

It's Showtime!

Innovation explodes across every workflow as technology emerges from the pandemic.



Where are you in this accelerated evolution?

DIVERSITY & INCLUSION

In the office, behind the camera, and on the screen, diversity is crucial

SECURITY

Remote productions create new security concerns, with assets under siege

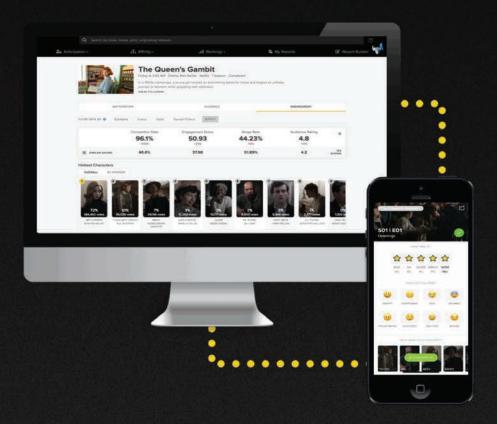
SMART CONTENT

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NEW WORKFLOWS

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IT'S SHOWTIME!

The production advancements born of necessity are here to stay

P. 30 Hollywood's New Remote— and Virtual — Production Reality

MESA members discuss how remote-access workflow and collaboration tools have changed how productions are done, how the cloud is making it all possible, and how securing everything is proving a challenge. A lot of these changes won't be going anywhere post-pandemic.

By Chris Tribbey @ MESA

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From the use of game engine technology to previsualize stunt- and effects-heavy sequences, to the ability of smartphones to scan backstage environments and generate an accurate 1:1 digital representation, COVID-19 kickstarted advances in virtualized production.

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Remote and distributed work is here to stay. Due to cloudsecurity advancements — among other trends — we're witnessing a connected-technology (r)evolution, where the orchestration platform is becoming central to studio and production company workflows.

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Virtual workflows, with internal and client-facing systems accessible anywhere on the planet, enable global expansion. However, companies serving the M&E industry must not lose sight of the importance of direct client interaction with dedicated and knowledgeable staff.

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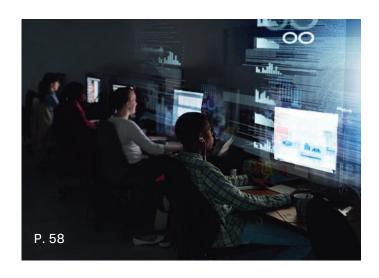
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SECURITY

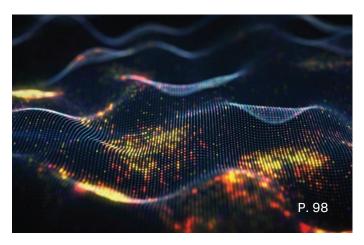
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MESA is a community dedicated to shaping the media and entertainment industry's future. MESA's 150-plus members and content advisors collaborate to advance change management, new workflow solutions, and production/supply chain efficiencies. Launched in 2008 as Media & Entertainment Services Alliance, MESA produces quarterly events (virtual and in-person), daily email newsletters, webinars, and the M&E Journal on behalf of its members. MESA is the management company responsible for the community efforts of MESA Europe, Hollywood IT Society (HITS), Smart Content Council, and Women in Technology: Hollywood (WiTH), as well as the business operations of the Content Delivery & Security Association (CDSA), the Entertainment ID Registry (EIDR) and the WiTH Foundation.

For more information, visit mesaonline.org

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MARRYING OUR CREATIVE AND BUSINESS PRACTICES

By Guy Finley, President, CEO, MESA



Guy Finley is president and CEO of MESA and the Content Delivery & Security Association (CDSA), and CEO of the Trusted Partner Network (TPN). In 2008 he founded MESA as a coalition of service providers to Hollywood studios, independent content holders, video game publishers, software publishers and music labels. guy.finley@ MESAonline.org

Along with many of you, I'm sure, my wife and I have been introducing our kids to the movies we watched growing up. *Raiders of the Lost Ark*, that 1981 phenom, was on the other night. Great movie.

I'm bringing that up because at the end of that movie, right before the Ark was tucked away in a massive warehouse, a government bureaucrat put a piece of paper into a folder. That was the filing process — a piece of paper in a folder.

The next day I came into the office and started to think about how our media and entertainment world has changed over the past 10 years, five years, 18 months. We were once the piece of paper into a folder people. Now we're using lightning-fast technology to share, store, and organize productions from major feature films to digital shorts.

The concept of virtualized production — all the bits around a production that are moving to a platform-like workflow that does not revolve around physical objects — dates back to the Digital Start Package that HITS and MESA helped bring to life the past 10 years, five years, 18 months.

The Digital Start Package is the perfect example of the elements behind Virtualized Production.

How do you track cameras and lights? What about props? Even things like make-up? As soon as we get those items into a platform-like workflow, we can start looking for efficiencies and ways to connect the dots from storyboarding to production to postproduction. Until we move beyond paper in folders, we're like that bureaucrat with a mile of file cabinets.

Our industry's first move into this new world came with emails and spreadsheets. Yet, as we discussed at this year's Smart Content Summit, it's time to move to a platform where we can connect the dots so

WE KNOW THAT PRODUCTION

schedules are kicking back into high gear — now is the time to walk into the next few months with our eyes wide open and look for ways to tie our creative practices to our business practices.

that the folks in the home office have better insight into what the creatives are doing out in the field.

Let's understand — we might be years away from the perfect solution. But it's been phenomenal to watch the brilliant people we have in MESA start moving the blocks towards a better way. We know that production schedules are kicking back into high gear — now is the time to walk into the next few months with our eyes wide open and look for ways to tie our creative practices to our business practices.

The arc of our industry is not that long if we think about it. We've gone from the kernel of silent films to the popcorn of 4D. We've gone through seismic shifts that are not going to end any time soon. The introduction of AI and machine learning will push virtualized production into thrilling uncharted waters.

We can't wait to see the next generation. We're in the new Roaring '20s. Things are moving fast. Let's get into it! ⊞



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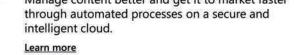
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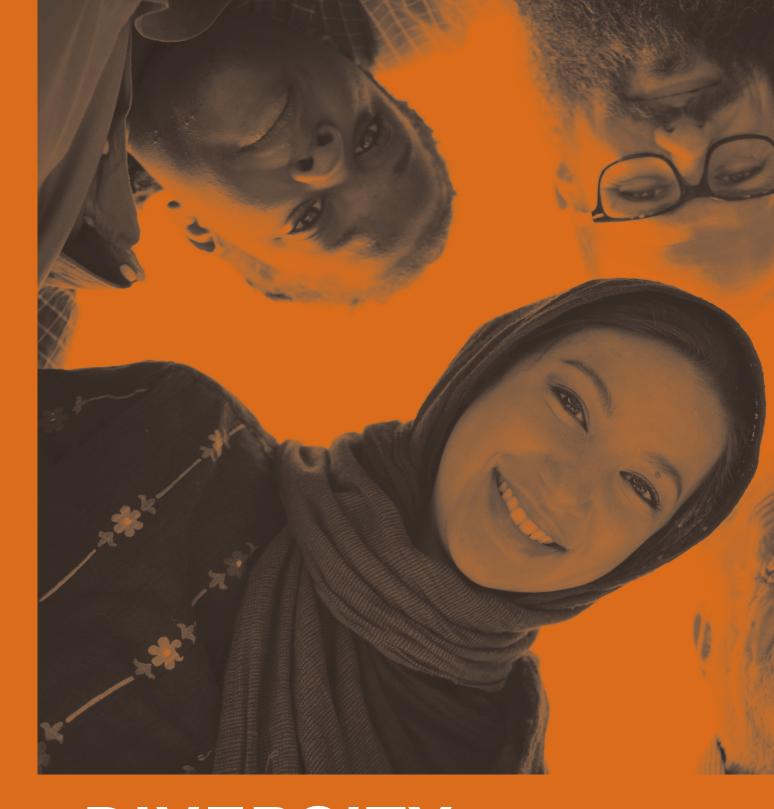


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Creativity in the **Digital Age**

Creativity in the Digital Age, presented by #Microsoft, shares the firsthand perspective and experience of four accomplished media and entertainment industry professionals on their creative origins, what fuels their creative process, the role technology plays in developing and expressing their ideas, and their guidance and inspiration for others on the often-challenging journey of a creative artist.



