various Multichannel Video Programming Distributor (MVPD) services, social media platforms and others – and each with its own formatting rules and other requirements. And of course, with news, time is in short supply and every second counts when turning around content and getting news to air.

Applying AI and ML technologies to news workflows can auto-generate highly accurate metadata of video content more quickly and less expensively than traditional methods, which yield big cost and time benefits for fast-paced news operations.

The key to delivering these benefits is in the ability to harness the power of these next-generation technologies. By leveraging high-performance AI capabilities in the cloud (speech-to-text, facial recognition, object identification, content classification, etc.), combined with powerful knowledge management orchestration tools, these metadata solutions deliver actionable intelligence for media operators and accelerate the search, retrieval, production and delivery of news content.

The solution described above is what one major broadcaster is using to enhance its existing news production workflow and incorporates several AI engines and three specific toolsets as follows.

AI engines include:

- Automatic speech recognition (ASR)
- Natural Language Processing (NLP)
- Text Translation
- Facial recognition
- Emotion recognition
- Logo detection
- Object identification
- Optical character recognition (OCR)

Toolsets include:

- Automated metadata creation for raw feeds and post-production content residing in PAM/MAM that applies advanced AI- and ML-based content analysis for automatic generation of better-structured, more detailed, and more accurate metadata. Media operations benefit in two key ways – first, with tremendous time savings in up-front metadata generation, and then by giving producers the ability to zero in on the assets they need right away.
- Closed caption/subtitle generation platform, which unites cutting-edge STT technology and other AI-driven processes with cloud-based architecture. This toolset radically reduces the time and cost of delivering accurate, compliant captions for publishing worldwide.
- Broadcast monitoring and compliance logging that allows operators to record, store, monitor, analyze, and repurpose content quickly and efficiently with a minimum of clicks. Integration with AI microservices enables powerful insights and video intelligence applications, including:
  - The ability to record, store, and retrieve content for compliance, quality of service, and insights into broadcast content.
  - Automatic transcription of content from live broadcasts and commercials.
  - Automated detection of logos, objects, faces, and shots.
  - Automatic extraction of on-screen text.
  - The ability to identify ad breaks in logged content.

- The ability to identify restricted words or topics in recorded/logged content, as well as the classification of incoming ad material for restricted content.
- Generation of automated reports for loudness compliance, QoE, SCTE inserts, and ad detection and identification.
- Automatic content classification.
- The ability to assess the quality and conformance of captions.

The solution uses a variety of AI and ML technologies to process numerous 24x7 live news feeds simultaneously from a wide array of sources. Concurrent, real-time processing of this quantity of content, is something no amount of personnel could ever hope to accomplish.

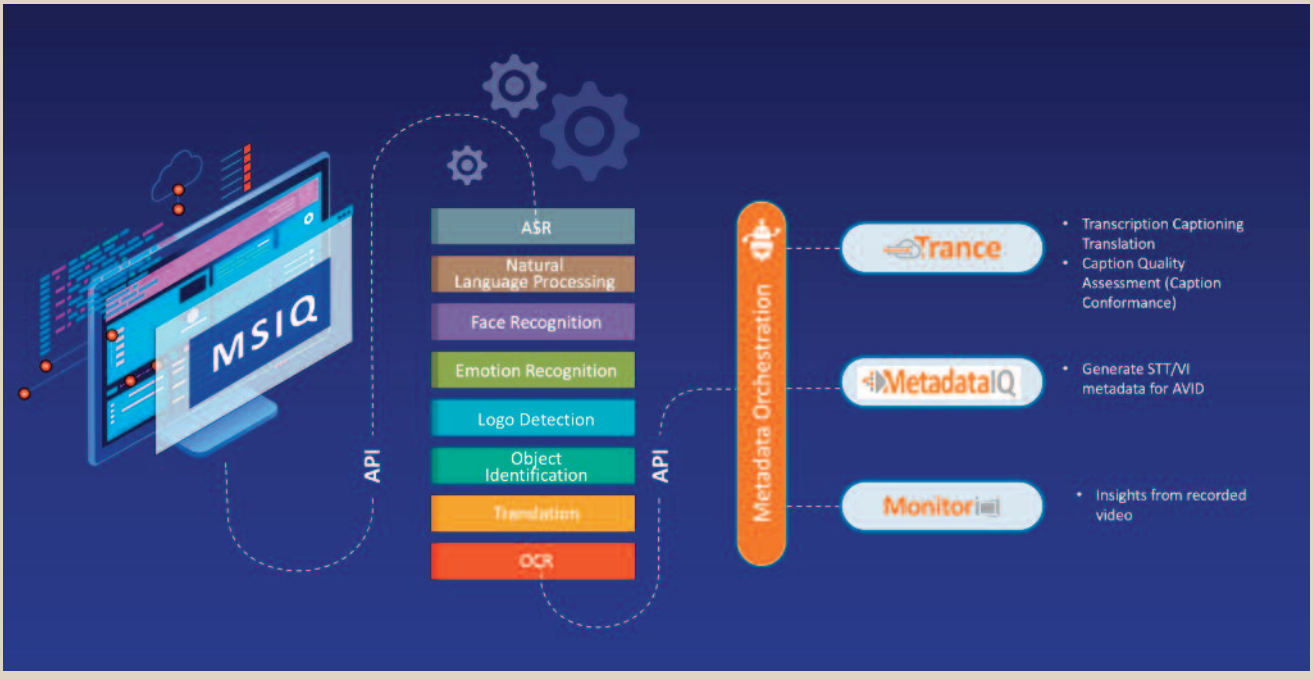
As feeds are received and ingested, they pass through APIs to all the applicable AI engines and on to an orchestration layer, where the solution automatically harmonizes and synthesizes the metadata and doles it out to the software tools mentioned above. Those high-value applications – the transcription, video metadata generation, and monitoring tools – take over, working in unison or individually as directed by the operator to provide intelligence and actionable insights that make the metadata usable. These capabilities enable intelligent and immediate logging and feedback of content quality and compliance, better positioning broadcasters to meet regulatory, compliance, and licensing requirements for closed captioning, decency, and advertising monitoring.

Importantly for news producers, the solution generates text in the form of transcripts of the spoken word. Transcript metadata essentially becomes a script of the content, which is time indexed back to the media within the edit and production environment.

In this enhanced state, producers and editors can quickly search for and retrieve relevant media assets needed to create their news stories, thereby accelerating the entire production process. This all happens automatically in real-time, with results being transferred back into the editing environment. Everyone within the editing ecosystem can get their work done faster, easier, and more effectively than with using traditional methods. Editors and content producers are now only limited by how fast they can make decisions.

While this solution is deployed for an ever-growing feed of live content, all of these capabilities could just as easily be applied to existing recorded content.

Using powerful AI capabilities available through an intuitive and functional software layer, easily accessible across the media enterprise, media professionals can expedite critical processes, reduce mundane tasks and accelerate the creative process – all while saving critical time and expense.



The right tools and the right information must be presented to each individual in the organisation, as they need it, with planned transfer of large blocks of content to minimize the risk of bottlenecks

Imagine Communications: The future for metadata

Darby Marriott
Product Manager, Production Playout Solutions at Imagine Communications

The Merriam Webster dictionary defines metadata as 'data that provides information about other data'. Some call it 'bits about bits'.

In the media industry, it is the information which tells you about the video or audio content. And, as such, metadata has been around a lot longer than the computer. If you still have film in your archive, you will expect to find shot lists on a sheet of paper inside each can. And, at the very least, archivists would have a card index to help find things on the shelves.

These manual processes broke down when we moved into storing content on video servers. When the essence is just ones and zeroes spread across a number of disk drives, then you need a database to track files and find them when you need them.

Asset management went hand in hand with broadcast automation, ensuring the programmes and commercials in the schedule were correctly identified for the playlist, and those files were loaded into the playout servers and cued at the right moment.

Today, we demand more from metadata. Schemas have grown ever bigger, with a huge amount of information on each piece of content. Some of this is descriptive, telling you what you have and who was involved; some of it is technical – everything from codec and aspect ratio to camera and lens serial numbers.

In a modern, connected production and delivery center, a large number of people will care about parts of the metadata, but – system administrator aside – no-one needs to know all of it. So the well-designed system will manage the data and the user interfaces to ensure everyone is perfectly informed without being overloaded with information.

To explain what I mean, think about the marketing department of a broadcaster. A great new series is being delivered, and you want to ensure it attracts the biggest possible audience. One of the ways that you do this is by creating a suite of trailers and promos.

The editor charged with the task of creating these promos does not care about any of the technical information – he or she will reasonably assume that the content is fine if it has made it to the live servers. All the editor has is a work order, saying 'take our standard trailer format and make a set for this new program.'

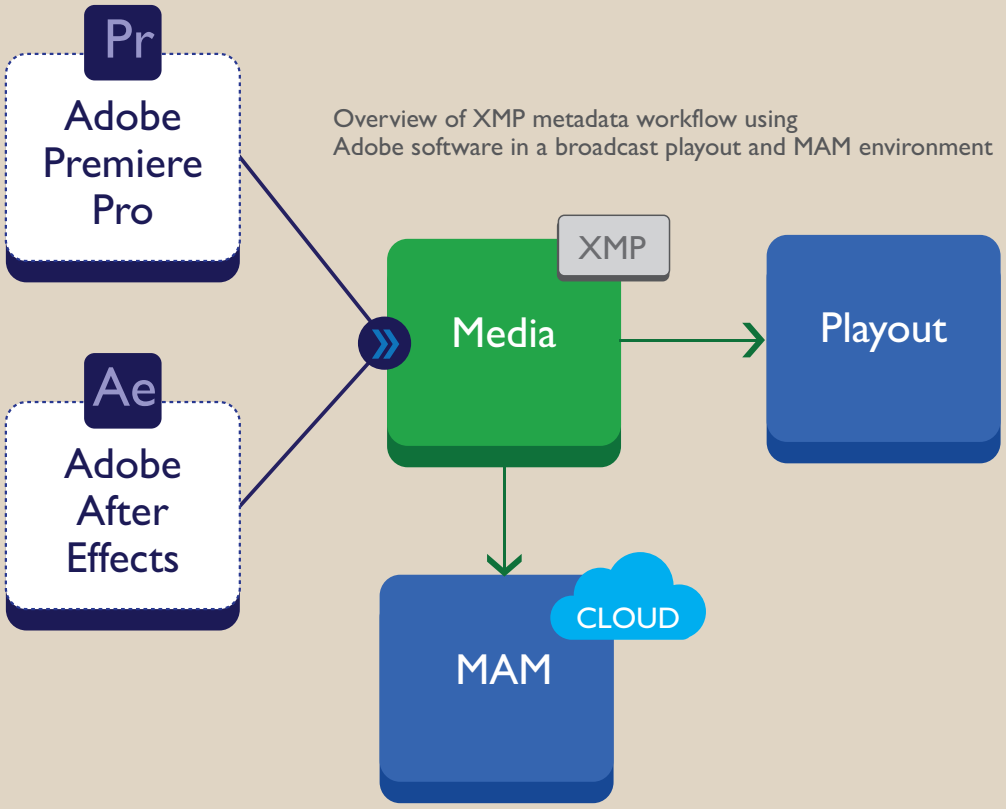
The editor may well be using Adobe Premiere and After Effects. Adobe has its own, excellent metadata format, XMP. A smart system design will integrate the overall asset management and playout system with Adobe so that, when the editor opens the work order, the content – from the video server and from the Adobe templates server – is already loaded into Premiere and is ready to go.

When the trailer is completed, the editor or graphics artist initiates the export process. The relevant XMP metadata is wrapped in the file where it is then exposed to the asset management system. This will also handle the generation of house-standard content IDs, and add them to schedules and playlists as needed.

A really smart system will integrate even more data: when to trigger coordinated live events. So rather than the graphic in the trailer just saying 'coming soon', it will say 'launches 1 September at 9:00pm', dynamically linked to the schedule information along with coordinated live DVE sqeezeback upon playback.

This metadata connectivity is all real and happening now. Promo teams use it; and newsroom editors use exactly the same workflow when a news package needs a craft edit with content from the archive.

Any news broadcaster will tell you that the archive is the most valuable asset they possess. Reporting a story is



Overview of XMP metadata workflow using Adobe software in a broadcast playout and MAM environment

one thing: putting it into the context of what has happened before, what people said in the past, what the consequences of an action are likely to be are all vital.

It is probably in the newsroom, then, that we will see the next big steps in the development of metadata. This will build on the intelligent automation and communication we have today, and augment it with machine learning and artificial intelligence to enhance metadata, with the aim of creating better content by knowing more about what is in the archive.

The pandemic is a good example. Since February 2020, politicians, medical experts, statisticians and citizens have all said a very great deal on the subject of Covid-19. A journalist reporting on a new development today will create a better story if it reflects back on what the parties involved have said in the past.

AI tools are now already available which can create very detailed metadata, completely automatically. The soundtrack can be automatically transcribed, so you can search for what someone said at a given time.

AI can now be applied to video analysis, creating shot lists and detailed information on the content of the clip or programme, with each incident tied to a timecode. This has obvious benefits in the newsroom, where journalists can quickly find exactly the clip they need.

But it has wider benefits, too: it is a powerful tool in discovery, whether that is in programme syndication or direct to consumers.

AI can, of course, be run on premises. But it is an obvious cloud use case. The major cloud providers, like Amazon Web Services (AWS) and Microsoft Azure, have their own powerful AI tools which can be trained to your specific requirements. Video and audio analysis is also inherently 'peaky', with long periods of inactivity interspersed with high processor demand when there is new material to be indexed.

Wherever you are in the broadcast and media production and delivery chain, the future of metadata is that it will become ever richer. Automated tools and machine learning will contribute greatly, as will the integration of multiple application-specific databases like Adobe XMP.

Critical to the success in benefitting from all this information is an over-arching integration and management layer. The right tools and the right information must be presented to each individual in the organisation, as they need it, with planned transfer of large blocks of content to minimize the risk of bottlenecks.

The future of metadata – in production and in delivery – will be the enabling technology for orchestrating workflows across every aspect of the operation.

In 2020, M2A media delivered hundreds of thousands of live events to over 80 countries, streaming more than 1 billion hours to millions of concurrent viewers

InSync Technology:

Live frame rate conversion in the cloud, on a pay-per-use basis

Paola Hobson
Managing Director, InSync Technology

Broadcasters and media companies engaged in live international content distribution are familiar with the need for standards conversion. Multiple broadcast frame rates and formats are in use throughout the world; and with an ever-growing number of standards to support in mobile and streaming services, high quality, live, standards conversion is an essential part of many businesses.

OTT streaming service providers are no different. These delivery workflows provide localised broadcast grade streams to a myriad of devices globally. Typically, these workflows run fully in the public cloud, receiving mezzanine quality transport streams from playout; and inserting dynamic content to produce localized versions, where reformatting, transcoding, packaging, encrypting and delivering to CDN are entirely located in the cloud.

Moving the workflow to the cloud

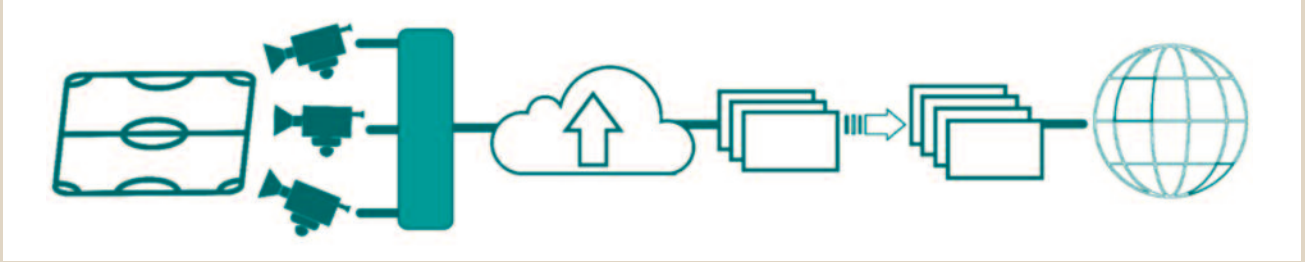
M2A Media are innovators in cloud broadcast; they work with some of the biggest names in the industry by helping them to connect with new audiences, realise greater commercial benefit and reduce operational overhead. In 2020, M2A media delivered hundreds of thousands of live events to over 80 countries, streaming more than 1 billion hours to millions of concurrent viewers.

Typically, an OTT customer's acquisition workflow might take live source content from events produced around the world and feed it into their playout service using IP transport in a public cloud. The customer will then want to deliver localized, broadcast grade streams to OTT devices globally. They would use a head end workflow running fully in the public cloud to receive the mezzanine quality transport streams, insert dynamic content to produce localized versions, reformat, transcode, package, encrypt and deliver to CDN with integration to a live ad insertion service. Both the acquisition and the head end workflows require frame rate conversion between 50 and 59Hz.

Many of these services include live streaming of sporting events of international importance. Frame rate conversion (standards conversion) is therefore needed in order to manage the multiple delivery formats and frame rates for each region. For example, US Football acquired at 59Hz needs frame rate conversion to 50Hz for European viewers. When streaming live sports, very high quality frame rate conversion is essential to ensure all viewers obtain the best possible experience.

Event-based services

When provisioning services or investing in equipment, it's important to consider that sporting events might take



place weekly for a specific season, or just for a two week period annually, or even for a short period every four years, etc. For such events, on-premise proprietary hardware represents a costly asset on the balance sheet which requires considerable effort and resources to be configured into the acquisition or head end workflows. Once in place it is costly to reconfigure hardware workflows so responding to last minute demands is typically not possible.

Broadcasters and media companies have shown a lot of interest in the integration of InSync Technology's FrameFormer motion compensated standards converter into M2A's cloud based services. This has created a unique service: where customers can access live frame rate conversion in a pay-per-use scenario and the service provider is orchestrating and gathering the end-to-end cloud resources needed to support thousands of live events each week.

The service also runs fully redundantly, with on demand capacity management, scaling and monitoring. This is very beneficial for unexpected situations e.g. event starts which get delayed by bad weather or over-runs such as extra time in a football match.

This type of pay-per-use standards conversion service isn't exclusively aimed at sports providers. It's a great cost saver for any broadcaster or content owner that has occasional conversion requirements. In this case, they don't want to have the trouble and cost of buying their own dedicated converter, and having staff available to run and maintain it. It's also available globally so there's no need to transport physical assets to events.

If you're paying to have a converter available 24/7 but only use it at the weekends, you save a lot of money using a conversion service and will see a much higher return on investment. The unique part of M2A Connect's FrameFormer integration is its status as the only live, cloud-based, pay-per-use conversion service currently available in the world.

For all of this to work, it has to be pure software, CPU-only. It cannot be reliant on GPUs as M2A need to provision an instance to run on and take down afterwards, hundreds of times a day. Therefore, it has to be consistent.

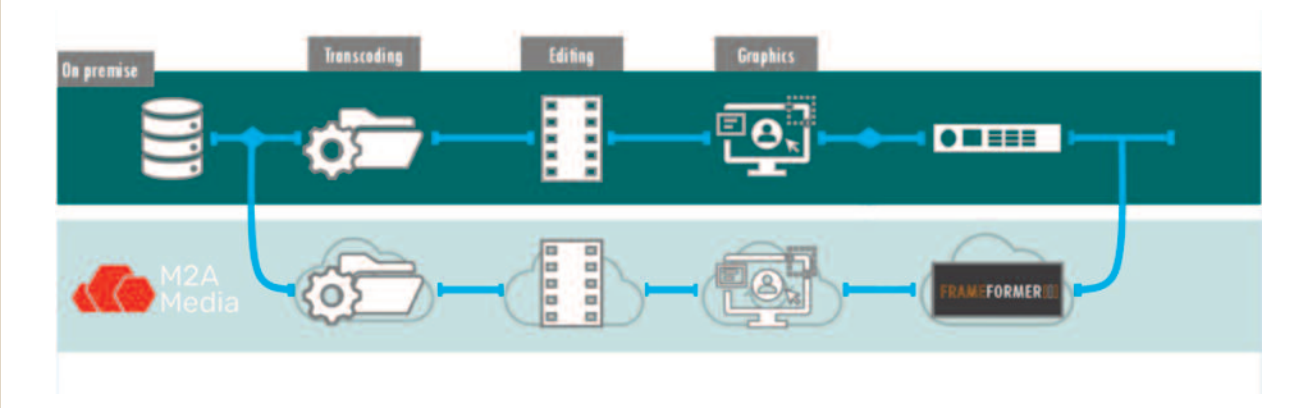
The standards conversion must not add to the latency of the live stream, it has to be easy to deploy in a standard container, and start and stop quickly and cleanly. The service also has to run consistently and have monitoring hooks to ensure reliability and quality of service.

Customer feedback

M2A's customers address global markets so there's been a lot of curiosity about how they can use event-based frame rate conversion in the cloud, on a pay-per-use basis.

In a typical sports production environment, international content is delivered to a local studio, where graphics, commentary and captions are added. The live source then continues its journey through playout where regionalisation, branding, accessibility and break signalling is added onto head ends for transcoding, encryption and packaging before final distribution through CDNs. Increasingly, broadcasters and sports rights holders are taking advantage of cloud-based pay-per-use services to support their operational needs and converging the playout and head end functions. With hundreds of events taking place around the world on a daily basis, there's an ever increasing need for frame rate conversion in the a cloud hosted workflow.

As a leading OTT sports provider, handling over 30,000 live events a year, DAZN was interested to learn more.



The UEFA Women's Champions League matches will be produced in 50Hz since it originates in Europe, but viewers in Japan or USA will need a 59Hz version

Being an early adopter of new technologies, their continuous innovation enables them to stay ahead in live and on-demand streaming, with a focus on delivering the best user experience.

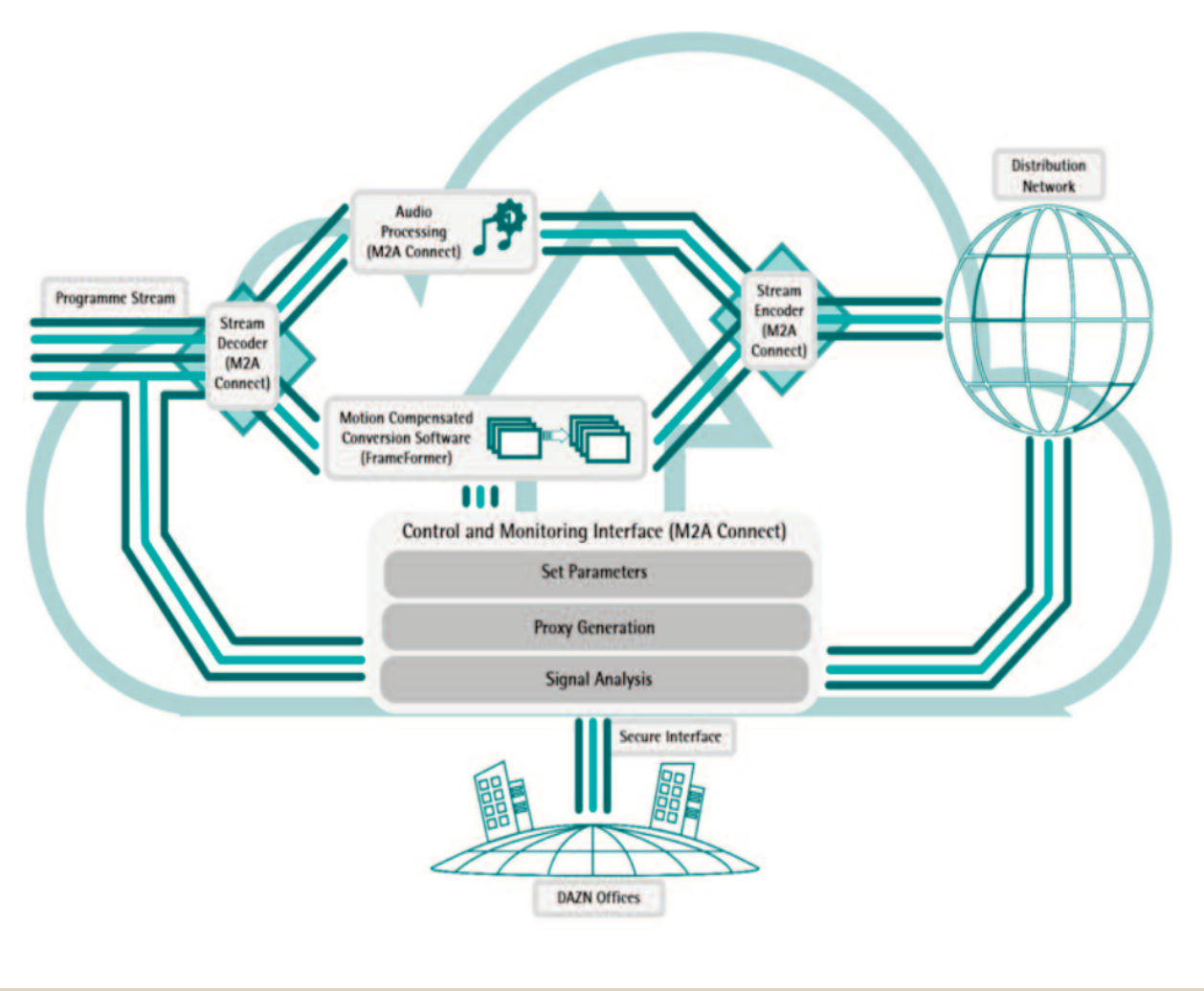
DAZN's channels reach millions of monthly users in multiple languages, so a finished program may be delivered to a single end point, or multiple destinations, where different formats and frame rates may be needed. For example, the UEFA Women's Champions League matches will be produced in 50Hz since it originates in Europe, but viewers in Japan or USA will need a 59Hz version.

With this array of variables in mind, DAZN agreed to evaluate frame rate conversion in the cloud. Since the majority of their workflows are cloud-based, FrameFormer by InSync Technology Ltd was an obvious choice for experimentation with a new workflow.

To exercise FrameFormer's temporal rate conversion, DAZN chose a variety of complex and fast moving content. Conversions between 50Hz and 59Hz were tested, on compressed material. Motion compensated frame rate conversion, such as that provided by FrameFormer, is needed for the highest possible picture quality when sports content is converted. Alternatives such as frame repeat/duplication or linear conversion lead to blurring, judder, and loss of resolution.

Conclusions

Pay-per-use standards conversion in the cloud brings important benefits to OTT broadcasters, especially those with event-driven workflows.



Interra Systems:

3 Reasons Why Automated AI/ML-Based QC is Critical for the Future of Media Content Delivery

Penny Westlake
Director, Europe at Interra Systems

Media content delivery is changing. During the COVID-19 pandemic, OTT video consumption soared to new heights, and that trend will continue into the future. **According to Acumen Research and Consulting**, the global video streaming market is expected to grow at a CAGR of around 12.2% from 2020 to 2027, reaching a market value of over $843.1 billion by 2027.

Viewer expectations are not the only change happening in the video world. Workflow enhancements and technology innovations are transforming the way broadcasters and media companies create, deliver, and inspect the quality of content.

As broadcasters and service providers look to improve content quality and deliver the highest-quality viewing experiences to audiences around the globe, they will increasingly rely on AI and ML technologies, combined with computer vision techniques. Here are three reasons why.

Consumer Tastes are Evolving

Diversity and choice are abundant in the OTT environment. Today, consumers can watch media content on a variety of different screens, including TVs, smartphones, tablets, and PCs. There are also many different services consumers can choose from, including Netflix, Hulu, HBO Max, NBCU Peacock, Disney+, Amazon Prime Video, and more. Having so many options available has set the bar extremely high for quality of viewing experience.

Consumers expect exceptional quality content on every screen. Research firm Sensum found that a viewer's negative emotions increase 16% while engagement decreases nearly 20% as a result of poor-quality streaming experiences. The survey also found that 76% of participants would stop using a service if issues occurred several times. With AI/ML-based quality control (QC) technologies, broadcasters and service providers can ensure that the experience they are delivering is of the highest quality, while also ensuring that processing time is kept to a minimum.

Content Volume is Growing

OTT technology has globalized content delivery. Through an OTT service, broadcasters and service providers can seek out new audiences and expand their reach. This means service providers are preparing video content in a wide range of different languages, which requires them to account for national and regional regulations, dubbing, and captions. Content must also be prepared to support the multitude of devices that exist today. Each device has a different screen size and supports different formats. Since there are so many variations to maintain and a massive amount of content to manage, broadcasters and media companies need more efficient methods for QC. ML/AI-based QC solutions speed up the QC process, allowing broadcasters to achieve higher levels of productivity, greater operational efficiency, and improved accuracy.

Modern Media Content Workflows are Complex

OTT video consumption has skyrocketed, and as a result video creation, preparation, and delivery processes have become much more complex, yet there is still a requirement to make the process as speedy as possible.

Traditionally, broadcasters and media companies relied on visual inspection methods to detect issues with audio and video streams. Now broadcasters and service providers are handling a higher volume of content, with multiple output requirements, and manual methods are too time-consuming and inconsistent. Using automated AI/ML-based QC solutions, broadcasters and media companies can prepare content faster, taking into account the need for multiple encoding formats, resolutions, audio, and captions in

Research firm Sensum found that a viewer's negative emotions increase 16% while engagement decreases nearly 20% as a result of poor-quality streaming experiences

multiple languages, with audio suited for the different fidelities of end devices, and with multiple delivery mechanisms.

Applying AI/ML QC in the Real World

AI/ML used within automated QC processes enables broadcasters and service providers to operate faster and more efficiently, bringing increased consistency and reliability to certain media tasks, such as content quality checks, compliance, classification, content categorization, lip sync checks, and more.

Using a fully comprehensive, automated QC system, broadcasters can rapidly check the quality of myriad video and audio formats, as well as checking the quality of closed captions and subtitles. As broadcasters expand their reach into new countries, AI/ML-based QC solutions will help them to ensure that content complies with all industry and government regulations and address the various OTT and on-demand delivery ecosystem requirements.

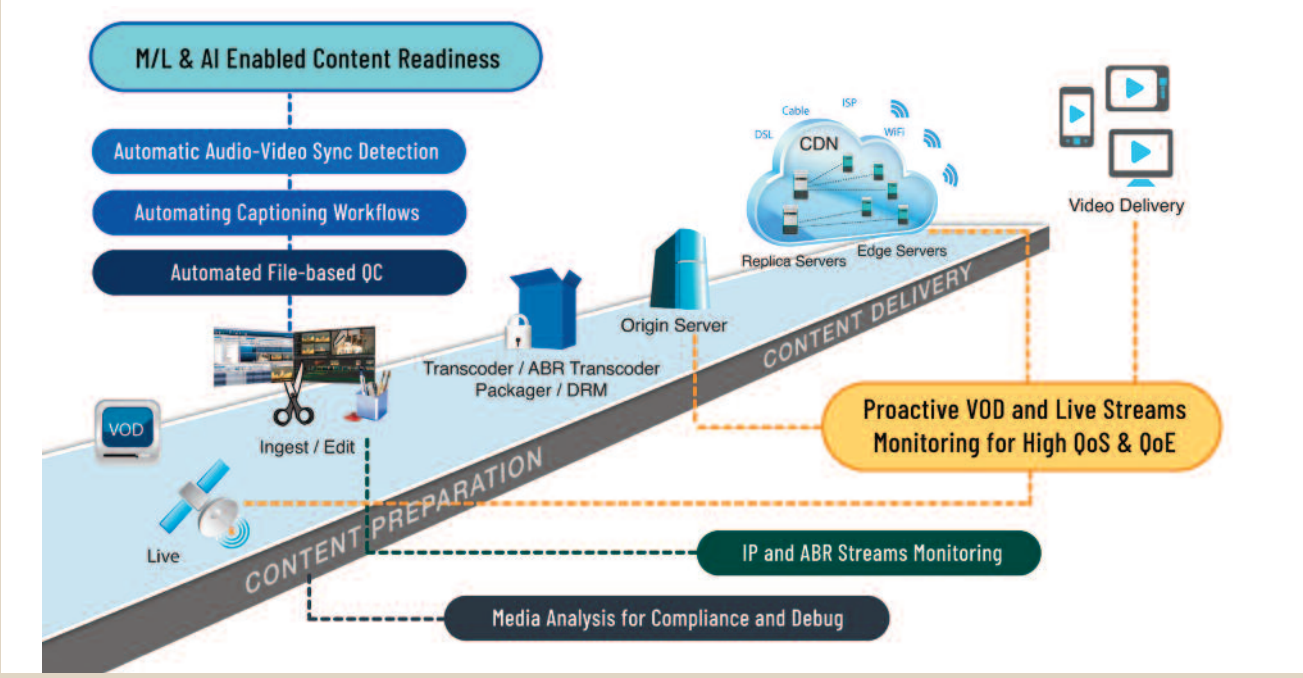
AI/ML technologies are expected to play an increasingly crucial role in enabling broadcasters and media providers to generate metadata for content classification purposes. Content classification is important for VOD and OTT delivery, enabling broadcasters to censor certain types of content, identify celebrities, and detect the presence of brands or objects within content. Previously, this kind of analysis would have required human decision making at every level.