DIVERSITY & INCLUSION



Media and entertainment is among the more progressive industries when it comes to diversity and inclusion, with ongoing recognition of where we're falling short, and the commitments to adjust accordingly. And while a lot of work remains to be done, consider the advances that have arrived: M&E players are increasingly diversifying workforces, understanding that only benefits their increasingly diverse customers. Technology has emerged that can identify and avoid stereotypes in content. And data-driven decision-making is now the norm, to better cater to the unique makeups of audiences worldwide.

PURSUIT OF DIVERSITY

Equality and inclusion requires we return to our cultural roots

By Devendra Mishra, Chief Strategist, MESA, Founder HITS

The gap between achieving the goal of diversity, equality and inclusion (DEI) and the prevailing reality in society has become wider in recent years, as a blemish in the character of the nation has been exposed and even normalized in terms of white supremacy, racism, homogeny, xenophobia and bigotry.

President Kennedy used affirmative action for the first time in 1964 by instructing federal contractors to take "affirmative action to ensure that applicants are treated equally without regard to race, color, religion, sex, or national origin." Since the creation of his Committee on Equal Employment Opportunity, progress has been made at a snail's pace, although DEI proving to be mutually reinforcing principles within organizations.

Full potential of an organization can only be realized with fair representation of segments of society, namely driven by gender, race and cultures. Our creative and productive leveraging of human resources is maximized by achieving parity between the majority and the minorities. And during the last year of this unprecedented pandemic, we discovered the disproportionate loss of life and income among minorities. The pandemic has reaffirmed that the pursuit of DEI can transform society and benefit every facet of an organization, including the bottom line.

During quarantine, devoid of access to movie theaters for entertainment and working out of home, I explored an answer to "How do we achieve DEI?" I was watching significantly more content where the stories told were from distant parts of the world, such as Iran,

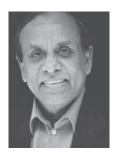
the Netherlands, India, Pakistan and Egypt, to name a few. The content was being streamed from Netflix, Amazon Prime, Hot Star (Disney), YouTube and others. Their diverse cultural content was disproportionately greater than that of the studios and networks.

In order for a story to be told in an authentic manner, it must include appropriate actors, be produced by professionals with understanding and empathy, marketed by relevant experts, and distributed by professionals. Pursuit of our desired goals require that we go beyond hiring practices, we must go back to the roots of the entertainment industry.

From its inception more than a century ago, Holly-wood has been synonymous with storytelling and that equates into producing a unique product of a culture. Stories were told before humans learned to read and write, and have provided entertainment, preserved culture and instilled moral values. People are spontaneously drawn to stories because we see ourselves reflected in them. Hollywood must diversify the stories it tells, and the love, adventure, mystery, myths and history must mirror cultural traits.

The achievement of the desired goals of DEI is constrained by several factors, namely, the potential growth of jobs, inertia of hires made in the past, internal criteria for promotions, and availability of talent. The net job growth of an enterprise depends on the growth of the economy, the degree of productivity improvements realized, and deployment of technology in the production, marketing and distribution of movies and TV

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Devendra Mishra has been the president and COO of companies including LIVE Entertainment, VCL-Carolco, Lieberman Enterprises, Technicolor Worldwide Media and Distribution, and Strawberries Records and Tapes. As president of worldwide new media and distribution services at Technicolor, Mishra strategically developed and launched Technicolor Entertainment Services and also engineered and put into production its first optical media manufacturing facility. As a former adjunct professor of Decision Sciences at Pepperdine University, he is recognized as an eminent thinker and practitioner of supply chain management in entertainment and life sciences. devendra.mishra@MESAonline.org







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USING TECHNOLOGY TO IMPROVE CHARACTER DIVERSITY



ABSTRACT: It's no secret Hollywood has struggled with on-screen diversity and representation. But this issue of appropriate inclusion needs to be addressed among the creatives behind the camera as well. Today, technology exists to identify and measure problematic areas of a script, leading to greater authenticity, avoidance of stereotypes, and helping audiences connect with characters more meaningfully.

By David Ingham, M&E Lead, Cognizant

Diversity and representation in film and TV is a huge topic in Hollywood today.

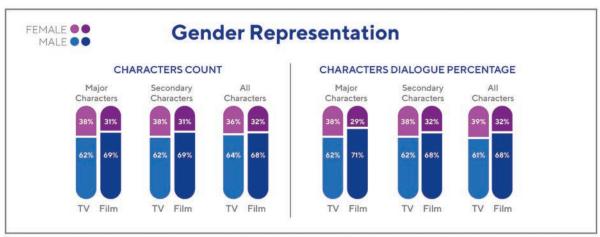
Whether it's white actors voicing black animated characters, or cisgender actors playing transgender characters, we've seen an increased focus on getting casting right this past year. But while advances are being made on-screen to tackle overall representation, progress behind the camera has been slower to occur.

Writers, directors and development executives are still overwhelmingly white and male, meaning there still could be a disconnect between the authenticity of a project on paper, and the actors who are supposed to interpret the

Artificial intelligence and natural language processing is being used to 'read' scripts, and identify where characters lack authenticity

material for the audience. The risk of this is characters may lack an authentic identity because they weren't developed by someone who could identify with the character and their background. In these cases, diverse characters could end up "raceless," or female characters may exist in name only, with all other characteristics exhibiting male traits.

Audiences can sense this lack of authenticity in characters, and ultimately this lack of diversity behind the camera can impact the bottom line of a production. This could be due to viewers not connecting with characters, poor reviews, or, worse, social media and press calling out your characters as stereotypes.



Technologies such as StoryFit can analyze dialogue and offer a dashboard of this information for a scene, script or across multiple scripts in a series.

While the industry continues to transform, there are technologies that have the ability to identify and measure these problematic areas of a script, comparing dialogue and plot elements to expected outcomes or example characters. Artificial intelligence (AI) and natural language processing (NLP) technologies can be used to "read" the script and compare with a wide selection of authentic stories and characters to identify where additional work is needed. This analysis up front by the studio could potentially prevent issues from cropping up later in the project.

StoryFit is one such technology that can rapidly provide this analysis, and below are a few concrete examples of tests that can be run on a screenplay in order to confirm the presence, credibility and authenticity of female characters.

GENDER BALANCE TESTS

A simple initial test of a script is to look at the balance across characters and their associated dialogue. By examining a few key indicators producers can get a quick top-down view to identify areas of concern early. Those indicators include the percentage of female characters (primary and secondary), and percentage of screen time and/or dialogue for female characters (primary and secondary).

The outcome of this analysis could be to identify characters that need to be further developed or introduce new characters in order to balance the cast.

BECHDEL TEST

This test is a measure of female representation in film and has three elements:

- The film has at least two women in it
- The two women talk to each other in at least one scene with all female characters
- The two women talk to each other about something other than a male character

Passing all three of these elements ensures that a script has female characters that exist for more than to advance a male character's arc.

Using StoryFit technology, applied to a real script, we can see how this can easily be automated. The following scene from *Jumanji: Welcome to the Jungle* passes the Bechdel test with this scene below:

INT. BETHANY'S BEDROOM - DAY CUT WIDE to see that the iPhone is at the end of a selfie stick, and the whole operation is being carried out by the girl herself—BETHANY WALKER.

And there is in fact a lot of effort going into this: the curtain has been clamped into place for the light, the sheets are staged, and we get the sense that this is her 10th attempt at this photo.

She scrutinizes it, to herself —

YOUNG BETHANY: Cute, right...?

Understatement. Probably the prettiest girl in school, in fact. She captions the photo — "Just rolled out of bed. Ugh mornings. #nofilter #lovemylife #youdoyou" — then posts it ...

and then immediately seems worried.