In addition, AL/ML auto QC solutions leveraging image processing, ML technology and deep neural networks can aid in quick, precise identification of lip sync issues and facial recognition, optimizing the quality of experience for viewers. Lip sync issues have long been one of the most noticeable errors that consumers find irritating, and can lead to consumer churn. The latest AI/ML models, designed for broadcaster and media company use, can speed up the identification of such errors across multiple content formats. With automated and AI models for data analytics, broadcasters can gain unique insights into viewing behavior and further enhance QoE.

Finally, good captioning, subtitling, and audio description have become an increasingly key requirement for media content today, and ML is effective at checking for the presence and accuracy of these services.

Conclusion

Given the rapidly evolving broadcast landscape today, changing viewer expectations, and massive volume of content that is distributed to global audiences, it is more important than ever for broadcasters and service providers to deploy auto QC solutions that offer more than basic audio and video checks. Broadcasters need solutions that offer increased efficiency, speed, and accuracy for classifying and categorizing content, performing lip sync checks, and adding captions. Recent innovations in AI and ML technology are paving the path toward higher-quality video experiences.

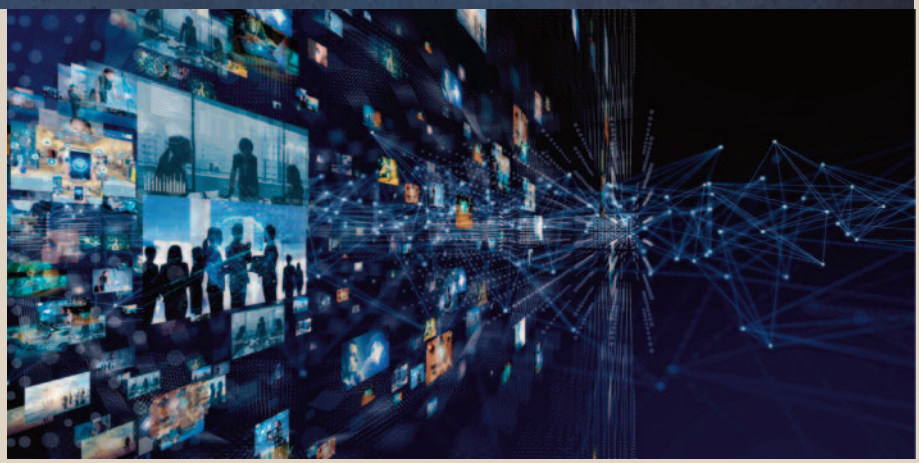


iSIZE:

Taking on the growing challenge of rising content volumes and a spiking carbon footprint

Sergio Grce
CEO, iSIZE

The amount of video content being distributed is only going in one direction – and that is up. Over half the global IP video traffic (56.8%) will be HD and around a quarter (22.3%) will be Ultra HD by 2022 according to Cisco. This demand for high resolution video inevitably requires a trade-off somewhere along the line – either in terms of bandwidth or to the end user experience.



Higher resolution video, which consumers increasingly expect as standard, also typically means higher bitrates, which can result in slow starts, video buffering and high content delivery network (CDN) and storage costs. This is bad news for the viewer and bad news for the content provider.

The continuing surge in online media consumption means our industry faces two pressing challenges. First, there is unprecedented stress on network infrastructures worldwide, which not only creates content delivery bottlenecks, but also affects how content can be distributed efficiently to the ever-growing numbers of viewers. Second, this rapid rise in content consumption and delivery also has a huge impact on the industry's environmental footprint.

In the perennial drive to balance efficiency and capacity, interest in the perceptual optimisation of video – in other words, the processing of digital video streams to deliver the uncompromising quality that users expect without a simultaneous uptick in bandwidth – is rising. Traditionally, the world of digital video has looked to compression technology to address these issues, working to increase the efficiency and sophistication of the codecs it uses – but this brings much higher levels of complexity and is highly processor-intensive.

We are now facing a situation where the increase in video encoding complexity is outpacing Moore's Law. Even with more GPUs and CPUs capacity to encode video content, the sheer volume of content being produced – and watched – means we will very quickly outstrip the compute cycles available. In parallel, the carbon footprint of the internet is estimated to be greater than that of the aviation industry and is something we need to address.

As a company, we believe that the only way we will meet the growing demand for online video, reducing processing, energy, and storage requirements is through disruptive innovation for video streaming. For us this takes the form of new deep perceptual pre- and post-processing, encoding and delivery tools that are device-aware and cross-codec compatible.

We are laser focused on helping customers solve the challenges they face, and we are working – through our own R&D efforts, as well as through projects such as the SEQUOIA R&D project partnership – towards this aim. Deep perceptual optimization of video streams is a key focus for us as a way

The carbon footprint of the internet is estimated to be greater than that of the aviation industry and is something we need to address

of reducing the bandwidth required for equal quality, and iSIZE has built up extensive expertise in this domain.

A unique approach for an urgent challenge

ISize believes that the increasingly urgent challenge of finding trade-offs between the various metrics, between bitrate and perception and between more content and the need to lower the environmental impact – all while managing processing and encoding complexity – requires a unique approach. Instead of relying on more complex codecs and greater GPU/CPU capacity, we believe the more sensible route is to reduce the bandwidth needed for high-quality video streaming. We have directed our patent-pending artificial intelligence (AI) features and machine learning, combined with the latest advances in perceptual quality metrics to this aim. By reducing the bits required for elements of the image that perceptual metrics tell us are not important to human viewers, our technology innovation can deliver perceptual quality that is optimally balanced against encoding bitrate.

If we are to make real headway as an industry, the most effective and efficient approach is to implement a server-side deep perceptual pre-processing enhancement that enhances details of the areas of each frame that affect the perceptual quality score of the content after encoding. In this way, we do not change the encoding, packaging, transport or decoding mechanisms – unlike solutions such as LCEVC. Furthermore, we can be fully compatible with any encoding, streaming and playout device with zero modifications. By using a method that is cross-codec applicable, codec-agnostic, and optimizes legacy encoders like AVC, but also HEVC, AV1 and VVC, we no longer need to know the encoding specifics of each encoder – and so can remove an added layer of complexity.

Most pre-processing solutions use sharpening techniques to deliver perceptual optimisation. iSIZE comes at the problem from a different angle; we maintain the perceptual characteristics of the source and eliminate the need for multi-pass encoding and in-the-loop integration used by many other optimization tools. We have created a single-pass, pre-processing solution that needs no metadata or integration with the subsequent encoding engine(s) and delivers significant gains in quality.

Deep learning for optimized results

iSIZE challenges the accepted norms within the video delivery industry by placing our technology before the encoder. We also ensure that our solution does not depend on a specific codec, and it optimises both for low-level metrics like SSIM (structural similarity index metric), as well as for higher-level (and more perceptually oriented) metrics like VMAF, Apple's AVQT metric or AI-based perceptual quality metrics like LPIPS. In fact, we are able to deliver average bitrate savings – compared to the same encoder and codec – in excess of 20%. On top of this, our technology has been designed in a way that does not break coding standards; this means it can easily be used in existing distribution chains and with existing client devices without causing disruption to customers' workflows.

Thanks to the single-pass approach and agnosticism to coding standards, we are also able to ensure easy deployment on custom hardware or high-performance CPU/GPU clusters.

In a nutshell, we have created a methodology that delivers significant savings in two key areas. First, by reducing the bitrate required from a standard codec to deliver a certain quality level. And second, if bitrate saving is not the only goal, our technology can be used to make the actual encoding much faster – up to 500%, or even faster in the case of VP9, AV1 or VVC encoding.

Leveraging our knowledge and expertise in AI and deep neural networks, we have elegantly answered one of the growing challenges faced by the industry: sustainable distribution of Ultra High Definition content, while limiting the impact of video on internet traffic and reducing distribution costs.

At iSIZE we believe that by proactively reducing energy consumption at all stages within the media value chain, this type of innovation can make a difference to every aspect of media distribution, delivering benefits for the whole sector. With efficiency a key buzzword and environmental ramifications a rising concern, the need to reduce energy consumption and eliminate complexity is front of mind for anyone who delivers content. We are already working with customers to roll our technology out in several vertical sectors, including gaming, social media, and entertainment streaming and will be making announcements in the months ahead.

Jump Data-Driven Video:

How to attract, acquire and retain subscribers to your OTT service

Silvia Werd Elías
Marketing Director,
Jump Data-Driven Video

One of the constant challenges of OTT services is how to attract and acquire new subscribers while holding on to existing subscribers. Thanks to improvements in technology, user behavior can now be better forecasted and anticipated with help of predictive analytics, using advancements in ML and AI.

The world of OTT services is increasingly competitive, as more and more companies adopt OTT to deliver their product. Platforms such as Disney+ and HBO Max have recently taken this step to compete with big names like Netflix, Amazon Prime and Hulu, platforms that have dominated the video-on-demand subscription market for years.

How does one compete in the OTT services market?

There are now greater opportunities to contend with giants like Netflix and Amazon Prime than ever before. To a large extent this phenomenon has been brought on by recent events such as the closure of movie theaters and performance venues or the suspension of sporting events and even concerts, creating a gap in both challenges and opportunities for OTT services.

One of the keys to being successful in OTT services is the ability to deliver engaging and relevant content while fully understanding your audience. For an OTT service to take root, it must be able to accurately predict user behavior, generate personalized content, reduce acquisition costs and increase CLTV or customer lifetime value by 100 %. These are all goals that can be achieved through AI applications and smart data optimization.

At Jump Data Driven Video, our expertise is in the use and management of intelligent data to improve your understanding of your user base. We can provide you with a set of specially-designed data management tools to optimize your OTT service through personalization, increased user engagement, customer retention and acquisition, along with other strategies to shape the key differentiators that will propel you to the next level.

Acquire and retain subscribers to your OTT service

The main success of OTT services is in the ability to offer content that maintains user interest, thereby improving their participation and interaction with the platform, and to increase the number of new subscribers while keeping the churn rate down.

Jump helps you understand more accurately the status of your video

service by giving you a view into the journey your customers take. This will allow you to improve your marketing strategies and offer personalized and relevant content to generate an impact on the specific groups of users you want to target at a specific time with a personalized offer.

What follows are the main performance indicators to quantify and measure the effectiveness of actions and strategies to compete in the OTT services market.

Acquisition

This process is basically focused on meeting customer expectations. In the past, OTT services lived by the rule that it costs five times more to acquire a new customer than to maintain an existing one, but this rule no longer

Jump's prediction system will help you identify which of your potential customers may make a long-term commitment and become a regular customer of the service

holds true because of predictive analytics that determine future behavior through the application of AI and ML.

A fundamental acquisition strategy is to connect with the customer and give it a value in both the present and the future, known as Customer Lifetime Value (CLTV). Video industry OTT services have recently seen a notable increase in the number of new subscriptions, and this trend is expected to continue over the next few years.

According to the Parks association, one of the main factors that drives new subscriptions is to offer content that the customer wants to see, be it a variety of programs or a specific program. Another factor to success is to offer a free trial month. Customers tend to keep a service because they like the content it offers.

Here are some more factors to evaluate in the acquisition phase of the OTT service.

Acquisition of services

Quantifying the number of new subscribers is important, but other factors must also be taken into account, such as the acquisition of services, knowing how and when new customers sign up, as well as the type of service or package subscribed. This will help you forecast your customer's value, revenue, and future plans.

Service discovery

This phase is key to knowing how your subscribers reach your service, to help you determine and implement the most viable channels and methods you should invest in to get more subscribers.

UAP

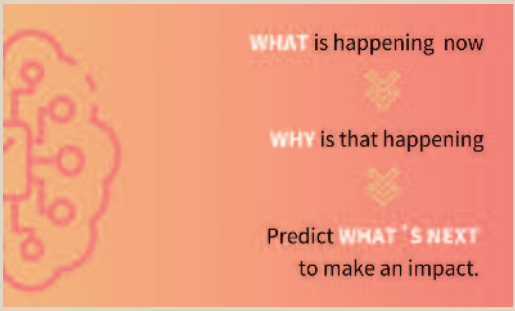
When we talk about UAP, we refer to the performance of the user's attribution, the capacity and amount of subscription that will allow us to determine if the acquisition channels are paying off, and thus implement specific campaigns, managing to personalize the acquisition.

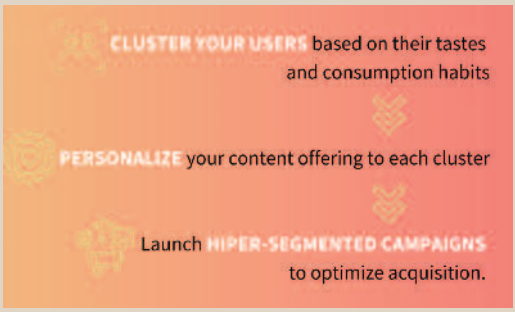
Engagement or commitment

This evaluates new customer behavior and how they may commit to the service for as long as possible. This can only be achieved by enhancing their experience of interaction with the OTT services by offering relevant, personalized content. One way to achieve this is with content recommendations that make it easy to find titles and allow the customer to discover new programs.

Tracking this behavior will help you to predict the customer's future actions and offer an individualized experience. The implementation of AI is really useful in this area because it allows you to segment your users based on their preferences and level of participation, facilitating the creation of groups of users based on the type of content they have in common, and creating specific and personalized campaigns aimed at any target audience.

Jump's prediction system will help you identify which of your potential customers may make a long-term commitment and become a regular customer of the service, and at the same time predict which users are most likely to convert, offering you an effective, solid conversion strategy with immediate and concrete actions.





Retention

There are many reasons why someone may abandon an OTT service. With Jump's strategic prediction system you can better evaluate retention performance indicators and other KPIs that will help you create the strategies to improve retention. Knowing your user makes it easier for you to accurately predict the most likely moment they may decide to leave the service, allowing you to generate a quick response that reverses the situation, which in turn will increase CLTV.

The more committed a user is, the greater the CLTV. This can produce a notable impact on ROI, which is why user retention is one of the main factors of success for OTT services.

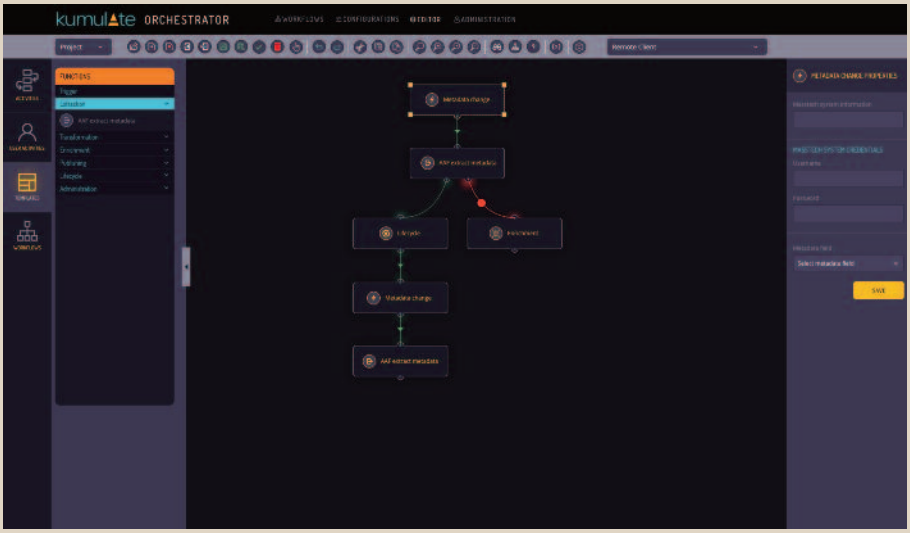
Masstech:
Software defined workflows

What are Software Defined Workflows?
Software defined workflows span the media ecosystem and the wider technology ecosystem allowing assets, systems and processes to be joined and run together. Workflows address repetitive tasks that an organisation runs regularly and can optimise pipelines by allowing content to be processed frequently and quickly.

Building a workflow: coding Vs visual design

There are multiple ways to build workflows. Traditionally, setups have been built through a language such as C#. This is great where a business has developers on hand, though it requires experience and expertise in software development, or a certain scale of team. However, it creates problems in smaller teams and organisations that don't have the resource on hand to create a workflow using coding skills.

More recently, workflow vendors have been working to create visual interfaces that allow workflows to be created in a rather more drag and drop fashion. This involves, for example, dragging an element onto a visual canvas, adding variables or confirmation parameters to that element and connecting it to another element. This enables team members without coding know-how to build out complex workflows which address the needs of the business. This is the route Masstech has taken with our software defined workflow builder within Kumulate, an example of which can be seen here:



Why is language and taxonomy important when designing a workflow orchestration engine?

There are a number of workflow or software defined workflow engines, not only catering to the media and entertainment (M&E) landscape, but also across the wider technology industries. The most successful of these are those that apply clarity and consistency to the language and taxonomy that they use. Consistent use of icons for workflow steps, and the language used as descriptors and categorizations (e.g. Task, Asset, Context, Participant, Infrastructure) – when these are applied consistently within the application, it's much easier for non-coding end users to understand the concepts involved, and makes the construction of the workflows they need a simpler and faster process.

Triggering and orchestrating workflows

Workflows can be triggered within systems such as Kumulate in a number of different ways. Here are a few examples:

- **From the video timeline** – While working with a proxy of a video for example, it's possible to trigger a workflow on the complete asset or a segment of the asset.
- **From within the orchestration engine** – Within the workflow orchestration engine itself

Utilising software defined workflows can allow rapid integration with third party tools and systems, for processing, data exchange or even manual integration

workflows can be triggered to run immediately, set to run on a schedule or when certain conditions are met.

- **From the content manager** – Multiple content items from any storage location can be selected from the Kumulate content management interface, and sent into a particular workflow for processing.
- **From the storage manager** – Specific storage-related workflows (movement, transcode etc) can be performed on all assets stored in a given location, directly form the storage locations module.

On the orchestration side, workflows are run by a server, or set of servers. Workflows are built within a browser by a member of the administration team and are then deployed to one of more orchestration engines within the customers platform; these servers can reside in the cloud or on premise. Individual workflows can then be executed and operated from each of these orchestration engines, allowing the operations to easily scale with the business, and to operate in the most appropriate and efficient virtual or physical environment.

Keeping workflows and their assets secure

As workflows and the assets they process move increasingly into cloud and hybrid-based environments, and require input from multiple partners and vendors, security becomes of paramount importance. Whether securing access to content itself, or simply pointing to a storage location such as a cloud bucket, users need to consider how to securely provide access credentials to the required cloud services, and how the billing for those services will be handled. This is referenced in some detail by MovieLabs in their white paper and video on security for production workflows. [1]

Using software defined workflows to drive organisational pipelines

Software defined workflows' main function is to enable the user to create repeatable pipelines of activity. Whether fully automated, or a combination of automated and manual steps, these pipelines are designed to drive content of a variety of forms, (in our examples video media), through a series of predefined stages. In much the same way that a factory would process content on a production line, software defined workflows create a digital production line for processing content.

The pipelines allow you to consistently and repeatably process content for many purposes, such as transcode and delivery, content enrichment or storage management. Let's look at some examples where workflow automation can assist your business in replacing manual steps that team members may have to take today.

- **Multi-Platform Delivery**: i.e. a transcode to multi transcode formats from a single or multiple source files. With an accelerated delivery.
- **AVID Nexus Storage**: i.e the synchronisation or triggering of content movements based on rules between Nexus storage and other storage volumes.
- **AI Enrichment**: i.e. the enrichment of one or more pieces of content utilising AI services such as Amazon Rekognition or Graymeta Curio.

All of these simple examples could have been performed manually by a member of a team. However, these workflows and their associated triggers allow the organisation to consistently perform tasks automatically, with little to no human intervention, thereby reducing the time to perform them, eliminating human error, and enabling additional reporting.

Integrating software defined workflows with your other tools

Utilising software defined workflows can allow rapid integration with third party tools and systems, for processing, data exchange or even manual integration. Here at Masstech we have many template workflows created, with many integrations, such as:

- **Amazon Rekognition**: automated content analysis for recognition of people, objects, locations, non-compliant content etc
- **Tape and disk storage migration**: automated, rapid migration of content, e.g. from on-premise to cloud, as an automated background operation that doesn't disrupt daily operations.

And, of course, there are many others as part of Kumulate's software defined workflow toolset which allow you to integrate with a range of cloud and on-premise services, including any of your own in-house systems or tooling.

How can Masstech help

Masstech can help you to automate both manual and digital processes. We provide:

- Visual software defined workflow builder with drag and drop interface
- Pre-built template workflows
- Workflow orchestration engine
- Powerful workflow status and reporting
- Professional services as required to support your team

We're happy to help identify challenges and bottlenecks within your business that could potentially be optimised and automated, obligation-free. Our workflow experts can pinpoint where pre-built or customised workflows can address your specific business requirements, as well as provide professional services to assist you and your team however we can.
info@masstech.com
www.masstech.com

References:

[1] MovieLabs - https://movielabs.com/news/new-whitepaper-future-of-security-for-production-workflows/

Spicy Mango: Meaningful metadata – the international standard

Chris Wood
CTO, Spicy Mango

In the last 36 months, the way in which machine learning technologies have advanced is incredible. As the world moves to more automated ways of working, I'm going to dive into how media supply chains are shaped, driven and limited by data.

AI and ML are always billed as the saviour. As buzzwords on an array of the latest product datasheets, occasionally there is a reason to see why. The ability we now have to analyse video, whether this be clips or entire programmes, and generate meaningful metadata is second to none. From a short clip of some relatively mundane motoring content, we can identify people, places, and objects and not just at a high level. An implementation we've looked at recently can not only extract the colour, year and model of a Ford motorcar, but also tell us that there's a wheel, a headlamp, a mirror. Additionally – the metadata produced can be timed – so we now have a system that can tell us not only that there's a car in the video, but at what point in time the car arrives in the scene.

Moving forward, what do we do with this information? Can we make search more insightful for our users? What about counting occurrences of objects to influence recommendations? Linking to parts catalogues or online stores? How about generating caption details on screen or content categorisation and tagging? All incredibly valid use cases we couldn't have dreamt of five years ago. Great benefits to the end consumer, but what about the precursor – and making this content available in the first place?

When media supply chains are built, they rely on a few elements: primarily, essences of video and audio, and a metadata payload to be able to identify them. Through AI/ML, our ability to generate and augment that metadata to include more useful information about the contents of the video is hugely useful. Downstream systems can make decisions in real time during ingest and processing around what to do with that asset such as where it goes in the catalogue, how to categorise it into the correct price point or tier and so on. In the case of sports content, identification of a goal can generate a clip from a highlights programme – or even

Supply chains are now more complex than ever. Every organisation moving content and metadata operates with its own standard

the reverse, and automatically publish this to your OTT platform of choice.

On the technical front, our ability to analyse a piece of content and understand its makeup have been with us a while longer. Generation of a file size, length, codec, resolution, aspect ratio data are all known entities now. The smarts here relate to the way in which we use this information to drive downstream decision making. In OTT, we commonly leverage this data to make meaningful transcode choices, formatting for the correct devices and platforms.

The modern supply chain

Having explored what these innovations mean for the consumer, how do we start to think about what they look like for the industry as a whole?

In order to make this useful we need to understand what supply chains look like in today's world (if you'd have asked me this question 15 years ago – you'd get a very different answer). The major brands we love and know are content businesses. Sure, they build and own technology and products, but fundamentally what is being delivered to the consumer is content. It's the 'product' we're all buying.

The notion that content starts and ends life within the same four walls doesn't apply anymore. In fact rarely is it even the same organisation! Assets are now transferred around the globe between content producers and service providers on a many to many basis. Our world is pillared by licence deals and syndication agreements, so the need to move assets in a supply chain is no longer as limited as it was when television had four channels and everything was taken care of under one roof.

Supply chains are now more complex than ever. Every organisation moving content and metadata operates with its own standard. Many of these standards are driven by either what is required to support processing or driven by years of platform development and integration with a variety of tools and systems. Change is often slow, and it's very hard to adjust a system and workflow that hasn't been designed from the ground up to be modular and support dynamic change without affecting everything around it.

Efforts like the DPP initiative in the UK have worked hard to try to introduce standards and simplify the asset logistic challenges. In looking at the member roster, and having worked with a number of these partners over the years, many are still some way away from a seamless unified approach to logistics – highlighting how complex and fragmented the delivery ecosystem is.

Take this problem and multiply it for every syndication partner that's using a different format and delivery method, rights and license rule variants, and we start to see how big the challenge is with many custom integrations, content and metadata transformations all needed. Despite efforts, no one is singing from the same hymn sheet.

Lastly, there's one other challenge that we haven't yet touched upon. This is the availability of metadata (and I mean good metadata!) from source. Having been in this industry for a long time, I'm still surprised at how many supply chains are driven by Excel, PDF and Word documents; assets arriving via FTP with a basic document (sometimes even forwarded as an email) that incorporates no more than a title, description, series name, season identifier and episode number. Do we have a supply chain? Sure, but it's pillared by large teams of people manually inputting data, often consolidated from disparate third party sources that are yet to be integrated.

AI/ML technologies haven't yet evolved enough to analyse a piece of content and tell us who the director, the producer, or wardrobe assistant was, or even who the file should be syndicated to and when. What are the license rules and distribution parameters?

Despite everything we can do with technology, the ability to create structured data that we can use downstream is still limited if what is received from source is either incomplete or inaccurate.

So what is a data driven supply chain? I'd argue it's the process of using data and information to make decisions on media asset logistics. Does this need AI and ML to get there? Not at all.

There is no doubt that the use of automation and analytics technologies will help a great deal – but there's still a gap to fill that the technology isn't yet able to bridge. To make best use of automation, simplify our content chains and delivery ecosystems, driving home the need for an international standard for high quality metadata at source is still the key.

Symphony MediaAI:

Harnessing technology to leverage the power of data in AVOD

Mark Moeder
CEO ,
Symphony MediaAI

Mark Moeder is the CEO of Symphony MediaAI, a US-based company specialising in revenue optimisation technology for media and entertainment. Symphony MediaAI has been at the forefront of revenue optimisation for over thirty years and has earned a reputation as the most trusted name in the industry. They process data and deliver revenue insights to more than ninety percent of the US media and entertainment market.

Through the implementation of emerging technologies such as artificial intelligence (AI) and machine learning (ML), they are revolutionising revenue workflows and empowering clients with integrated data intelligence on a scale never seen before.

Moeder shared his perspective with IABM on the role of data and technology in maximising revenue for content licensors in the growing AVOD market.

"What's driving interest in AVOD?"

We're seeing continued movement of viewing from a traditional linear setting into the digital space. The majority of US studios now have their own direct-to-consumer (D2C) products, mirroring streamers like Netflix and launching in an increasing number of global markets. And it doesn't end there. Broadcasters too are placing more focus on what they do with their adjacent digital platforms, accelerating (or adopting) a digital-first mindset.

Here in the US there are well over 300 OTT services, but many are finding they cannot survive on the SVOD business model alone. I think it's really telling when you look at the activity of some of the biggest names in the business and how they're all getting involved with AVOD. ViacomCBS's acquisition of Pluto TV has proven to be an astute move and helped them to really establish a firm footing in the AVOD market. Then you have the likes of Fox Corp. buying out Tubi and they're predicting it will return greater ad revenue than their existing broadcast entertainment network in the near future.

These global media organisations all understand the importance of AVOD and adding this additional pillar to their business model. It is critical to capture the share of viewing that is happening below the subscription tier. However, AVOD is still a comparatively immature section of the market and a new revenue model for many. Content owners seeking to track the financial performance of their AVOD strategies often rely on software that can accommodate existing revenue streams and data structures such as SVOD or broadcast, but AVOD is very different.

"What should content providers consider when planning a move into AVOD?"

AVOD is a strong opportunity for content owners to compensate for declining linear revenues, subscription fatigue, and SVOD churn. But in order to retain a competitive edge and maximise income, they must embrace the full applications of big data. Real-time insight is absolutely critical for accurate revenue recognition, tracking and forecasting. It enables adaptation and efficiency as market conditions shift.

However, the sheer volume of data available – not least in its varying degrees of quality and complexity – can prove overwhelming barriers for those who are unprepared.

Take for instance licensing agreements: A typical content owner is managing a master agreement, licensing deals for each title or series, and any number of contractual amendments for every AVOD platform that distributes their content. Add to that complex revenue sharing terms, many of which involve variable rates and data fields that have never been

Here in the US there are well over 300 OTT services, but many are finding they cannot survive on the SVOD business model alone

tracked before like minutes of ads viewed – and then multiply that by the number of titles and distributors you're dealing with. Content owners don't just have to track more data, they have to track an entirely different type of data. Some of it is quantitative, like ad plays; some of it is qualitative, like agreement clause language. It gets extremely complex extremely quickly, and the teams that manage AVOD revenue (e.g. finance, legal, distribution) must quickly mature data operations to keep up.

We still encounter businesses today that are tracking their content distribution activity in spreadsheet applications like Excel. They're having to input information from their contracts, the content that they're providing, the financial returns and performance measure by hand. All of that data is being ingested through an incredibly manual process. They're then relying on a person or a team of individuals to analyse and essentially dictate AVOD strategy when they could instead utilise technology to perform these acts on a much larger scale, providing them with high quality and actionable insights in an instant.

To be clear, licensing teams aren't stuck with outdated systems because they're somehow lagging or resistant to change. Most simply don't know there's any other way. Technological developments in media and entertainment have largely focused on production and ad distribution, overlooking "back office" functions like legal and accounting. Fortunately, that's changing.

What are the main strengths of AI and machine learning?

As the adage goes, "You don't need a weatherman to know which way the wind blows." I think that is a good summation of what people in the Media industry may be thinking when it comes to content distribution and trusting their instincts. Yes, you can step outside and see what the weather is today, but can you accurately predict if you'll need to take an umbrella with you in two weeks' time? This is where AI and machine learning steps in. You can take all the data that you already have and more accurately predict what's coming.

AI can aggregate all your different sources of data, where there's often little in the way of normalisation across formats and outputs, and really help you to analyse and interpret huge volumes. There are so many different AVOD services out there for distributors to supply with content, but how are you to really tell which are the best opportunities for you? How do you know what content will work best in which environment? Which licensing models offer the best returns? Instead of modelling all of this manually – which can be incredibly time intensive – AI software can automate the entire process and accurately forecast demand. Consider the resources required for a team of even the most senior data scientists to predict ROI for a licensed content library by region, by title, genre, audience segment, replayability, and a myriad of other important data points across multiple platforms with wildly different audiences.

Simply put, AI generates quality of insight for a business that is unrivalled and can really empower their AVOD revenue streams.

AI and machine learning can no doubt help the AVOD platform owners too?

Absolutely. There are so many applications of AI and ML in helping not just content providers, but also the AVOD platform owner.

ML is especially powerful here. You can think of ML as an AI system's ability to teach itself, thereby increasing its value to the organisation over time. That happens two ways: with supervised machine learning, you know what insights you're looking for and train your ML system to answer business questions in an instant. That's incredibly useful for AVOD platform owners that want to understand audience behaviour, for example. Unsupervised ML is where AI really comes into its own, working autonomously in the background and analysing your data to find patterns, anomalies, and answers to questions that you wouldn't have thought to ask. Instead of just telling you who's about to churn, it can detect underlying churn drivers you weren't aware of. It can predict which audience segments will have the highest lifetime value and the highest near term time-spent-viewing. It's exactly the sort of strategic insight AVOD platform owners want to get ahead of their market competitors.

As I said before, the SVOD model doesn't work for everyone. A lot of businesses – particularly in the US and the UK – are adapting to the freemium AVOD model. This offers an additional revenue base for distributors struggling with slow subscriber growth and/or high turnover. (Instead of cancelling a subscription, subscribers now have the option to downgrade to the ad-supported tier.) Just as importantly, it offers a wealth of subscriber insight. AVOD platform owners can leverage

AI insights not only to identify those users who might be ready to step up and upgrade to SVOD again, but also to optimise pricing strategies and help personalise content recommendations to hook people in.

Ultimately, AVOD data doesn't just grow AVOD revenue. With adequate data intelligence, it fuels organizational growth.

AI and Machine Learning sounds complex; how difficult is it to understand as a user?

Symphony MediaAI has been active in the media distribution and optimisation field for over 30 years, and we've seen a lot of positive technological change in that time.

Yes, these are complex technologies on the back end. But companies like ours exist because we recognize the value in making data intelligence accessible to everyday users. We quite literally take AI and ML out of the lab, where our R&D teams are making really interesting breakthroughs, and put it into the hands of business users. That's the rewarding part for us: to see our clients effortlessly implement the world's most advanced data science technology in their daily workflow.

It's very clear to me that data isn't going to become a valuable commodity if end users need an advanced computer science degree or decades of experience as a financial analyst to understand it. That's why we're also committed to optimising the front end. Our product teams have actually spent time in media and entertainment finance roles. They've executed the same workflows our clients execute, reported to the same stakeholders, faced the same challenges. That real-world experience is integral to our product design. Users aren't looking for AI, they're looking for time savings and revenue growth. We're committed to building products that enable users to do their jobs better, without having to master the technologies that sit under the hood. It's an exciting moment to bring that sort of accessibility to market.

Distributors looking to extract real value from AI must likewise consider the needs of those business users. How do we arm both technical and non-technical individuals with the right amount of information that they can understand, learn from and apply in a business setting? Unless this insight is readily available to those who need it and can be acted upon immediately, technology is worthless.