Her 11-year old sister Kylie enters —



Based in London, **David Ingham** leads the media and entertainment practice for Cognizant. His work helps broadcasters, studios and other ecosystem players transform their business and operating models through the strategic use of data. Ingham works with innovative startups like StoryFit to identify how technology can apply to real use cases and accelerate change in the industry. david.ingham@Cognizant.com @dsingham

KYLIE: Did you post a pic?

YOUNG BETHANY: Yeah.

KYLIE: How many likes does it have?

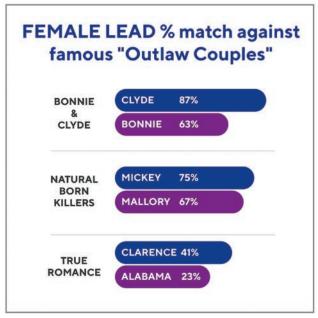
YOUNG BETHANY: What? I don't know. Who cares?

She does, a lot. She glances at her phone, and sees that in the time it's taken to have this conversation, she has —

YOUNG BETHANY (CONT'D): Like, 7 "likes" and ... 3 comments. Whatever. Who cares.

ROLE REVERSAL TEST

Using AI-generated character insights, we can quickly provide a gut check around authentic female characters for development executives. For example, the "Female Lead" graphic featured here, of a lead female character of a new drama series that stars an outlaw couple, displays inconsistencies with the character and females in real life.



A comparison of male vs. female as the 'lead' in outlaw couple films.

| Character | % Dialogue | # Lines Spoken | Most Interacted With |
|------------|------------|-------------------|-------------------------|
| MALE #1 | 25% | 73 | FEMALE LEAD |
| MALE #2 | 24% | 78 | FEMALE LEAD |
| EMALE LEAD | 22% | 83 | MALE #1 |

Often a female lead in a film will still have less dialogue than her male co-stars.

KEY TAKEAWAYS:

- 1. Compared to other outlaw couples, her traits are more similar to the male lead than the female lead of comparable titles. Critics have stated that strong female characters who are simply role reversals of male characters (swapping out female traits for male traits) goes from one extreme to the other without addressing the problem of underdeveloped female characters.
- 2. The female protagonist is brief in her words. She has the greatest number of lines but fewer overall words than the major male characters. This could signify a screenwriter not knowing how to write female dialogue and using male characters to drive plot while giving females more concise, responsive lines.

All of the above analyses can be done by a production assistant reviewing the script line by line. But leveraging AI technology means this can be rendered in a dashboard in minutes, rather than hours or days. That speed can then be translated into faster, more accurate development sessions with the screenwriter and other development executives.

This application of technology is not meant to be a replacement for creativity throughout the filmmaking process, but a decision-support tool for areas that will be scrutinized, regardless of intent.

AI won't solve the diversity and representation issues within the industry, but it can raise awareness of problematic areas within a production, and make sure authentic stories are making their way to a target audience.

The Workforce of the Future

By Shameka Young, VP, Global Head, Diversity, Inclusion, Cognizant

Cognizant is a digital services company with 290,000 associates. That's the size of a major city and even larger than some countries. Now, if you could transform that entire population into inclusive leaders — deeply aware of and empathetic to others, with the courage to speak up and take action when they see inequality — imagine the ripple effect they could have outside of our walls.

That's exactly what we're setting out to do.

When I took the helm of Cognizant's Global Diversity and Inclusion group in the summer of 2020, it was in the midst of a global pandemic that disproportionally affected women and racial minorities, as well as an uprising against racial injustice in the U.S. Amongst the exhaustion most felt, hope shined through communities coming together to recognize the importance of inclusion for all and seeking real change.

Our company took quick action to commit an additional \$5 million to serve communities of color, observe Juneteenth as a holiday, implement flexible work policies to accommodate new working environments, and remind our associates of their roles as allies and changemakers.

Many companies showed up in this critical moment. However, it's essential that our industry not respond to these moments like blips on a radar, putting out a statement, encouraging company focus on D&I for a matter of weeks, then returning to business as usual. This is not a single battle to win: it's a movement that must continually and relentlessly be moved forward.

Embracing D&I is more than the right thing to do, it's also good for business.

Research makes it increasingly clear that companies with more diverse workforces perform better financially. In fact, according to a McKinsey Global Institute study, companies in the top quartile for gender and ethnic diversity are more likely to have financial returns above their national industry medians. This means that to excel in today's global economy, organizations must attract and retain a diverse workforce that sparks new questions, challenges old practices and offers innovative ways to fuel performance.

So, how can companies hit those hiring targets, reach a more diverse audience, and outperform competitors? Here

are a few positive steps that we've taken in the past year, as well as a few areas where we're continuing to make change:

- Our full D&I team is now embedded within HR, because we know meaningful change will only come when the systems and processes that support how we hire, develop and engage our people are aligned to our goals.
- We implemented the Rooney Rule to ensure our interviews represent a more diverse composition of candidates, as well as expanding diverse panels of interviewers. The rule is named after Dan Rooney, the former chairman of the NFL's diversity committee. While it originally applied to hiring practices in football, we've adopted and enhanced the rule to make it relevant to Cognizant's hiring practices as well.
- We are deeply focused on increasing the number of women in our company, including women in leadership roles. We've established female hiring and retention goals for all leaders within our company, which are embedded into annual performance planning.
- We were pleased to become a founding member of the World Economic Forum's Coalition to Tackle Racism in the Workplace, committed to building more equitable and just workplaces.
- We are proud that our 2020 employee engagement survey revealed women and men across Cognizant are equally engaged.

BUILDING A WORKFORCE THAT'S 'COMPLETELY COGNIZANT'

These actions are driven by our D&I strategy, what we call "Completely Cognizant," which serves as a long-term roadmap to creating a culture of belonging. By building a respectful culture in which our associates can thrive, we in turn deliver real results for our clients. That's why "Completely Cognizant" is also oriented around client-centric goals such as:

Continued on page 154



Shameka Young is VP and global head of diversity and inclusion for Cognizant and helps clients to accelerate digital transformation with proven, repeatable innovations. She has more than 20 years of management consulting experience driving financial and operational profitability for global clients. shameka.young@cognizant.com @Cognizant

CYBERSECURITY BENEFITS FROM DIVERSE HIRING

How Edgescan approaches inclusion without HR



ABSTRACT: Sans an HR department, Edgescan has a unique approach to ensuring its staff, in an industry overwhelmingly white and male, is diverse. And if there's any industry that can benefit from a more diverse staff, it's cybersecurity.

By Ciaran Byrne, Head of Platform Operations, Edgescan

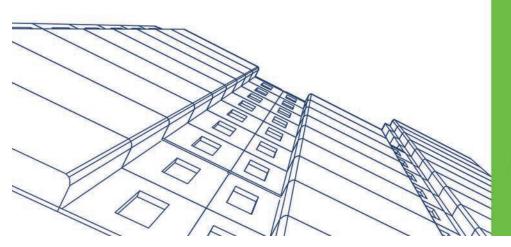
Since its inception, Edgescan has been acutely aware of the underrepresentation of certain demographics in the security industry. It is no secret that this is a sector that is overwhelmingly white and male, and this is a problem not only from an ethical perspective, but something that could actually be damaging to our collective goal of keeping organizations secure.

At Edgescan, we do not have a HR department, so it sits with each department to do its own hiring. A team of four people are consistently involved in the hiring process, and are in charge of ensuring that a new hire is made based on merit and on a person's fit



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with the company's values. This has organically encouraged the diversification of our teams, along with our commitment to further attracting talent that doesn't necessarily fit the average idea of an IT security analyst.

The first phase of the hiring process at Edgescan involves the entire team: everyone is invited to take a look at the pile of curriculum vitaes (CVs) and make a pick — no criteria at this stage: if just one person sees something in someone's previous experience, the person automatically moves to the next stage. There is no preferred college or entry route into a position in our teams; college education is not even a required criterion in our job adverts. Experience has taught us that great security professionals come from all walks of life, and an unconventional background is often an advantage rather than a hindrance.