What is next for Symphony MediaAI in the world of revenue recognition?

Data is the oxygen of revenue performance. Content providers must strive to attain the maximum data rights in their content partner agreements, but you need to have a data platform to make sense of it all; a platform that can ingest, learn from, analyse and make predictions based on this data.

Our vertical AI solutions cater to the unique data landscape of the media and entertainment industry. That allows businesses to navigate this complex and fast changing ecosystem, optimise their strategy and sustain their competitive edge.

Looking forward, we're focused on continuously releasing features and products that multiply the value we bring to the teams we support today. We're also evaluating where we can add further value throughout the enterprise. How can customer marketing, data science, and product development teams best leverage the solutions we've developed? What other sectors of the industry can benefit from our technology? Those are the strategic conversations taking place right now, and we look forward to expanding our capabilities as the industry evolves.

About Symphony MediaAI

Symphony MediaAI is the leading provider of revenue optimization solutions in media and entertainment. Its Revedia SaaS platform automates end-to-end licensing revenue management and analysis to maximize workflow efficiency, data analysis, and revenue growth for content owners and rights holders. Having analysed billions of transactions on behalf of industry leaders and emerging innovators for over thirty years, Symphony MediaAI brings a deep operational understanding of content providers' unique revenue and data challenges. Learn more at www.symphonymedia.com

Mark Moeder, Chief Executive Officer at Symphony MediaAI, is a growth and transformational oriented executive with an extensive knowledge of general technology and the media space. Carrying 20 years of industry experience in the media industry; centering around technology, revenue management, and optimization. Mark joins SymphonyMediaAI from 10 years at WideOrbit Inc, the preeminent ad decisioning and ERP provider for TV/Radio/Cable industries, where he served as chief operating officer. In this capacity, Mark oversaw business operations for WideOrbit's various product verticals, all externally facing initiatives, special projects, and strategies. Prior to WideOrbit, Mark spent seven years at Google. Serving as technical operations manager, Mark managed operations for Google's Broadcast division, specializing in the real-time insertion of advertising on live Radio Broadcast streams. Before pivoting to a technology specialization, Mark spent several years in the media industry proper. Holding positions of Operations Manager, Director of Programming and on-air talent to Radio and Television organizations throughout the Midwest.

A Media Integration Platform should allow users to design at least 70% of the software-defined workflows without knowing how to program

Tedial Media IT: Democratization of Business Improvement

Emilio L. Zapata
founder Tedial

In a recent report "The Evolution of Production Workflows"*, MovieLabs asks "Would it be nice if software-defined workflows could be assembled as interconnecting children's blocks, where integration is as simple as connecting the pieces in the desired configuration?" To make workflows in the Media & Entertainment (M&E) market more flexible, it proposes defining a minimum set of standards and practices for workflow interactions, thus promoting interoperability and minimising the work required to quickly create a custom workflow. In this way, "the creatives decide what must be done and which workflow components are interconnected to them".

In the M&E market there are media processes that can be complex because media files reside in different storage spaces, are in different formats, must be processed with specialised tools and are the fundamental component of application-to-application integration. In addition, there is a need to minimise media file movements between systems, ensuring that it is the applications that go to the media and not the media to the applications.

A software-defined workflow uses a reconfigurable set of tools / applications and processes to facilitate creative tasks by connecting them through collaboration and automation via software. We can easily deduce that the flexibility demanded in the previous question cannot be achieved by classical point-to-point integrations due to their complexity and lack of flexibility, among other risks. Consequently, the integration paradigm has to be changed.

When we analyse the processes that exist within an M&E organisation, we tend to focus on those that stand out in complexity. On the other hand, we neglect the more elementary and less visible processes that tend to be simple, informal and ad-hoc in nature. The graph below shows a rough distribution of processes in an M&E organisation. There is a large majority of simple processes that should be implemented without the need to go to the IT department. In other words, users should be able to design all processes that do not require programming knowledge.

We are transitioning to a broader and more diverse range of software, IP, cloud, and cross-platform technologies for the M&E market. There are more tools than ever for every part of the workflow. More and more software applications are needed and companies have to turn to a greater number of providers. Trying to make everything work and stay connected as software is updated or new tools are added is becoming a tiring task. It is the responsibility of technology suppliers to provide an enhanced ability to create software that generates tangible business results and accelerates fundamental cultural change for companies.

Media Integration Platform

Often people don't know what they want until they see it. When this happens, software projects take too long. Then come the change requests and the problems associated with possible breaches, because too often users include everything they can think of in the technical requirements specification (RFP), assuming that everything is possible.

The question is, how do you get users and the software team to work together in the initial phase of the automation project using software-defined workflows? The best way to start designing a solution is to think of simple processes (prototypes) and start implementing them, then make adjustments to the prototype. A prototype verifies that business ideas work, analyses how to improve the prototype and can define additional functionalities as needed. In this way, ideas can be expressed quickly and it would not

take months for the development team to understand the RFP and transfer the ideas to the application.

A Media Integration Platform represents a new generation of applications that allow the time it takes to develop software projects to be drastically shortened. This is because the platform facilitates communication between users and development teams, creating prototypes that visualise the needs of the business. We are talking about the difference between many months to two or three weeks in the development of a project.

A Media Integration Platform allows sophisticated business processes to be visually composed by dragging and dropping components (applications and user tasks) into the design area (canvas) and then configuring their functionality, speeding up process development.

A Media Integration Platform should allow users to design at least 70% of the software-defined workflows in the graph below without knowing how to program.

A Media Integration Platform is ideal for implementing the development of solutions based on software-defined workflows in the M&E market, because it integrates the different applications and the people involved in each process at the metadata and media file processing level, as well as organising the work of the users.

In fact, a Media Integration Platform allows both the exchange of metadata between applications and the efficient development of workflows for receiving, indexing, archiving, exchanging, transforming, producing and distributing content in multiple formats (codecs, components, segmented) and qualities. Examples are the preparation of content for multiplatform distribution, content localization or the automatic indexing of content using artificial intelligence tools.

Thanks to Media Integration Platform technology, M&E organisations no longer have to start from scratch or wait for IT to build, upgrade or enable the digital transformation of legacy applications. A Media Integration Platform allows both 'technical' and 'business' users to create any type of process, from simple to complex, without writing code. With a Media Integration Platform-based solution, technology development becomes more agile, collaborative, dynamic and responsive to customer needs including:

- Ability to translate business requirements and outcomes into technology solutions.
- Unprecedented flexibility, speed and agility to adapt to changing customer conditions.
- Maximising efficiency and reduces costs, improves profitability and accelerates growth.
- Dramatically reducing delivery times.

Democratise is a strong word; Media Integration Platform technology democratises solution development and accelerates innovation in the M&E market. By combining different skills, 'technical' and 'business' users, they break down functional silos and hierarchies and help drive innovation and business agility. We believe automation should be easy, because everyone deserves to work smarter, not harder. Our mission is to democratise process automation in the M&E market, where innovation and agility are needed and business processes need to be rethought or refined quite frequently.

Market and consumer behaviours are changing faster than ever before. We are at the forefront of this technology transition and perfectly positioned to enable next generation user experiences, creating solutions that leverage the potential of the cloud, maximise interoperability and enable users to define their processes autonomously and create workflows in a flexible and agile manner. Without a doubt, we are getting closer every day to providing a solid and practical answer to the question posed by MovieLabs.

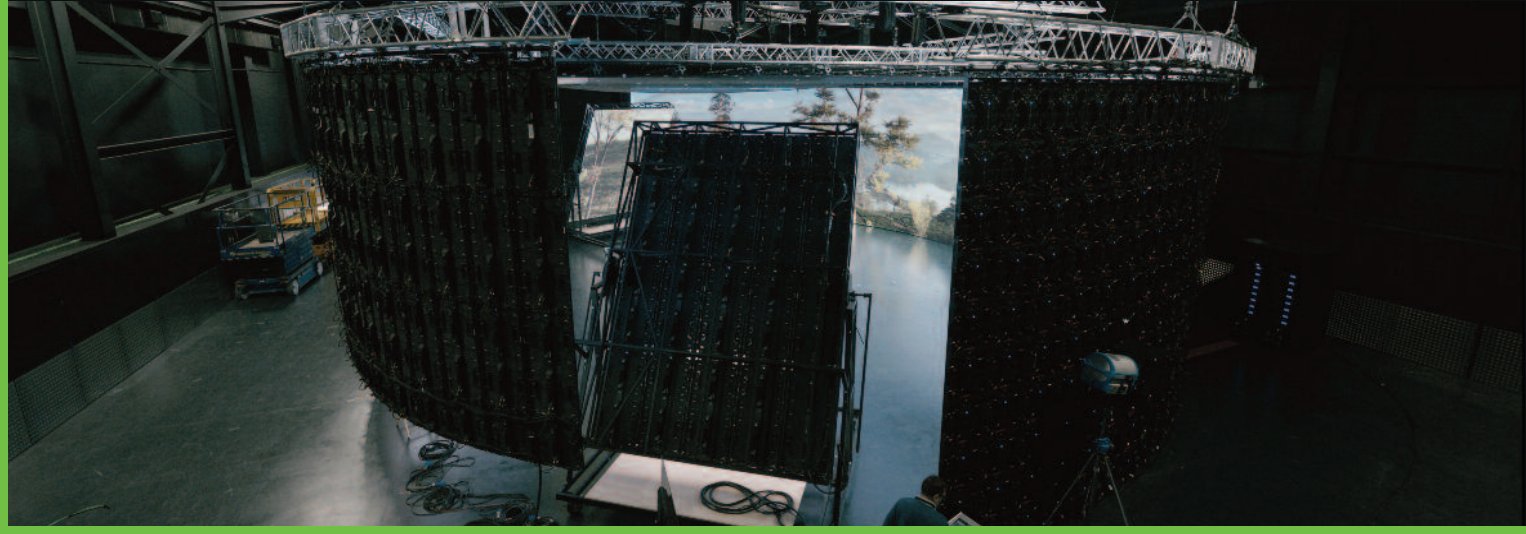
*Reference: White paper "The Evolution of Production Workflows" https://movielabs.com/news/6334/

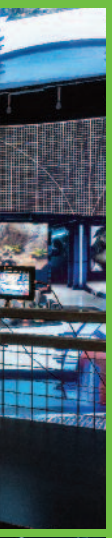
New Member – ROE Visual

LED for Virtual production in film and broadcast applications

Choosing the right product for in-camera VFX starts with choosing the right partner

Virtual set technology has experienced a coming of age for both film, broadcast, and events applications. The last two years have resulted in a steep learning curve for virtual production technology, forever changing the way content is made.






PXO
VIRTUAL PRODUCTION


RENDER 09
NantStudios
VIRTUAL PRODUCTION
RENDER 04
NantStudios
VIRTUAL PRODUCTION
LUX MACHINA
UNREAL


80
SIX

Synchronizing input sources to the camera and playback on-screen is critical to the success of any production using virtual production technology

How to find your way in this new area that so heavily relies on technology?

The use of image output from real-time engines to a live LED wall in combination with camera tracking to produce final-pixel imagery, completely in-camera, represents the state-of-the-art for virtual production, but what application best works for you?

Contrary to what you might think, this starts with looking for the right partner, not the right product.

The right partner will consider your requirements and test the combination of products selected before making the final choice. The use of image output from real-time engines to a live LED wall combined with camera tracking to produce final-pixel imagery, completely in-camera, represents the state-of-the-art for virtual production and asks for considerate testing, syncing, and fine-tuning of the products on set. The best results can only be obtained if the LED screen, LED processor, camera, and media server are meticulously aligned. ROE Visual strives to optimize every aspect of the technology for the creatives behind each project.

ROE Visual won't just give you a box and wish you good luck, their support ranges further. Partnering with all the leading players in the field, including ARRI, disguise, and Epic Games (Unreal Engine), and through combining knowledge, endless testing, and syncing the equipment used, optimal results are achieved. Synchronizing input sources to the camera and playback on-screen is critical to the success of any production using virtual production technology.

"Building an LED panel is not that difficult; building one with the quality and reliability demanded by media and film producers is an order of magnitude more challenging."

Consistency and quality are a hallmark of ROE Visual's LED technology.

Replaced panels need to have the same quality ingrained and must fit with the existing screen setup. ROE Visual supports install and setup with 1-1 training sessions and with technicians on-site as a standard procedure. Issues to be worked through upfront include Pixel Pitch, genlock, refresh rate, and color accuracy. Don't go by the numbers provided by any manufacturer; it's of paramount importance to ask how these are working out in your complete setup and the type of shots you require.

"The production should not have to worry about the quality and reliability of the LED, but just concentrate on creating their vision on set."

ROE Visual has considerable pedigree in both broadcast as well as film applications. As a designer and manufacturer of LED screens for many years, ROE Visual's technology helps rental companies in film and TV production as well as permanent installs at the world's most prestigious studios. Implementing the latest technologies, such as GhostFrame™ and supporting its renowned client base with the best engineering and support. They could be the right choice for you.

Case Study

Case study – Cerberus Tech

Managing the Unpredictability of Live Cricket During the Pandemic transformations

By **Chris Clarke**, *CEO, Cerberus Tech*

Cricket, like many other sports, has been seriously impacted by the social distancing restrictions imposed by the pandemic. The postponement and cancellation of matches at the height of lockdown, through to the more recent challenges of positive Covid tests, all caused a huge amount of disruption.

In May 2021, The England & Wales Cricket Board (ECB) announced a loss of 16.1 million pounds ($22.78 million) for the past year, with revenue dropping while Covid cases rose. Despite the worst-case scenario for the sport being avoided with a full programme of successful international cricket during summer 2020, teams, organisers and broadcasters have endured their fair share of upheaval over the last year and a half.

Predicting the Unpredictable

One of the challenges which goes along with all live sports during the pandemic, is the inability to effectively plan ahead. Alongside the logistics involved when managing short notice changes to matches and subsequent booking alterations, international teams have been subject to a variety of last-minute shifts, which have left content owners and broadcasters scrambling to adjust.

That said, cricket broadcasters are no strangers to some of the uncertainties that regularly accompany live matches. Unlike fixed-duration sports, the length of cricket cannot always be reliably predicted, so the need for some flexibility is to be expected. Unfortunately, this isn't always possible with satellite and fibre delivery. Often broadcasting capacity needs to be overbooked, in order to safeguard against matches running longer than expected.

The Importance of Quick Implementation

The challenges facing international cricket were highlighted recently when our team was tasked with quickly turning around a live delivery request for six separate events from the Sri Lanka vs England Cricket tour.

Our team was approached by the national television network, The Sri Lanka Rūpavāhinī Corporation (SLRC), following referrals from Sri Lanka Telecom (SLT) and Dialog TV (DTV), a direct broadcast satellite pay TV service provider based in Sri Lanka. SLRC's initial request was to pick up and transport a feed from BT Tower and our team advised delivery of a main and backup h.264 encoded linear Zixi feed to the broadcast partner.

By maximising the operational efficiency of IP, sports broadcasters and content owners can transport feeds cost-effectively around the world

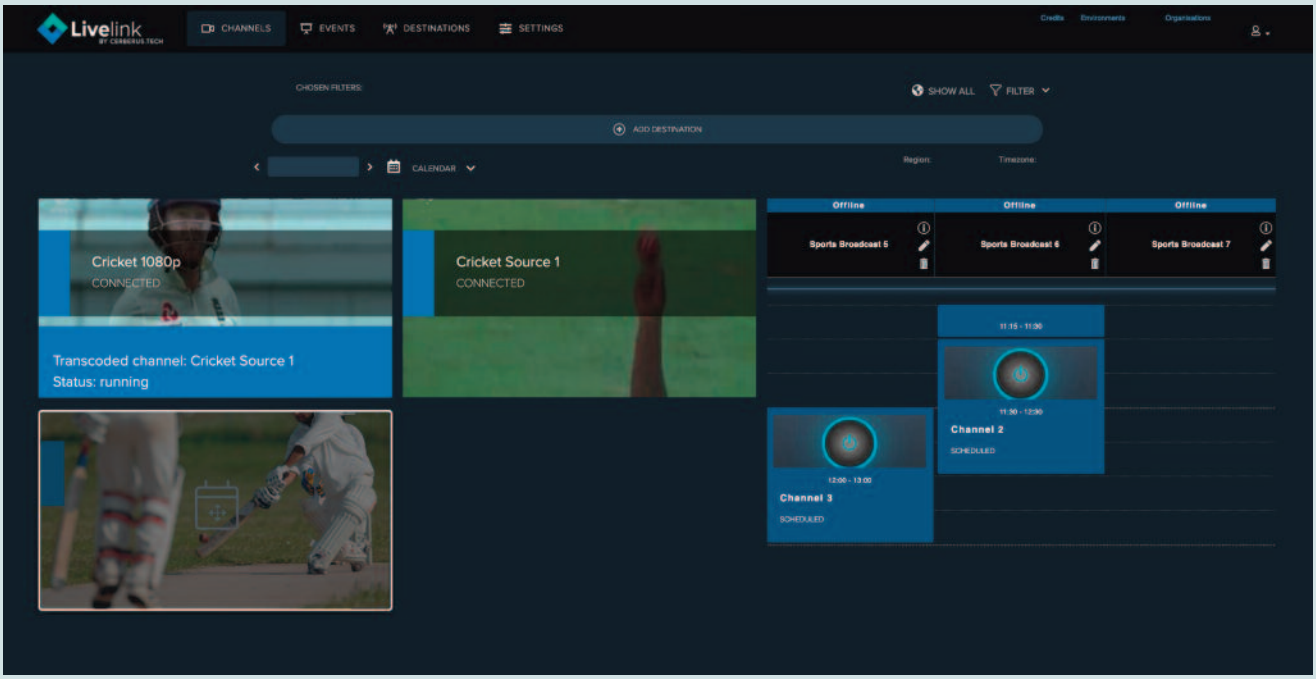
Even though the live event deadline was just three days after our initial conversations with SLRC, we were able to turn things around without any issues. BT Tower pick-up details were provided the day before each match, and the nature of IP delivery meant that the team could remain responsive throughout the entire process. As SLRC is well-established, the necessary hardware set-up was already in place to enable all content to be received in a Zixi format. The Infrastructure as a Service (IaaS) workflow to transport the feeds took less than an hour to deploy and could be connected at the start of each match. By using a protocol agnostic approach to delivery infrastructure, IP engineers can adapt to any broadcast requirement.

Despite working across different time zones, there was no need for our team to be on-site, and the entire deployment was undertaken remotely. Conversations on any adjustments to the infrastructure were straight-forward and the language barrier did not prove to be a challenge. The engineers were able to send a few brief messages to organise and run the set-up, and IP proved to be an international language of its own, which made managing the feeds very simple.

A Scalable Set-up

In total, 40 hours of coverage was delivered, across five days within a 2-week period, featuring a mixture of T20 matches between Sri Lanka and England, as well as some one-day internationals. The initial request was for 36 hours of content, but this was then scaled as the live event progressed and matches over-ran.

By using a cloud-based expand-on-demand environment, we could ensure that SLRC only needed to pay for the infrastructure they required, and this could be adjusted at a moment's notice. A key benefit of delivering live events via IP is that capacity can be allocated at an extremely granular level. In one case, when a match was rained off, we were able to move the IP infrastructure into a stasis mode, so there would be no need for the customer to pay for that coverage. With scheduling changes happening for events all the time, this sort of responsiveness will prove crucial for live sports over the coming months.



Case Study

Looking Ahead

This isn't the first project we've undertaken in Sri Lanka and the team has found the response to IP in the region very encouraging. The cost-effectiveness and technical reliability of IP delivery is extremely appealing for live sports broadcasters, who require a quick turnaround but don't want to compromise on the quality of feeds. We anticipate that there will be an increase in IP adoption, as more live sports events make use of this agile delivery method.

Palitha Gallage, Deputy Director General (Engineering), The Sri Lanka Rūpavāhinī Corporation, commented on the project: "We are very satisfied with both the IP delivery of live feeds and coordination provided. We consider Cerberus Tech a reliable technical service provider and look forward to working with them for such future events."

It is clear that the sports industry is continuing to shift in response to Covid. However, the real question is, where will these changes lead over the long-term? The pandemic has highlighted the restrictive nature of traditional broadcasting infrastructure. Pre-booking physical requirements such as OB trucks or planning for fixed capacity satellite delivery, has proven to be extremely difficult to manage during periods of uncertainty.

Now that next-generation IP solutions have matured within the market, they are poised to tackle the problems facing the sports sector. By maximising the operational efficiency of IP, sports broadcasters and content owners can transport feeds cost-effectively around the world. This allows these organisations to remain responsive for years to come, by changing the way that content is broadcast and future-proofing their delivery infrastructure.

The company is managing an ever-expanding number of platforms hosted on nearly every possible device that can play back video

Case study – Three Media

AMC Networks implements 'many to many' digital transformations

Josh Berger
Three Media

The new content demands that emerged during the pandemic have underlined the validity of the US-based entertainment company's powerful new media supply chain, which was designed by AMC Networks in partnership with leading consultancy Three Media and implemented with a number of best of breed vendors.

David Hunter
Three Media

As the number of viewing options has increased, there has inevitably been a great deal of discussion about consumer habits and the need to ensure that everyone can watch their chosen content in the highest-possible quality. But to date, there hasn't been nearly as much evaluation of the implications these changes are having for entertainment companies and their technology service providers.

All of which made the insight gleaned from a recent **IABM.tv** interview with entertainment company AMC Networks (AMCX:NASDAQ) especially valuable. Available in full on the IABM website (**https://theiabm.org/in-conversation-with-amc-networks/**), the interview sees IABM Head of Membership Engagement Lisa Collins speaking to two key AMCN personnel – EVP Chief Technology Officer David Hunter and Senior Vice President, Media Operations Josh Berger – about the design and delivery of the company's ambitious new 'enterprise-wide media supply chain'.

Observing that the creation of 'great content' is at the core of its business, Hunter says that in AMCN's "global technology operations our goal is to make sure that we deliver that content to our passionate consumers wherever they are." With new platforms and delivery mechanisms emerging all the time, the old '1 to many' distribution model is no longer appropriate, hence "it has been up to us to shift our operations from '1 to many' to a 'many to many' model."

"We were facing rapid growth in non-standard platforms," adds Berger, "and we realised we needed a different approach to the way we service our distribution points and viewers across our ecosystem. It used to be a TV-first business model," but now the company is managing an ever-expanding number of platforms hosted on nearly every possible device that can play back video. "We had no choice but to create a media supply chain factory that encompasses every processing step." This includes rights management, master media acquisition, scheduling, show preparation, and distribution onto platforms so that their subscribers and viewers are enjoying their content on the platform of their choosing.

With the awareness that increased automation would be integral to its new infrastructure, the AMCN team set about an intense period of process and systems review and design in close conjunction with Three Media. Serving as lead consultant for the new AMCN supply chain, Three Media is a long-established advocate of carefully planned and managed digital transformation, working on a wide variety of projects in the broadcast and production sectors.

The result of AMCN's deliberations is a new enterprise-wide media supply chain, informally referred to as Platform ADAM (Advanced Digital Asset Management), developed to make every facet of the content process more efficient, the new infrastructure "fully digitalises our operations and connects across rights and standalone systems, [yielding] a seamless 'comes in once, goes out many' process, from which we have been able to gain tons of efficiencies," says Hunter.

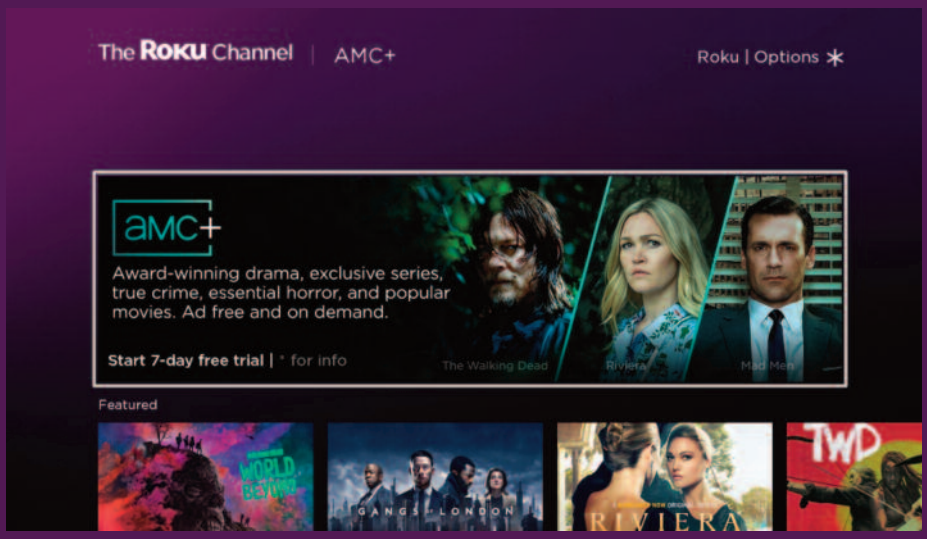
Case Study

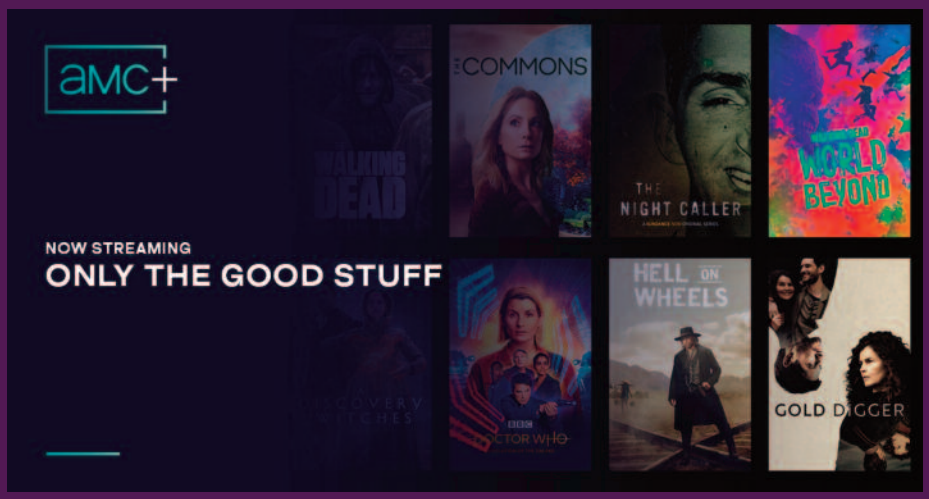
'Data-driven' digitalisation

Acknowledging that the effective use of data is integral to media's digital transformation, the new AMC Networks supply chain foregrounds a data-driven approach. Hunter recalls, "We worked with IBM on a service bus solution to connect all our systems with the data exchange, [meaning we no longer need] humans manually doing that in the digital silos." The new infrastructure also includes best-of-breed solutions from Evertz (distribution playout), Avid (post-production), Xytech Systems (work order maintenance), WideOrbit Program, and Symbox, with the last-named providing "the logic and the conditions we need to orchestrate the sequencing of data workflows across our connected systems, so we do not stumble over ourselves."

The transformation process has also seen AMC Networks collaborate with new and existing service providers to gain intelligence about their post production processes and "really help reduce some of those manual workflows around edit preparation, break points, graphics, and profanity [which are precursors to] getting into edit," says Berger. The AMCN teams embraced this new technology early on, with ADAM becoming a major contributing factor to the company's ability to drive the business forward during the pandemic, "Remote editing has been another success, with everyone 'remoting in' from wherever they are located."

AMC Networks no longer uses legacy production methods. "It's a digital workflow only" confirms Berger. As a result of the overhaul, "we have data feeding our systems [fulfilling our top goal] for the year of becoming a more data-driven company." By connecting media supply chain data with their





Business Intelligence tools, AMCN can begin to collaborate with internal departments such as Research, Strategic Planning, Marketing and Finance in order to support strategic decisions based on a broader set of information and connecting internal supply chain data with external data coming back to AMCN from their distribution landscape.

In keeping with the fast-moving nature of today's media, the new supply chain is also enabling fresh elements of AMCN's offerings as they come to market. For example, the company is currently making waves with its recently introduced streaming service, AMC+, which is designed as an audience-focused package of curated premium content.

"[Platform] ADAM is not finite," confirms Hunter. "It will continue to grow and expand as the company does. We are always looking for innovative ways to get content into the hands of those who want to see it. It's not set in stone and that is something we really like about the new architecture, where the data exchange, workflows and business processes enable content delivery as seamlessly as possible."

Case study – Agama Technologies and Bulb

How Bulb & Agama's innovative solutions support A1 Hrvatska on its digital transformation

Case Study

Over the past few years, customer habits and expectations have changed rapidly, and operators and service providers must now deliver the highest quality content across multiple devices. To achieve customer satisfaction, video service operators and providers must collect huge amounts of user data in real-time.

Then, to fully understand their users' behaviour and the issues that frustrate them the most, they must have the tools and know-how to analyse this data and interpret it.

A1 Hrvatska introducting a 'New form of Life'

When digital services and communications solutions provider, A1 Hrvatska, launched its "New Form of Life" campaign, everyone was puzzled. They kept asking: "What does this mean?" Behind this catchy slogan was an inspiring campaign based on the symbiosis of 'man' and 'technology.'

A1 Hrvatska was quick to recognise the potential of the latest data-analytics technology. It wanted to take advantage of a solution that provides opportunities that seemed futuristic only twenty years ago but can now be rapidly and economically implemented.

It has always followed its customers' needs when it comes to developing its service to fit in with the latest lifestyle changes.

Looking to combine next-generation content with a unique user experience, its focus is on helping

customers to really enjoy the benefits of their digital products and services. To achieve this, A1 Hrvatska assessed thousands of different options to find the best smart solutions that save time and are easy to navigate.

About A1 Hrvatsk A

A1 Hrvatska, part of A1 Telekom Austria Group, employs about 2,000 people and takes care of the digital communication needs of 2 million customers on an everyday basis. It strives to improve its customers' digital experience with innovations and solutions. This led A1 Hrvatska to reinvent its customer service and empower its representatives with a state-of-the-art solution for fast diagnostics and guided troubleshooting.

The Challenge

Determined to reinvent standard customer support processes and transform them into new digital flows for both customers and customer support representatives, A1 Hrvatska had far-ranging requirements.

These included:

- Automation and simplification of standard troubleshooting
- Troubleshooting flow enrichment with real-time metrics for all services
- Empowering agents and end customers through guided flows, from issue diagnosis to resolution
- Integration with existing IT systems
- Flexible customer-care solutions
- Improved customer satisfaction

One of the services that needed to be included in this new troubleshooting plan was DTV (Digital Television). Prior to this project, A1 Hrvatska used a comprehensive Agama solution that helped it monitor network health, including the video head-ends, and assess the individual customer experience.

The solution is broadly deployed on its entire network and is integrated on both IPTV and cable STBs, providing network assurance capabilities and distributed analyzers. A1 Hrvatska wanted to ensure seamless integration of the new project with this existing solution.

The Solution

The goal of the project was to automate customer service to provide agents with automated diagnostics and troubleshooting tools and to empower end-users with an intelligent self-care tool. To accomplish this A1 Hrvatska chose Bulb's Cempresso Customer Care solution.

This is a new-concept software platform that includes an automated background investigation and root-cause analysis, 360 degree service visibility, as well as a unique automatic remedy and guided

A1 Hrvatska, part of A1 Telekom Austria Group, employs about 2,000 people and takes care of the digital communication needs of 2 million customers on an everyday basis

support concept, via various channel interfaces.

One of its key features is that it enables agents to use artificial intelligence (AI)-driven suggestions to resolve issues fast and with a single tool.

As it wraps around existing IT systems and visualises data for customer service agents, it simplifies agents' everyday tasks, making them easier to comprehend. This also makes it easy to deploy and harness the full potential of the Cempresso platform, which was instrumental in the selection of Bulb as a vendor for its implementation.

As already explained, to get real-time insights into the objective customer experience and where issues have occurred, A1 Hrvatska wanted a solution that could easily connect with the Agama API and enable easy access to DTV metrics and statistics. This data is crucial in the everyday troubleshooting process.

What makes this collaboration unique?

By combining these two powerful products, A1 Hrvatska's customer care agents get clear insights into the DTV service. They can identify and solve some issues before the customer is even aware of them and view clear guidance on solving any customers issues that are raised.

Prior to this, they were forced to interpret the data themselves and come up with possible corrective actions that might help.

The Results

- The Cempresso Customer Care dashboard seamlessly connects to existing systems and prepares real-time gathered data for the agents' usage. This simplifies the way agents view the current situation at a customer's premises, as everything is only a click away on a user-friendly dashboard.
- Providing real-time metrics and information regarding the DTV service also makes it easier for customer service agents to understand issues reported by end-users.
- Cempresso Customer Care enables fast issue resolution through a step-by-step guided workflow that uses Agama's on-request gathered KPIs and metrics.
- With seamless integration of Agama and Cempresso, agents can view important data through a single screen, rather than switching between two standalone applications to solve each customer call complaint.
- The agents are able to view statistics for different types of services, such as Live TV, VoD, timeshift, catch-up, and start-over.
- Cempresso interacts with Agama's Analyzers and extracts STB QoE in real-time, when customer service operators open the customer view dashboard.
- This new solution allows simple ad-hoc fixing of customers' issues and, where necessary, the operator can decide whether the customer needs an on-site technician due to installation problems.