Previous experience in any industry can be as beneficial as a college education in IT, as long as the candidate can show on their CV that they understand the basics. The rest comes with training: we pride ourselves of providing a solid onboarding process and to invest in the education and professional development of candidates.

The interview process involves two people, who will be picked from the hiring team. We tend to rotate each time, so that there is continuity in the assessment of each candidate. The questions we ask follow a general template, but they won't be exactly the same every time. The technical aspect is consistent so as to give the hiring team an idea of each candidate's competencies and to streamline the comparison of each applicant's performance. We also use a scoring system which is based on a number of headings from "General IT Ability" to "Company Culture," and the interviewers will need to cover each of these during the interview to guarantee fairness

In terms of our efforts to make cybersecurity an accessible profession to everyone, we are proud to encourage and support our employees in their efforts to offer mentoring and guidance to students, whether at university studying computer science or in high school, considering higher education. While the hiring process is important, engaging candidates who might otherwise not see themselves taking on this career path is an important component of widening the pool of candidates.

DIVERSITY IS MISSION CRITICAL

In 2020, Emma Heffernan, one of our security analysts, was involved in the Lost Summer Project, which was created to mitigate the disadvantage of all the internship placements that were lost due to the coronavirus

ULTIMATELY, cyber attackers are endlessly resourceful, and while they only need to be right once, security professionals need to be one step ahead and cannot afford a mistake. To stay ahead, we need to invest in the breadth of points of view, the creativity and the lateral thinking that only a diverse team can provide.

pandemic. This year, James Mullen, security consultant at Edgescan, hosted a guest lecture at Technological University Dublin, which was aimed at presenting cybersecurity as a possible career path to computer science students.

Ultimately, cyber attackers are endlessly resourceful, and while they only need to be right once, security professionals need to be one step ahead and cannot afford a mistake. This means that, to stay ahead, we need to invest in the breadth of points of view, the creativity and the lateral thinking that only a diverse team can provide.

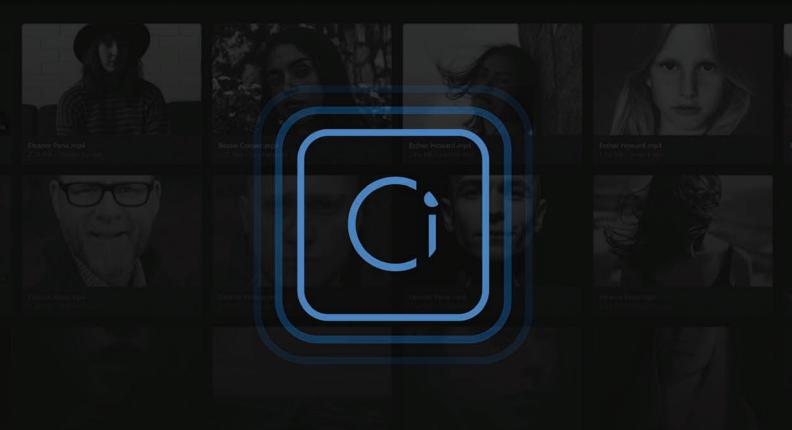
Teams made up of people with similar backgrounds will end up being prone to the same blind spots. Attackers primarily target people (phishing attacks remain the most popular entry point for security compromises), which is why, to protect against these attacks, understanding the people that are being attacked is paramount, and this can only be done effectively if the team protecting the workforce is reflective of the wider workforce.

Diversifying security is not only ethical, but truly mission critical. $\pmb{\boxplus}$



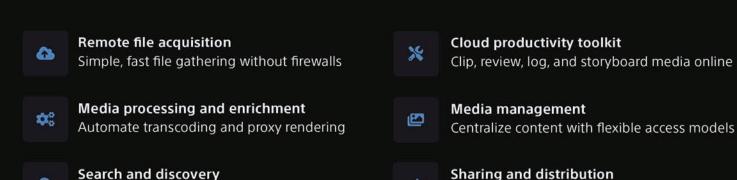
Ciaran Byrne is head of platform operations for Edgescan, leading a team of more than 30 security consultants and analysts of every level. He works closely with development, sales and marketing departments to ensure our product and service is in line with client needs. ciaran.b@bccriskadvisory.com @flipidyflip

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ABSTRACT: With diversity, equality and inclusion efforts continuing to evolve, the cybersecurity industry — similar to media and entertainment — is striving to uncover unconscious biases and recognize where they impact our hiring practices, as well as our employee and client relationships. We outline the process Richey May has followed thus far, sharing useful strategies and tactics that transcend industry.

By Kathy Sealman, Director, Human Resources, Richey May, and John-Thomas Gaietto, Executive Director, Cybersecurity Services, Richey May Technology Solutions

HIMESH Platinum Member

Many companies have begun the hard work of recognizing imbalances in hiring, development, and leadership based on race, gender, disability, sexuality, and numerous other factors. Making lasting change requires diligence and hard work, with some industries having more ground to cover than others. Richey May is no stranger to these challenges, being a firm that operates in financial services, technology and media and entertainment.

Financial services has been perceived as a laggard in diversity, equity and inclusion. At Richey May, we have recognized the importance of fostering diversity across our firm and have been working on our process to design a more inclusive culture.

While we still have work to do, our experience might help others in similar industries to enact meaningful change. Richey May has cultivated an innovative culture that empowers employees to transform our communities with ingenuity and creativity. After recognizing the ways that diversity, equity and inclusion are a challenge for Richey May, a group of passionate individuals formed an internal committee that's become known as Elevate. Elevate has grown to be a group within Richey May, led by a cross-functional team devoted to advancing women, minorities and other under-represented groups at the firm, and in the professional advisory and financial services industries. Through Elevate, Richey May has been able to begin responding to the current needs of our firm, and develop

NOT ONLY DO THESE PROGRAMS HELP train and educate the employees of Richey May, they also help to change the culture and create a sense of community

comprehensive plans for change.

The Elevate team has worked to enable change for the firm by identifying actions that can be taken immediately, and over the long term. Three key areas of opportunity included education and training, hiring and promotions, and employee programs.

EDUCATION AND TRAINING PROGRAMS

To begin changing the culture and educating the firm about the importance of diversity in our industry and our firm, the Elevate team organized experts to come and speak to employees on various topics. The first educational series covered unconscious bias awareness, including topics such as "The Byproduct of Bias," "Strategic Application," and "Sustainable Growth and Accountability."

Through this series, participants were provided with tools to understand the impact of each other's behaviors on effective communication, with a focus on avoiding the problems associated with making assumptions. Participants then explored how bias shows up in performance reviews, in giving feedback, and in our everyday meetings and interactions. The final part of the series helped employees assess their own behaviors and make developmental plans.

The Elevate team also planned events specifically for women, including topics such as "Workplace Allies – Ways that Women Can Champion Each Other at Work," and brought in experts on the topic. Additionally, they have hosted training programs for leadership to help women recognize areas of opportunity and take action to grow in their careers. Elevate is currently pursuing education and training programs for normalizing diversity and making sure people feel confident and comfortable talking about these issues across the firm openly and honestly.

EVALUATIONS, HIRING AND PROMOTIONS

We saw this come to life in our cybersecurity department as they recognized their team was comprised of only men. Initially, this team had an unconscious bias that there were few women entering the field of cybersecurity, as female candidates applying for open positions were rare. However, within our own technology group, Richey May's business intelligence team is nearly an all-women team. After identifying this disparity, the cybersecurity team leveraged Elevate for recommendations on how to recruit and hire more women, people of color, and others from more diverse backgrounds.

We discovered there are many opportunities to recruit people through industry groups like MESA, and opportunities to diversify hiring practices by taking an active role in recruiting candidates from new sources.

ADVOCACY PROGRAM

This program empowers employees to develop cross-departmental relationships with leadership who they may not typically work with. It's much more than a mentoring program, designed to create more opportunities across the firm with an advocacy and allyship component. This creates an environment that allows more employees to have access to roles they may not have otherwise been considered for. And it helps the firm retain top talent throughout their careers.

Not only do these programs help train and educate the employees of Richey May, they also help to change our culture, and create a sense of community. Community is at the core of Richey May's culture, for both its employees and its clients. Our leadership team believes diversity, equity and inclusion will become a more integral part of the culture in the future.

We believe other companies seeking to improve their diversity and equity can look at what we have accomplished as inspiration to begin driving impactful change in their own organizations.

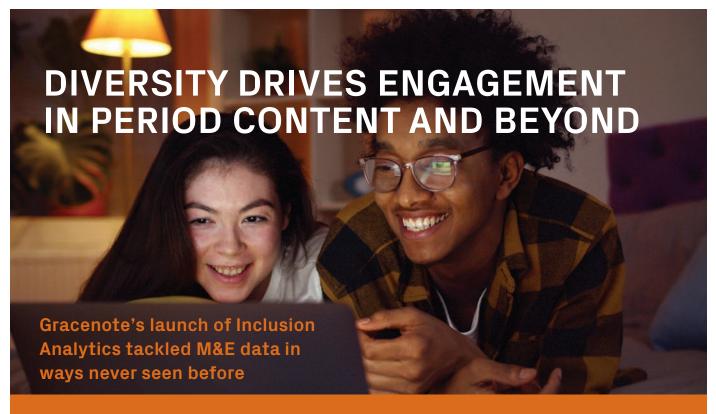
Richey May recognizes there is no destination with an initiative such as this, and we'll continue seeking out ways to foster diversity, equity and inclusion across all categories in our firm, to better serve clients and employees at the highest level. \blacksquare



As the human resources director at Richey May, **Kathy Sealman** works closely with the firm's managing partner to initiate and implement the firm's strategic human resource objectives, policies, and programs. Kathy oversees all aspects of the Human Resource function, including the firm's talent acquisition strategy. <u>kathy@richeymay.com</u> @RicheyMay



John-Thomas Gaietto has more than 22 years of experience providing enterprise information security and risk management services to a variety of organizations, with a particular emphasis on the financial services industry. <u>igaietto@richeymay.com</u> @RicheyMay



ABSTRACT: In order for TV content to meet its full potential to entertain, educate and engage, it must equitably reflect the makeup of audiences and the broader population. Here we cover the current state of diversity in programming and what's possible based on data and insights designed to foster more inclusive content.

By Maryl Widdows, VP, Product, Gracenote, and Charlene Polite Corley, VP, Diversity, Equity, Inclusion, Nielsen

The hardship, stress and pain the global population collectively endured during 2020 is almost unimaginable. The confluence of a global pandemic and a reckoning with deeply ingrained racial, gender and wealth inequality will have long-term impacts that we can only begin to assess now.

Looking back, one thing is clear: audiences stuck at home under COVID-19 shelter-in-place orders sought escape from the events unfolding in the outside world by turning to TV. According to Nielsen's Total Audience Report, U.S. adults 18-plus spent five hours and 21 minutes per day consuming video content. That amounts to nearly a quarter of their day, and a sizable portion of their waking hours ... depending on how much sleep they were actually able to get during this tumultuous time.

When audiences had their fill of the break-neck news cycle, they turned to TV for entertainment, especially streaming. In the U.S., the most-viewed content on subscription VOD (SVOD) services included journeys to the past like "The Crown" and "Hamilton" which were viewed throughout the year. Audiences ostensibly gravitated to these period pieces set in bygone eras to



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NOW AND GOING FORWARD, the need for representation of different identity groups in entertainment content is more critical than ever. Diverse audiences are actively seeking programming that reflects their experiences and exposes them to the realities of others.

transport themselves away from present realities.

One of the most popular programs in 2020 was Netflix's "Bridgerton" which made Nielsen's list of top SVOD programs despite being released just one week before the end of the year. Buzz - and some controversy - resulted from the show's racially diverse reimagination of British Regency era high society. With a 40 percent Black lead cast, Bridgerton reinforced the fact that period pieces could center on diverse narratives, feature racially diverse talent and draw a broad viewing

So how did other period programs featuring diverse on-screen talent fare in terms of viewership? Looking at Gracenote's rich trove of descriptive metadata capturing the moods, themes, settings and other micro-genre details about popular TV programs, we identified period programs set at least 100 years in the past and honed in on those drawing the highest audience ratings.

Of the 23 programs that fit this criteria, four of the top five programs based on Nielsen audience ratings (persons ages 2-plus) had strong representation of lead Black talent in their casts. Strong representation is defined as being on par with the representation of Black people in the U.S. population.

Not only were these the most popular programs among the top period pieces, they were the only period programs in the dataset with lead Black talent at or

above parity with population estimates. Ratings for these top programs significantly outperformed the other programs on the list by a factor ranging from two to ten times higher.

The answer to our question indicates Bridgerton executive producer Shonda Rhimes clearly knows something content creators, distributors and advertisers are just now figuring out: Diversity drives engagement.

These popular programs were embraced by both White and Black viewers, demonstrating the ability of period programs with strong Black representation to attract large and broad audiences. Their resonance debunks the narrative that period programs with strong Black representation isolate audiences instead of expanding them.

When we look at the data we see that audiences are actively seeking diversity on-screen. Content creators and distributors would be well served to respond by developing new stories that shine a light on underrepresented experiences or by bringing underrepresented talent into old stories in new, creative ways.

To help the entertainment industry leverage diversity and inclusion data in order to deliver more resonant video programming, Gracenote launched Inclusion Analytics. The new solution measures the diversity of casts appearing in the most popular programs on

Continued on Page 167



Charlene Polite Corley is VP of diverse insights and partnerships on Nielsen Media's Diversity, Equity & Inclusion team. In this role, she is responsible for developing thought leadership that uses Nielsen data to reveal insights around underrepresented identity groups enabling their needs and value to be more fully understood. <u>charlene.polite@nielsen.com</u> @CharSpeaks1



Maryl Widdows is VP of product for Nielsen Gracenote. She oversees a team which develops advanced content analytics offerings which leverage trusted Nielsen audience measurement data and Gracenote content metadata to answer vexing business questions. She leads the Gracenote Inclusion Analytics product team responsible for delivering new metrics on the diversity of content and audiences to studios, distributors, advertisers and agencies. <u>maryl.widdows@nielsen.com</u> @Gracenotetweets

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THE CHALLENGES OF THE PANDEMIC KICKSTARTED PRODUCTION INNOVATIONS, AND SAW HOLLYWOOD DO WHAT IT DOES BEST:



Content production has always been innovative by nature, adopting absolutely anything that improves the movie or TV viewing experience, the moment technology allows for it. But there's no doubt the COVID-19 pandemic accelerated the advancement of production tools (and removed our hesitancy to adopt them) in ways that may have taken years to accept without the immediate necessities the past year demanded.

EVOLVE.

Remote workflows, a heavier reliance on cloud technologies, the use of artificial intelligence (AI) and machine learning (ML) tools to automate and streamline key production tasks. Accessing creation talent from their living rooms across the world, more cost-effective data storage, using game engine technology to previsualize content, turning to smartphones to scan backstage environments and generate accurate representations for on-screen usage.

M&E stepped up to the challenge. And forever changed how productions are done.

HOLLYWOOD'S NEW REMOTE — AND VIRTUAL — PRODUCTION REALITY

Remote-access workflow and collaboration tools changed how productions are done. And they're not going anywhere post-pandemic.



By Chris Tribbey, Editorial Director, MESA

For director and actor Ramon Fernandez (*Glory Daze: The Life and Times of Michael Alig,* "Sons of Anarchy") the past year was challenging on all fronts, both around the production of a new documentary, and in doing voiceover and acting work.

"Producers now get to save the cost of renting a recording studio and demand that talent themselves invest in software and make a home studio in order to compete," he said of the challenges COVID-19 has presented to voice actors.

But on the production front, Fernandez's pandemic-era direction and editing work on the documentary *See to Sea* — about four blind athletes who crossed the U.S. coast-to-coast on tandem bicycles in just nine days — was a revelation: remote-access workflow and collaboration tools changed how projects are completed.