Conclusion

Combining the Cempresso Customer Care platform with Agama's client probes, A1 Hrvatska benefits from a solid integration that allows it to collect ad-hoc data sets in order to diagnose customer issues. Furthermore, this solution is powered by two companies that have proven expertise in network analysing and monitoring, and also in providing customer-care solutions.

Most importantly, A1 Hrvatska believes the integration between Bulb's Cempresso Customer Care tool and Agama's solution was one of the key factors to the success of its "New Form of Life" campaign.

" To our great relief and satisfaction, with collaboration and coordination, Agama and Bulb overcame a big obstacle to get the video data to Cempresso thus reducing time for agents for troubleshooting by having all the data in one tool. It was essential to get the right conclusion where the problem is and to empower Customer Support to remedy problems in real-time."

Kristijan Rebelić, Quality Management Team Leader at A1 Hrvatska

Case Study

About Algama

Agama Technologies specialises in empowering video operators' business processes with awareness that can drastically lower operational costs and improve customer satisfaction. With extensive experience and an industry-leading solution for monitoring, assurance and analytics of video service quality and customer experience, Agama helps operators to implement a data-driven way of working to assure optimal service quality, improve operational efficiency and increase customer understanding.

For more information, please visit us at:
www.agama.tv

About Bulb

Bulb Technologies is a software development company that has been supporting digital transformations in large companies for over a decade now. Its software products automate operations departments and transform old ways of working (manual, error-prone, slow, etc.) into new modern digital ones. Today, its clients are some of the leading service providers, including companies in Deutsche Telekom, Telekom Austria, and United Groups. Bulb Technologies provides solutions for telecom service management, customer support process automation, and knowledge management.

For more information, please visit us at:
www.bulbtech.com

"We are very satisfied with the cooperation and professionalism of all participating teams during the integration of video performance monitoring tools. Their focus on delivering the system in the best possible way was inspiring for us. The final product allows our colleagues from other departments to independently and instantly note technical quality of provided video service, which results in positive impact on quality of experience for our customers."

Josip Buzolić, Video Services Development Principal at A1 Hrvatska

To date over 1000 individual localisation orders have been placed through Meta's WarnerMedia localisation platform, including over 20,000 titles, in dozens of different languages. The streamlining of this process has already saved 1000's of working hours

Case Study: Meta and WarnerMedia

Meta and WarnerMedia collaborated closely to create the Meta Localisation Manager – a unique platform turbocharging localisation processes, helping to connect WM content with global audiences.

In 2018 Time Warner and AT&T merged to become the new entertainment giant: WarnerMedia. This merger was the catalyst for significant technological transformation within the newly consolidated group, and the announcement of the HBO Max streaming platform further signalled the intent to position the business as a leader in direct-to-consumer streaming entertainment.

SVP of International Operations for WarnerMedia, James Crossland, recognised an opportunity to replace legacy technology and help maximise the value of WarnerMedia's immense catalogue. A complete overhaul of the International Supply Chain was begun, with best-in-class vendors meticulously reviewed & selected to support the newly defined business and its objectives.

WarnerMedia tasked Meta with housing their title catalogue in 2018, and shortly after, Meta went live with their content metadata platform, which was very well received by internal teams for its intuitiveness and ease of use. The management of content localisation had historically been handled through multiple custom-built internal software solutions, spread across the organisation, so the decision was quickly made to start afresh. With Meta already housing the international title catalogue, the company became the natural candidate to handle the new localisation ordering & management processes.

The challenge of localisation

In most international media organisations, the process of preparing content for global audiences involves dozens of teams across multiple departments communicating with a vast network of localisation studios. Hundreds of people, scattered across multiple time zones, speaking numerous different languages – this is the kind of business ecosystem that is a breeding ground for miscommunication, task duplication and cost inefficiency – and a scenario ripe for an automated cloud-based solution.

Previously, WarnerMedia's Programming and Operations Teams would call or email the Technical Delivery Teams to prepare assets for content localisation. The Technical Delivery Team would then prepare the content in line with technical and editorial requirements specific to the region and deliver it to one of over two hundred localisation studios to prepare subtitles, dubs, translations, graphics and artwork.

Communication between internal teams and the studios was happening via emails, calls and spreadsheets and localised assets were not always returned on time, correctly labelled, or delivered to the right place within the Asset Management System (MAM).

The challenge for Meta, along with Crossland and his teams at WM, was to engineer a platform that would streamline and consolidate the core localisation processes, increasing employee productivity whilst reducing the margin for human error, and all the while keeping a clear audit trail of orders and assets through the international supply chain.

The Solution

The collaboration between WarnerMedia and Meta to find a solution to these problems was comprehensive. The Meta team were embedded into the offices of WarnerMedia for six months to allow the hour by hour, day to day, face to face interactions required to build relationships based on trust and deep understanding. The Meta team

Case Study

"Through our collaboration on the Meta Localisation Platform our teams can now localise content using an intuitive interface and keep track of the assets we use to bring world class entertainment to global audiences, while enjoying a user experience that simply wasn't possible before."

James Crossland
SVP of International Operations

asked each key stakeholder in the localisation value chain three questions; How do you do things today? What are your key challenges? How would you design the perfect solution from scratch? These answers continue to guide Meta's priorities today.

Meta also undertook extensive consultations directly with the localisation studios. The questions asked were; How do you receive orders from WarnerMedia today? How could this be improved? What are the bottlenecks? How would you redesign this process from scratch? These consultations yielded more valuable insights that further informed the technical solution.

As the MAM holds both the source for, and the output from the localisation process, Meta spent a substantial amount of design and development effort on this integration + User Interface. Whilst the technical complexity of data patterns in and out of these systems is substantial, it needed to be presented to users in a clear and understandable way. Now the WarnerMedia Programming Operations team can simply log into the beautifully intuitive Meta user interface and create highly specialised orders detailing all the technical and regional requirements for any piece of content.

The Outcome

The platform leverages Meta's cloud architecture, advanced React design components and API gateway to connect orders from Programming and Operations, through to over 200 external Localisation Studios. The platform then keeps a clear audit trail of all localisations, minimising the risk of asset duplication and reducing the margin for human error. The improvements in efficiency are manifold.

The process begins with the creation of a simple collection of titles from the master WarnerMedia catalogue that are intended for localisation. With the title selection complete, the user chooses the languages that need to be covered under the order – adding the relevant internal stakeholders that provide sign-off for each given language – and the type of localisation required – e.g. dubs, subs, translations, etc. With the key attributes defined, Users can then drill down into incredible detail to configure each language: which studio to use, desired turnaround time, graphics, dubbing and accessibility requirements and more.

At each stage the order is validated, checking the right source assets for each title exist already in the right place in the MAM. Once the order is completed & submitted, a relevant senior stakeholder in the business is notified for approval. All master and compliance edits, alternate audio tracks and subtitles are clearly presented within an easy to access UI so users can quickly see what components are available for a given title and therefore what new localisations need to be ordered. It's now also clear to users exactly what has been ordered and when, giving a clear indication of what dubs and subs in what language can be expected against a title.

On approval, Meta first packages up all the Metadata required for translations and sends this directly to the studio – once the translations are completed and returned they appear in the Meta platform automatically – in a "Proposed" state, awaiting approval and internal sign-off. Meta then creates new placeholders in the MAM for the newly specified subs & dubs, and then triggers the relevant export and delivery process that is pre-defined for each studio. Meta then notifies the technical delivery team of what has been ordered and where to store the new assets when they are returned to the MAM.

Meta enables a clear audit trail of communication between Warner's internal teams and their external partners, eliminates the possibility of task duplication and keeps a centralised record of all global assets. The highly complex process is made elegantly simple for the end user. The clear and intuitive design principles of the Meta UI also reduces the amount of training required for WarnerMedia's Programming and Operations staff. Instead of a new recruit requiring a personal introduction to the technical delivery team and the vast network of localisation studios, a run through guide of how to make an order via Meta is all they require. Furthermore, the avoidance of duplication of work, and the clear visibility of existing subs and dubs, via Meta's content metadata platform, delivers improved efficiency and lower costs.

"We're proud of the localisation platform we have developed with WarnerMedia. It's proof of how it's possible to really comprehend the precise nature of a business issue in another organisation, and work hand-in-glove to co-operate with them to tailor a solution, that is not just bespoke to their needs, but one that will benefit all of our customers."

Rob Tucker
Founder and CPO, Meta

Tech briefing:
RIST and SRT overview: what to choose and why

Vitaly Suturikhin

Over the past decade the media industry has hailed the adoption of the cloud as a way of introducing new efficiencies, as well as improving content protection and business continuity. For many media companies so far, the cloud has been all about storage. But of course, storing content is far from the only thing the media industry does.

New times place new demands in terms of data transfer speeds and delivery reliability, while the amount of content being transferred keeps growing. When tasked with delivering high-definition video via the public internet, network and content providers inevitably encounter the following problems:

- delivery is not guaranteed, and the video on the receiving side may have missing frames, be out of sync, or contain artifacts or frozen frames
- many solutions have a high latency and cannot be used for live event broadcasting
- a desire to be able to use a link of any bandwidth, or even several links
- the content needs to be protected against theft
- the implementation needs to be simple, while the protocol must be compatible with other hardware and software.

Many vendors, content providers, network providers, and broadcasters are at a loss: which protocols should they support and implement in their encoders, players, set-top boxes, and playout systems? Meanwhile, low-latency, guaranteed data delivery protocols such as RIST and SRT have gained a lot of popularity lately. But which of them should you choose?

What do RIST and SRT have in common?

Both protocols are designed for low-latency video delivery via public internet networks. SRT was originally developed by Haivision for use in their own encoders and decoders. It was released as an open real-time video delivery protocol in 2017. Note that Haivision is not only the developer of SRT and the founder of the SRT Alliance but also a member of the RIST Forum which is part of the Video Services Forum. 2017 was also the year when the development of RIST started. Many companies used various RIST implementations in their products, but their solutions were not mutually compatible.

RIST and SRT have the same encryption level and both support high-bitrate streaming and Forward Error Correction (SMPTE 2022-1). Both protocols support pre-shared keys up to 256 bits in length and automatic repeat requests (ARQ), can bypass firewalls, and allow tradeoffs between delivery reliability and latency.

SRT and RIST are present in many popular solutions and frameworks, such as AWS Media Connect, Nimble Streamer, VLC, gstreamer, ffmpeg, and wireshark (via plugins)

Today, both protocols are implemented as open-source libraries, which helps accelerate and simplify the launch of broadcasting as well as avoid dependency on a specific vendor, as opposed to using proprietary solutions like Zixi.

SRT and RIST are present in many popular solutions and frameworks, such as AWS Media Connect, Nimble Streamer, VLC, gstreamer, ffmpeg, and wireshark (via plugins). The librist and libsrt libraries are available for all three major operating systems: Windows, Linux, and MacOS.

What is the difference between the protocols?

SRT was originally developed by a single company based on UDT (UDP-based Data Transfer Protocol), a well-known and proven file transfer protocol. UDT is much faster than TCP and can be easily configured. Unlike files, however, media data are much larger in volume and very susceptible to losses. SRT shows excellent performance at a low or medium packet loss ratio – say, no more than 10% to 12%. The primary aim of SRT was to replace the legacy RTMP protocol that Amazon stopped supporting, while browsers dropped the support of Flash plugins.

RIST was co-developed by a team of experts from different companies specializing in video content delivery (the Video Service Forum and a group of technical representatives from various media companies that would later form the RIST Forum). RIST is based on the RTP, RTCP, and SMPTE-2022 protocols (with IP transport) as well as several other Internet standards (RFC). RIST was originally developed for transferring video content and incorporated much of the experience gained in developing the earlier open and proprietary streaming protocols. RIST can recover up to 55% of sustained and up to 86% of short-term packet losses.

Even old players, transcoders, media servers, or analyzers can work with RIST on the basic level by accepting RTP, however, they do not support SRT.

The approach to authorization is different with the two protocols. SRT uses only pre-shared keys (PSK), which provides an acceptable level of security but does not suit all broadcasters. RIST also uses PSK but can be supplemented with the SRP (Secure Remote Password) protocol for additional protection. In addition, RIST supports DTLS with certificate-based authorization, which is a fundamental requirement of most broadcasters.

For firewall bypass, SRT uses the concept of caller/listener handshaking without permanent rule configuration and also has a special rendezvous mode for that purpose. The principle is based on the connection monitoring function in firewalls. RIST, on the other hand, uses RTCP messages for bypassing firewalls.

The methods for lost packet retransmission also differ between the protocols. SRT is not always suitable for narrow-band internet links because it can congest the link with retransmitted packets in case of a high error rate, whereas RIST has the ability to reduce bandwidth consumption for such retransmission. ARQ is implemented in RIST using NACK only, whereas SRT uses both NACK and ACK to acknowledge receipt.

SRT only supports point-to-point mode, while RIST employs the point-to-multipoint approach, including multilink support and a multicast implementation. In contrast to SRT, which is based on an open-source library with a reference implementation from one specific company, RIST is based on open specifications developed with the participation of a group of companies. The librist project has active volunteers who contribute as testers and technical developers.

Why choose SRT?

With SRT, the lost packets are rebroadcast as soon as possible, meaning a higher content quality and lower latency, unless the bandwidth is limited.

Today, SRT has already gained a certain level of market share and spurred an alliance of developer companies that support this protocol and use it in their solutions. SRT is an open-source project that has attracted a considerable community. Currently, the SRT Alliance has more than 450 member companies, including the recently joined AWS, OBS, and Sony.

SRT also works well for transmitting large volumes of data but suffers a sharp decline in efficiency or becomes totally inefficient at loss ratios of 15% and more, which is confirmed by various research studies.

Being still more common today than RIST, SRT is more effective in terms of compatibility with the potential environment. Unlike RIST, SRT is already present in popular solutions such as OBS Studio and Wowza.

The release of SRT v1.5 was planned for 2020 but has still not happened at the time of writing. In this release, the developers promise to implement bonding, C++11 support, and bi-directional metadata exchange as well as improve bandwidth estimation and multicast support.

I have already discussed SRT in detail in an earlier article.

Why choose RIST?

RIST supports IP multicast broadcasting, which enables considerable traffic and network resource savings. RIST makes it possible to broadcast several streams in parallel (multistream multiplexing), requiring only a single UDP port. Seamless switching without glitching is supported between stream copies transmitted over backup links based on the widely used SMPTE 2022-7 standard. On the receiving side, RIST combines several streams into one common stream (link aggregation/bonding).

Since RIST is based on RTP, the vast majority of devices that accept the RTP protocol can also work with RIST to some extent (except for the ability to handle packet retransmission and other killer features of RIST). RIST has the ability to reduce traffic during packet retransmission to achieve stable broadcasting and eliminate traffic overhead by discarding null packets (padding/stuffing). RIST is optimized for transmitting high-bitrate video via RTP header extension, which allows the range of packet numbering to be expanded from 16 bits to 32 bits. RIST is also deemed to have better security because it supports both PSK (Pre-Shared Key) and DTLS certificate-based encryption which is considered more secure and used by the majority of banks. RIST can recover from losses of up to 25% with 100% overhead and up to 50% loss with 200% overhead. During testing at the Virtual NAB trade show in 2020, RIST was demonstrated to recover from an 86% burst loss with a successful delivery of all the packets (Fig. 1).

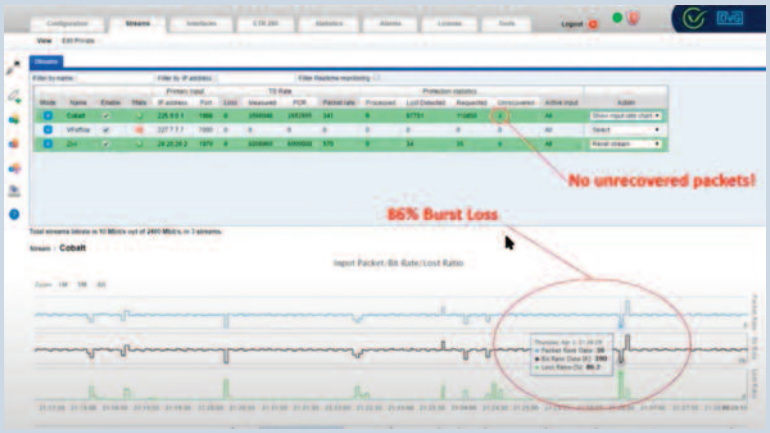


Fig. 1 – Successful recovery of all the packets with a burst loss of 86%

A new Enhanced/Advanced profile is currently in development for the protocol. It can be expected to include improved bandwidth management, adaptive bitrate, lossless compression, optimized management of the created broadcast links, hybrid broadcasting support as implemented in HbbTV and ATSC 3.0, and other things (Fig. 2). The release of the Advanced Profile is already planned for 2021.