"We've learned a lot in the last year and much of it is cost-effective," he said. "Many companies will remain as strictly virtual as possible. Not only is it safer, cheaper and less time-consuming, but we've all been trained over the last year on how to do it, because we had to. On-set protocol will probably lax with time, but I think collective paranoia about invisible germs will probably remain to some degree, long after COVID-19."

The pandemic had Mark Harris, director and writer of the recently released comedy film White People Mon-

Art Zuñiga, director of photography for the upcoming documentary See to Sea, shoots overhead in New York City during production of the film in early 2021.

ey, in a different position than Fernandez: his film was already in the can, having wrapped up postproduction just as COVID-19 shut Hollywood down. Harris had to make the same choice many major studios had for their major releases: either sit on the release altogether, or go digital first, and close the window between theatrical and in-home consumption like never before.

"I think the pandemic forced us to make changes, and those changes, especially for independent filmmakers, could be used to our advantage," Harris said. "If a studio film is released on streaming or VOD at the exact same time as an independent film this levels the playing field, because the consumer doesn't have to leave their home to choose between an independent or studio [release]. They can make that decision from their living room."

For both of those filmmakers — and so many like them across the industry — the past year-plus has resulted in a monumental shift in how content is both produced and distributed. And even when the pandemic ends, the way filmmaking is done has likely forever changed because of it.

THE NEW STATUS QUO

The use of virtual production techniques — melding live-action with computer graphics in real time, often with the help of powerful game engine platforms — existed before the pandemic, with Technicolor's visual effects house MPC's work on 2019's *The Lion King* being among the more notable occasions where a physical set wasn't needed.

Among all the media and entertainment advances to emerge from the pandemic — remote workflows, a heavier reliance on cloud technologies, the use of artificial intelligence (AI) and machine learning (ML) tools to automate and streamline key production tasks — it was the promise of virtual production that MESA members seemed most excited about.

"The key benefit of reducing the need to travel for on location shooting has given virtual production a material boost in financial viability," said Sohonet CEO Chuck Parker. "While the pandemic persists, virtual stages are both a means to continue production safely and to reduce the cost of on location work. If the practical effects delivered via virtual production can reduce the overall VFX budget for productions as promised, then this trend will accelerate rapidly."

The upfront capital cost of virtual production technology is expensive (and the techniques have yet to be embedded throughout workflows), so Parker expects

only modest growth for the technology this year. "The winners in the race to virtual production will be the businesses that can perform at scale with the available capital to invest in the resources required to support this industry pivot while re-invigorating their core VFX business," he added.

Jack Watts, VP of technology for Miami-based localization provider The Kitchen, called virtual production a "game-changer "for the industry, specifically for the independent film community.

"Games engines such as Unity and Unreal Engine have evolved to the point of being able to deliver 4K photo-real graphics and high frame rates, and when coupled with the open-source community, will allow any small-to-medium filmmaking team, with a decent level of technical prowess, access to a medium of storytelling where you would have previously been limited by your budget," he said.

That's music to the ears of Edward Churchward, co-founder and CTO of Arch Platform Technologies, which provides 100 percent cloud-based VFX and post-production pipelines using Amazon Web Services (AWS) and IBM Cloud.

"The largest shift has been that now VFX and film production studios see the value of having remote teams and enabling them to continuously work in a secure, fully virtualized environment that maintains the integrity of the original content," he said. "Moving production and post workflows to the cloud also means faster review and iteration in the VFX process, especially when tools are integrated in the same cloud environment.

When the pandemic arrived, the shutdown of productions meant the death of several VFX firms, many stuck with large overhead costs for empty offices and the transfer of equipment to artists' homes during lockdown. Being in a virtual environment, however, showed VFX and production teams that physical workstations aren't required to achieve the best visual effects,



Chris Tribbey is the editorial director for MESA. An award-winning journalist, he's previously covered the media and entertainment industry for Variety, The Hollywood Reporter, Home Media Magazine and Broadcasting & Cable. chris.tribbey@mesaonline.org
@CCTribbey

Churchward said.

"We are seeing the advent of a time when you won't need to shoot a scene, send a frame for VFX, and make adjustments in post-production," he said. "Directors will instead be able to see on their screen, as they film, the 3D monster or whatever effects they want. Instead of post-production, most VFX will be done pre-production, with filmmakers waiting to start shooting until all effects are done so they can see their complete vision as they film."

REMOTE EVERYTHING

AWS made industrywide waves in late April with the launch of AWS for Media & Entertainment. The initiative is geared toward making it easier for media

Filmmakers working on the upcoming documentary See to Sea record on the streets of New York City during production of the film in early 2021.



and entertainment customers to implement and deploy purpose-built AWS capabilities and partner solutions, and comes with Amazon Nimble Studio, a new suite of tools that enable customers to produce content entirely in the cloud, and create a functional creative studio in hours

"The new suite of Amazon Nimble Studio tools, combined with the power of AWS for Media & Entertainment services, gives customers access to onboard and collaborate with artists from anywhere in the world, and make, distribute and archive features and episodic series entirely in the cloud, eliminating the expense of a studio buildout," AWS announced in a statement, adding that more than 400 AWS partner offerings were included.

It's yet another advancement during the pandemic for media and entertainment that promises to be around long after COVID-19 is no longer hindering the industry.

"Cloud-based remote production is the future of movie-making," said Allan McLennan, chief executive and founder of M&E consulting firm PADEM Media Group. "It empowers and provides the creative community production workflows that now can enable frictionless remote collaboration and content creation. Teams be they large houses or small, producers, directors and writers or independents can easily connect, contribute and advance projects."

He said the industry has recognized that virtualized and remote production is a welcome path toward delivering on the needs of today's content consumption demands and "what is now key, in order to deliver on this promise, is the immense need is to have an in-depth understanding, expertise and clarity on how all of this fits together, in order to build and meet these goals head on and deliver on these ambitions."

Ian Main, technical marketing principal at remote workspace specialist Teradici, said the past year proved that the remote desktop user experience can be exactly the same as being in front of any studio workstation.

"This might sound simple, but it's a huge advancement for media and entertainment, and similar industries like game development, which may have been skeptical in the past of remote production meeting their very specific security and performance needs," he said. "Now they've experienced it for themselves, and we've heard many, many success stories." That includes Canadian game developer Relic Entertainment's designers and artists remaining productive while working from home during the pandemic, and VFX studios such as Hive VFX, JellyFish Pictures and Untold Studios

successfully leveraging public cloud workstations to increase geographic access to talent, enable rapid scaling, and shift to OPEX-oriented, on-demand operations.

"We've seen M&E customers like Technicolor launch mission-critical workloads from across the globe, encompassing visual effects, animation, post production and all other aspects of their business," Main said. "Remote work will be a mainstay for most of our customers, including for production workflows, because it helps them be more efficient with how they get the work done, and provides a lot of flexibility to attract and retain employees, as well as to leverage global talent and contractors."

Russell Wise, SVP of sales and marketing for Digital Nirvana, developer of AI- and ML-powered knowledge management solutions for M&E, said remote production is here to stay, and the pandemic merely accelerated video producers' adaptation to remote collaboration workflows, without sacrificing production continuity. Well before the pandemic, advanced AI and ML tools "were beginning to transform virtually every aspect of content creation and distribution — bringing new levels of accuracy, efficiency, compliance, and cost savings to media operations," he said.

"And now, AI-based tools delivered in the cloud are facilitating a broad range of remote tasks throughout the content lifecycle, from acquisition and contribution to postproduction and then final distribution on a variety of platforms," Wise said. "By automating the process of capturing metadata for large volumes of content, AI and ML technologies replace burdensome manual processes and save media organizations countless hours of manual work."

From content enrichment to repurposing and localization, quality assurance and compliance to monitoring, AI and ML tools are automating and streamlining key production tasks in remote environments, he added.

"For the most part, the technology that makes virtual and remote productions possible had already existed," said Eric Wynalek, VP of strategic initiatives for cloud-based media collaboration and digital asset management solutions provider Shift. "We haven't reinvented the wheel here.

"What this past year has forced us all to do is think about that technology differently, and be creative with how we use it to solve these new problems. I've been especially inspired to see the enormous power and responsibility that has been taken by on-screen talent to self-shoot their own footage, and how directors, gaffers, and cinematographers have had to become virtual teachers to create the shots they want at the hands of

THERE ARE ALWAYS NEW CHANGES

on the horizon for the production industry, because production is innovative by nature, whether in response to a crisis or simply for innovation's own sake. This past year has proven that remote options are viable. And there's no need to go back.

someone else."

There are always new changes on the horizon of the production industry, because production is innovative by nature, whether in response to a crisis or simply for innovation's own sake, Wynalek said. Remote feeds and off-site video villages are likely here to stay long after this pandemic is over. "This past year has proven that remote options are viable, and there's no need to go back," he said.

LOCKING IT ALL DOWN

Any discussion around working on productions remotely invariably results in questions around just how secure everything is, from the physical level to the entire digital workflow.

The short answer: that depends.

"With the move away from physical security within an office, individual companies were forced to make decisions on how they would monitor assets in the field and from home offices," said John-Thomas Gaietto, executive director of cybersecurity services for Richey May Technology Solutions. "We've seen everything from companies requiring video cameras on individuals within their homes while they work to nothing at all."

As it relates to the digital workflow, many companies are struggling to protect their endpoint computers with basic blocking and tackling, such as patches and local firewalls, he added. That's because, traditionally, security controls were designed to be centralized within an office. Computers going home meant companies had to make compromises between being able to keep working and strong cyber controls.

This past year, some companies adapted and moved their entire workflow to the cloud using virtual computing platforms, to manage assets from production to post production. "We've seen a large increase in these types of solutions," Gaietto said. "Better yet it's opened the playing field up for start-ups like Klio Studio that are attempting to create a complete platform that

Continued on Page 154



ABSTRACT: Over the years bold innovation came to production activities in terms of sound, color, cameras, and digitalization. The pandemic accelerated the virtualization of compute, storage and accessing production creation talent across the nation and the globe. But there is more to come on both the innovation and improvement fronts. Improvements will continue to come related to security, cost effective data storage, remote compute, content transmission, and other necessary creation anywhere cornerstones. Improvements will continue to come related to security, cost-effective data storage, remote compute, content transmission, and other necessary creation-anywhere cornerstones.

By Jeff Caldwell, VP, Digital Integration, **Cloud Partners, ATMECS** Animation, live action, scripted TV, reality programs, music, and other content creation efforts all center on traditional development, pre-production, production, post-production and distribution activities. Enjoyment, and monetization occur at the end of the process. Over many decades major innovation came in terms of color, sound, cameras, and digitalization. The recent pandemic has accelerated workflow improvement in the areas of cloud compute, storage, and production teams working at home and across the world.

But there is more to come on both the innovation and improvement fronts. Improvement will continue to come related to industry anthologies, platform adoption, security advances, cost-effective data storage, remote compute, file movement, content transmission, and other necessary creation-anywhere cornerstones. But more important is how will technology innovation change the way stories and music are created.

It's not enough to simply take old production processes and place them in the cloud. That is just improvement. With all the digital innovation technology capabilities at our fingertips we must follow Steve Jobs' mandate: "Think different."

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maximizing

value

in a streaming world?



The idea behind an Interactive Media Creation Platform



Production Enjoyment IMCP Interactive Media Creation Platform Distribution Post Production

CREATIVE PROCESS AND IMPROVEMENT

Improvement: Make something that already exists better.

Let's take a look at storytelling as part of the overall media creation and consumption process. Songwriters have an idea. They combine music and words to turn that idea into a story/convey a message. The listener feels an emotion and likes or dislikes. Typically, a movie, TV show, or video comes from an idea that is greenlit, and then teams of creators and talent are assembled, and the final product is created and distributed to the viewer.

That's very much a creative process where there's a starting point to the process that comes to an end before consumption, revenue, and enjoyment begins. This traditional process allows for little to no i teraction from the creators to the consumer, until the magical distribution barrier is reached.

Our industry has been focused on taking the age-old creation workflow process and adding technology, for the most part, to improve existing processes, but never innovating the underlying storytelling creative process. Color was innovative. Sound was innovative. Both of these capabilities were new and had never been done before.

Very much a creative process where there is a starting point to the process that comes to an end before consumption, revenue, and enjoyment begins.

This traditional process allows for little or no interaction from the creators to the consumer until the magical distribution barrier is reached.

Our industry has been focused on taking the age-old creation workflow process and adding technology for the most part to improve existing processes, but not innovating the underlying storytelling creative process. Color was innovative. Sound was innovative. Both of

these capabilities were new and had never been done before.

Today's improvement in our creative industry deals with some of the following: what cloud provider or providers should the industry use, what editing toolset(s) are best, what virtual desktop infrastructure (VDI) technology is the best to reduce latency, how do we implement better security, how can files be compressed and moved around the globe, how much security is enough, how can artificial intelligence be added to monitor the process, and how can production costs decrease?

CREATIVE PROCESS AND INNOVATION

Innovation: Make something new.

How we can use technology to drive innovation, not just improvement?

Let's suppose we want to include the viewer/consumer in the creative process, and remove media enjoyment from the end of the process, and instead make the viewer part of that process. Let's move enjoyment from a sort of passive experience to an interactive creation experience. Along the way we can make storytelling not one-size-fits-all, but more of a tailored viewer experience (which can also create new revenue streams).

Didn't like the way "Game of Thrones" ended? Don't worry, you can make your own ending. Or endings!

What would an innovative interactive workflow look

Continued on page 156



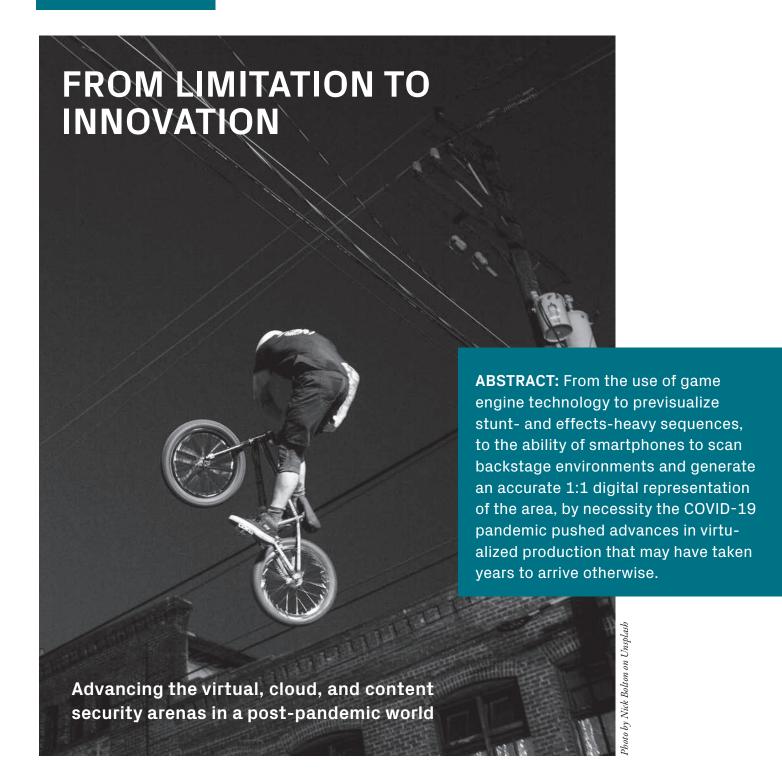
Jeff Caldwell is the VP of digital integration and cloud partners with ATMECS. He is well known in the media and entertainment industry, and the technology realm in general, as a business professional with an innovative vision who also has the expertise to make the vision a reality. jeffrey.caldwell@atmecs.com @ATMECS

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By Ramy Katrib, CEO, DigitalFilm Tree While the COVID-19 pandemic has rocked the media and entertainment industry in ways that will likely take years to fully grasp and process, one of the most immediate effects of this concentrated period of increased limitations has been a wave of increased innovation. Ideas and workflows that we had long been evangelizing at DigitalFilm Tree — ideas that seemed strange or even uninteresting to some — suddenly became not only innovative, but necessary for our community to continue forward.