Fig. 2 – RIST Roadmap

Conclusion

Compatibility has always played an essential role in the video industry. To achieve compatibility, various standards were conceived and approved that could bring together different vendors under a common infrastructure where proprietary technology always has the potential to become a project bottleneck.

Producing content in a form that is accessible for all partners, customers, network providers, post-production houses, and viewers is a key requirement for any broadcaster. But as time goes by, broadcasters' demands increase, concerning not only compatibility but also in terms of usability, latency, bandwidth minimization while maintaining the ability to broadcast UHD content, broadcasting over lossy public networks, security, authorization, and ease of configuration and management. In response to these demands, new technologies and protocols are emerging, including the two that are being compared in this article. Both protocols are already widely used: at the time of writing, the SRT Alliance has more than 450 member companies while the RIST Forum has more than 130. However, it is anyone's guess as to who will capture the market in the medium- and long-term. Perhaps a time will come when SRT and RIST will be combined into a single protocol, because, despite the differences, they serve a similar purpose and are close to each other in their functional characteristics.

A comparison of SRT and RIST that summarizes all of the above is provided in the table below.

Functionality	SRT v1.4	RIST (Main profile)
UDP-based	Yes (UDT)	Yes (RTP)
Created by	Single company	Group of companies
Point-to-multipoint broadcasting	No	Yes
Lost packet retransmission mechanism	Yes	Yes
Firewall bypass mechanism	Yes	Yes
Support for all codecs	Yes	Yes
Refference implementation (open-source library)	Yes	Yes
Removal of padding/ stuffing (null packets)	No	Yes
Compatibility between different vendors' implementations	Yes	Yes
FEC support	Yes	Yes
Security/Encryption	PSK	DTLS or PSK
Backup	No	Yes (bonding and seamless switching per SMPTE-2022-7)
Authentication	PSK	Certificate-based or TLS-SRT
Upper loss threshhold	12% to 15%	40% to 55%
High-bitrate broadcasting	Yes	Yes
Existing community	Yes	Yes
Compatibility with earlier standards	No	Yes
Connection multiplexing at a single port	Yes	Yes
Bandwidth saving during packet retransmission	No	Yes
Low latency	Yes	Yes
Lo jitter	Yes	Yes
Wide market presence	Yes	Yes
Compatibility with legacy solutions	No	Yes
Native latency measurement function	Yes	Yes
Tunneling (GRE)	No	Yes

Author – Vitaly Suturikhin

Head of Integration and Technical Support Department at Elecard since 2015. Vitaly has over 15 years of experience in information technology. He is in charge for support of the most important Elecard clients such as MTS, Moscow Metro, Innet, ReadyTV. Vitaly was responsible for IPTV and DVB broadcasting at FIFA Confederations Cup 2017 and FIFA World Cup 2018 in St. Petersburg.

Here is the comment from one of the main developers of open source RIST library librist – Gijs Peskens – about what he thinks about RIST and SRT comparison:

"I think the biggest reason why I love the RIST protocol is because it's very simple. I would be able to sit down with someone and be able to explain the core simple profile protocol in less than half an hour, less if they have a good knowledge of video flows and networking I guess. From an operation side of things I think the prime reasons we went with RIST are that simple profile supports multicast (something SRT at the time did not, I'm not sure if it does at this moment), and it being backwards compatible with plain RTP receivers.

"To dive a bit deeper into the protocol, RIST was designed from the get-go as a protocol for video transport, primarily MPEG-TS, and is based on existing technologies used in video transport/networking like RTP and GRE, and uses Adaptive Retry reQuests to signal packet loss to the sender.

"About libRIST, which I help maintain, we just released our first stable release, and are laying the ground work for 0.3 which will feature full duplex communication, certificate based access control and more".

NOVELSAT solutions are versatile and future proof, designed to support and leverage additional software and applications, for expanding system capabilities, both in terms of scale and new functionalities

Member Speak – **NOVELSAT**
Content Connectivity – The Next Generation

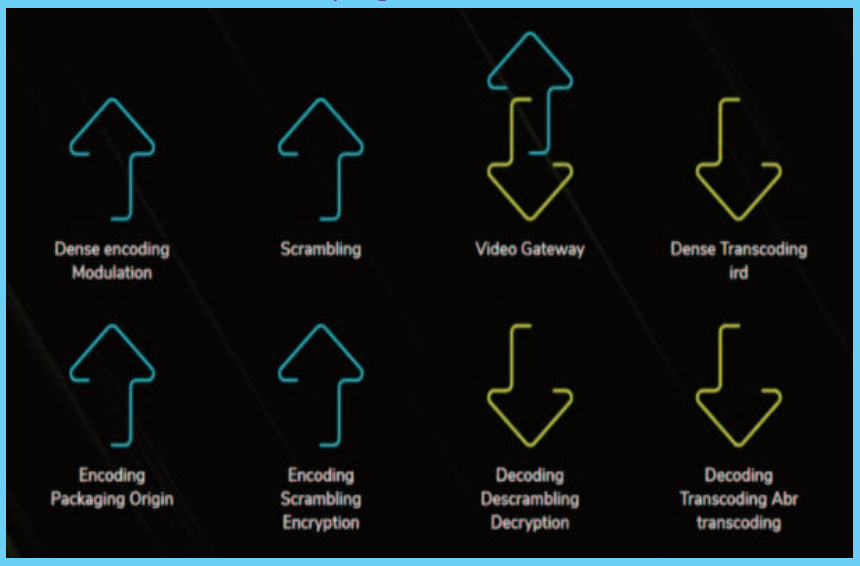
Aviv Ronai
Vice president of marketing & product
NOVELSAT

The broadcast landscape is transforming. The influx of content, the growing audiences, and the rising consumer demands are driving content providers, service operators and media distributors to look for new, innovative ways to transform their infrastructure while optimizing and lowering costs in every single part of the video network.

The need for flexible and efficient delivery networks requires new solutions and agile architectures to meet the new video delivery challenges, NOVELSAT solutions are versatile and future proof, designed to support and leverage additional software and applications, for expanding system capabilities, both in terms of scale and new functionalities.

NOVELSAT innovative solutions answer a wide range of use cases and deployment scenarios which are confronting the above-mentioned challenges. NOVELSAT solutions are assuring the highest levels of availability and flexibility for broadcast and broadband content connectivity. Featuring modular design according to network needs, NOVELSAT solutions allowing multiple configurations, service options and offer best-in-industry content protection, utilizing extensive security algorithms and mechanisms to provide secured media delivery. Guaranteeing very high system and service availability and continuity, NOVELSAT solutions support 1:1 and N:1 interface redundancy with automatic failover.

FUSION – One Platform, Many Capabilities



NOVELSAT empowers content providers, broadcasters, operators, and service providers, by providing them comprehensive tools for acquiring, backhauling, processing, distributing, and delivering high-quality content, over both satellite and IP networks, with unmatched security and reliability.

NOVELSAT FUSION – Unleash Your Content

NOVELSAT FUSION, is a next Generation Broadcast and Delivery solution, primed and ready to handle the fast-evolving world of broadcast media. NOVELSAT FUSION offers end-to-end live linear platform, optimal video processing and security solutions, providing holistic delivery across all digital and linear platforms, including live, time-shifted, on-demand, and OTT (Over-the-Top) streaming.

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- **Ultra-Low Latency** – Employing advanced algorithms to lower the latency across the video processing chain, couples encoding and decoding at both sides of the connection.
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NOVELSAT Xstream – a Multi-Purpose Gateway, is the ideal choice for multiple interfaces satellite networks, requiring any-to-any high-speed connectivity solution.

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About Aviv Ronai

Aviv Ronai is vice president of marketing and product at NOVELSAT, and he is responsible for building NOVELSAT's exceptional vision and brand, as well as formulating the company's technological and strategic directions.
Mr. Ronai is a seasoned telecom executive with extensive leadership experience in Product Management, Marketing, Business Development, Corporate Development & Strategy. Prior to joining NOVELSAT, Mr. Ronai headed marketing and business development at Gilat Satellite Networks. Earlier, he served as head of microwave business development at Broadcom following the acquisition of Provigent where he served as VP Marketing. Mr. Ronai also served as CMO at Ceragon Networks and VP Marketing at ECI Telecom. Mr. Ronai holds an MBA and a B.Sc. degree in Electrical and Electronics Engineering from Tel Aviv University.

About NOVELSAT

NOVELSAT is a leading provider of next-generation content connectivity solutions. Powered by innovative technologies, NOVELSAT broadcast and broadband solutions are transforming networks' capabilities to expand growth potential and to drive new experiences on any device, anytime, anywhere. NOVELSAT high-performance products for satellite and terrestrial content connectivity include integrated video solutions and highly efficient broadband connectivity solutions, as well as best-in-industry content security solutions. Transforming delivery of data and video with new levels of performance, efficiency, agility, and security, NOVELSAT empowers mission-critical and demanding applications for the telecom, enterprise, media, entertainment, government, and mobility markets. For more information visit **www.novelsat.com**

Lyle Keys

We are very sad to report that Lyle Keys, the founder of Utah Scientific and widely liked and respected member of the broadcast community for many years, passed away on July 17th this year at the age of 96.

Lyle was appointed an Honorary Member of IABM in 2007, having been actively involved with the Association for many years.

Below we publish Utah Scientific's tribute to Lyle and follow on with some reminiscences from fellow industry professionals and friends who worked with him during his long and distinguished career. We will add more tributes as they come in.

From Utah Scientific

"The Utah Scientific family is saddened to report that founder, Mr. Lyle O. Keys, passed away July 17, 2021 from complications after a fall. He passed peacefully at his home in Mesquite, Nevada, surrounded by family and friends. He was 96 years old and healthy up until just a few months ago.

"Lyle started his career in the broadcast industry in 1953. He was the founder and president of TeleMation Inc., an early manufacturer of equipment for the broadcast, cable and CCTV industries. He formed Utah Scientific in 1977 and the company continued under his management until 1987 when he reduced his direct involvement and initiated the search for a new president/CEO. In 1991 he ventured into the telecom service business at Teltrust Inc. as chairman of the board.

"Lyle was still active at Utah Scientific and served as our honorary chairman up until 2017. Following his retirement, he still maintained contact with Utah Scientific management nearly every month until his passing. He attended 58 NABs in his career and made exceptional personal contributions to the broadcast technology business. He was an icon in the industry. Lyle was brilliant, funny, and a generous man. He will be missed by all of us at Utah Scientific and many others in the broadcast industry."

From Carmelo Catalano, Chairman at Utah Scientific & CVE

"Lyle was a great man; he was like a father to me, and losing him is very painful. I began working with Lyle in 1980 I am proud to be carrying his legacy forward at Utah Scientific – to continue doing 'the Lyle job'.

Carmelo joined Utah Scientific in 1980. In the early 1990s Utah Scientific was acquired by Dynatech Broadcast Group. In 1997 Carmelo began a process which culminated in him acquiring 100% of the company in 2000 – helped by Lyle – and the name of Utah Scientific, which had been lost following the 1990s acquisition, was re-registered, with the company again becoming an international force in the router and distribution business.

From Derek Owen, also an IABM Honorary Member, who served on the IABM Committee and then Board continuously from 1978.

"Lyle was a very sociable person who loved English pubs and English beer. He told brilliant jokes (none could be used in an obituary). He was a great character and for some time rode a Harley Davidson motorcycle with a pair of BBC studio quality LSU5 loudspeakers mounted on the back as his entertainment. Lyle will be much missed throughout the industry."

From MC Patel, Founder and CEO, Emotion Systems.

Montreux 1987: Tim Gale and I had started Alpha Image in March and we had driven in my RS Turbo to show our D1 routing switcher. We had no stand, but Mike Cox had kindly rented us a shelf on his booth. I had no experience in selling and marketing but that was my designated role, so I had spent the week before contacting US router manufacturers with view to distributing

(Picture caption) - L to R – Rudy Carnesecca, Dave Burland, Tom Harmon, Lyle Keys, Carmelo Catalano, pictured in May 2010 at Lyle's 85th birthday party.

our product. Apart from Pro-Bel, no one had a D1 router as the technology was very new (Sony had shown the D1 recorder a year before and there was little or no infrastructure to support D1). Scott Bosen from Utah Scientific had spoken with us and said that what we had was of interest, but it would have to be approved by their chairman.

The day before the show started, we were setting up and I was tapped on the shoulder by Harry Armstrong (Utah's European Man), "MC, Tim, meet Lyle". The next three hours were a serious interrogation of our technology. My initial fear of revealing too much disappeared because here was a very polite, intelligent and charismatic person who wanted to know everything and spoke with genuine sincerity.

During the show, we had several such "encounters" but, what was becoming clear was, he wanted a product that was a Utah product and not an Alpha product. If it was not for the way he spoke to us, this would have been a very short conversation as we made it clear that we had a product that we wanted Utah to distribute, while Lyle wanted us to design a product to his spec and one that would be branded and owned by Utah (of course we would be paid to design and get royalties).

The wrestling match continued – he sensed my inexperience and carefully managed the conversation and tried to steer it towards his needs. Day 4 of the show, we had a long, boozy, delightful dinner but the pressure was on. Scott (in a private conversation) said that Lyle had spent all the time during the show sketching out what the Utah product would look like.

On the way from the restaurant, Tim and I discussed how to proceed; we desperately wanted to design and sell product under the Alpha brand but here was an opportunity. Alpha was modestly funded by the two of us, and so we agreed that if the Utah design could give us sufficient value, we would do it and that our key talent was design and we could easily design other products.

Lyle Keys

Last day of the show, Lyle came up and said "Well, have you made up your mind?" I said "OK - we will do as you have suggested but..." He cut me short and said " great, I'm travelling after the show and will be in the UK in two weeks and we can sign up then" and he was gone.

Two weeks later, we met for lunch at the Red House in Marsh Benham. He loved beer and he had Fish Chips (very British he said – for many years after this, Lyle, Derek Owen and I used to go for lunch at NAB to a "British Pub for fish and chips and beer"). After we finished eating and were drinking coffee, Lyle said " I've done the British thing and not spoken about our agreement while we had our lunch. So, what's the deal? How do we move forward? ". So, I got to the point (as Tim and I had agreed – a very high price for the design) and gave him my number. There was a minute of silence (felt like a decade) and he said "dollars?". I said " pounds". Another silence. He said: "You need to rethink your numbers". I had not thought of what I would do if my number was not accepted. So, I said "We can design for less but we somehow need to make the number". I paused and he immediately said "OK, make me a proposal". So, I hastily suggested that we charge a fee for R&D and then supply some of the initial product at a steep discount. This way Utah would get a product and we would have some revenue. We agreed and two weeks later, he sent me an agreement (August 14 1987) and we were away.

Product was designed and delivered as per the agreement and we were paid accordingly. NAB 88, the product was launched; he had presold the product to Marcus Obadia of Lime Light and to Andy Delle of the Post Group – two of the leading adopters of D1 technology. At the end of the show, he invited me to spend a few days with him on his boat on Lake Powell. We spent three days there and explored the area. In the evenings, he would make the meanest Martinis and I cooked some makeshift curries. For years afterwards he would joke about the Indian chef he picked up for his boat trip. During this time, I got to know Lyle – he had a long career in the industry and had come up with a range of innovations for router design, control and automation. This was what made Utah so successful. He also spoke about integrity in business (our agreement was proof enough for – it was fair, business focussed and win-win for both companies).

I told him that did feel guilty that I had asked for (in my mind) a large sum of money for the design. He laughed and said "During lunch, you told me you had visited Colin Reynolds of Visions and that he was looking for a router. I visited him next day and sold him a Utah router." He smiled. "And before we spoke to you, he had asked Utah engineering to come up with a cost and timetable for an in house design". The smiled turned into a gentle laugh: "They said two years and $2M. you guys did it in 6 months and for less than a quarter of the price". We both burst into laughter. What Alpha were paid gave us enough cash to last 15 months and allowed us to develop our other products and Utah got a product to market way ahead of their competition. Both of our companies came out better off.

Lyle was a great mentor and a person I could talk to for advice – he would always take my call. This was immensely valuable for the early years of Alpha. Lyle left the industry a few years later but remained Chairman of Utah for a number of years and always attended NAB. Lyle, Derek Owen and I always had our Tuesday lunch every NAB – this went on for over 25 years. Over the last few years, he was not well enough to attend NAB, but he remained involved with Utah Scientific.

I was very fortunate to have a business and personal relationship with Lyle. He taught me a lot about doing business with fairness and integrity and how to look after customers and employees. When he sold Utah to Dynatech (a few years before I met him) everyone in the company had options and made good money out of the sale. I was told his secretary made enough to pay off her mortgage. We don't see people of such character often and I for one will miss him.

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