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Remote, Secure, Cloud-Based Solutions

The demands of today's remote and virtualized productions call for cloud storage and file management solutions —
from set to finish — that guarantee security.

geopost

For instance, in the realm of virtual production, the utility of using game engine technology to previsualize stunt- and effects-heavy sequences for film (and especially the fast-paced world of scripted television) has skyrocketed in the last year, allowing directors, DPs, and production heads to virtualize and develop tricky, expensive productions long before a single step onto a set is taken. Filmmakers can now iterate from the safety of their homes for weeks or even months before physical production begins, and they can do it all with the click of a Zoom meeting. And from my point of view, one of the most interesting — and essential — advancements in the world of pre-vis is something we call "safety-vis."

Safety-vis uses the same fundamental tech and process of pre-vis — virtualizing an environment for a creative team to develop within — but for planning beyond the lens, creating a virtual replica of an entire production's backstage work areas and offices. Addi-

tionally, now that the iPhone 12 offers Lidar scanning functionality, a production can easily and affordably take a Lidar scan of their entire backstage environment, which then generates an accurate 1:1 digital representation of the area. This is exciting, as Lidar scans used to be a very high-end and cumbersome process, and it's now becoming democratized and available to just about anyone. By taking that scan, we can tell how big a production space is, and how many people can safely work within it and still maintain strict COVID protocols and social distancing via measurement tools. We've worked with COVID safety officers to prototype this safety visualization, and they've found it to be an incredibly useful tool, as have the major studios and streaming platforms with whom we've shared it.

Much like the evolution of pre-vis to safety-vis, cloud technologies have also experienced an intense re-focus in the last year. Pre-COVID, evangelizing

Continued on page 164



Ramy Katrib is an award-winning filmmaker and CEO and founder of DigitalFilm Tree, a post-production and software development company. Ramy champions a multidisciplinary work culture, led by world-class creatives and technologists working hand in hand to solve huge problems. DFT clients include ABC, A&E, CBS, Disney, Fox, HBO, Netflix, Turner, Warner Bros, and first-time storytellers alike. info@digitalfilmtree @DigitalFilmTree



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ORCHESTRATING PIPELINES WITH CONNECTED TECHNOLOGY



ABSTRACT: While returning to the office is inevitable, remote and distributed work is here to stay. Due to cloud-security advancements — among other trends — we're witnessing a connected-technology (r)evolution, where the orchestration platform is becoming central to studio and production company workflows, and the integration of tools and connecting storage around it are now commonplace.

By Paige Barnett, VP, Client Services, 5th Kind In 2020, changes in our working landscape accelerated innovation in our technologies, our processes, our communications, and how we lived our lives. And now, in 2021, that spark of inspiration, though shaded by the fatigue of global circumstances, has ignited a connected technology (r)evolution.

Seemingly every industry is seeking solutions to similar questions about how to support new ways of working. We're testing new products, fine-tuning solutions, and sharing ideas more than ever before. Media studios, in essence, are becoming technology companies, as they move their operations to the cloud without sacrificing security. Combine this with the rise of remote and distributed work alongside a return to the office, and it's clear that the next phase of innovation is the connected technology (r)evolution.

THE RISE OF ORCHESTRATION or hub platforms helps link pipelines end-to-end. They reduce siloed teams and increase digital collaboration productivity by reducing the number of tools for a job, and by creating an access point to a curated tool set.

This (r)evolution is a byproduct of several convergent trends that are leading to the adoption of more comprehensive orchestration platforms which can operate as the heart of entertainment company workflows. These integrated tools and connected storage across tool sets will eventually be commonplace. What's more, we find ourselves in the midst of this (r)evolution now. We're seeing immediate industry demands and use cases for it with remote production, post production, and marketing workflows.

Orchestration platforms are systems that act as an organizational hub through which many other tools connect as spokes, to help automate events and streamline repeatable processes. They centralize content and file access, making it easy and secure to store, find, and reuse media. Through open APIs and integrations, orchestration platforms easily pass content back and forth between familiar tools, enabling teams to access or make changes to files and return them to the central system, which improves visibility across the end to end workflow. They facilitate communication within the centralized hub and integrate communications for external tools when required. True to their name, they help to orchestrate most, if not all, aspects of one or multiple workflows. Examples of such tools include CORE by 5th Kind, Workable, Oracle, Kofax, and Blue Prism.

TRENDS LEADING TO THE ADOPTION OF ORCHESTRATION PLATFORMS

Tools overload

Collaboration tools have become more ubiquitous due to most people working from home. However, the presence of more tools doesn't necessarily streamline nor improve collaboration. Where processes are not clearly defined, numerous tools can actually cause more confusion about how, when and where to communicate. Distributed teams end up paying for it in produc-

tivity loss, information loss, and frustration.

The rise of orchestration or hub platforms helps link pipelines end-to-end. They reduce siloed teams and increase digital collaboration productivity by reducing the number of tools for a job or by creating an access point to a curated tool set. Orchestration platforms also recognize that different teams communicate differently, and provide the opportunity for multiple tools to be integrated into their product.

The primary goal of the orchestration hub is to streamline tools across teams and workflows, integrating best-practice tools to complete workflows as determined by the client. Secondarily, it must capture the data and content passed between these tools.

Media companies are the technology companies

As mentioned, media companies are becoming technology companies. Starting with studios operating at global enterprise scale, IT departments now play a major role in both business operations and productions finding, providing, and supporting the best tools for the task at hand. Successes become best practices, which are set for vendors and partner production companies, who may also use such tools for deliverables and communications. Thus, vendor tools are required to have open APIs and the ability to integrate with other tools in order to avoid bouncing teams between applications for communications, content, data, etc.

The rise of cloud security

Due to the sensitive nature of the entertainment industry, security requirements are on par with such industries as health, finance, and government. Cloud technologies are more secure than ever, and while onprem/cloud combos are in use for security and expedited upload and download processes, cloud-only technology is now just as secure and competitively priced. This is leading to the widespread movement of studios and



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media companies to work and secure content directly in

Security best practices adoption

While there are still vulnerabilities when accessing data in the cloud, studios have set out to follow best practices set by governance frameworks like ISO, ISIL, and SOC. The industry, via MESA's Content Delivery & Security Association (CDSA) Tech Committee and the Trusted Partner Network (TPN), continues to pioneer a "best-of" combination of standards which encourages adoption at all levels of the media supply chain. Orchestration-tool vendors that meet both TPN and security testing standards will be more widely adopted.

Remote production demands

Production sets become more connected every day. Because they create the content, they are held to more stringent security standards than their business counterparts. Moreover, because of the speed at which productions work across hours, remote locations, and broadcast schedules, they require the best-in-class technology. While open APIs allow many one-off tools to be cobbled together in the production pipeline, this approach tends to service just one aspect of production and misses assets for different workflows, such as marketing and distribution.

Orchestration platforms feed data, content, and livestreams to wherever the remote crew and above-theline staff may be. They assist with expediting pipelines, and enable smaller on-location footprints, which reduces known risks. The hub allows omni-directional communication, content and data flow between the teams and business divisions that serve a production at every stage of the process, and can support one, multiple, or all stages of the production pipeline.

Media production pipelines: pre is the new post

Whether it's for commercials, film, or television, virtual content, such as virtual sets, are now being created as early as pre-production. What was once a linear set of steps from pre-production through post is more multilateral than ever. Virtual content can inform the production process and enables creators to reorder some stages of production. As these practices and technologies, like LED walls, become more cost effective, we'll see them used more widely. But these processes necessitate a central asset management system to be the frontend access point for content. Digital asset management is a key component of solid orchestration platforms, which enable cost effective storage, easy access to content, and supporting collaborative communication features.

Cloud storage advancements

Cost-friendly cloud storage is becoming more accessible. And backend tools like AWS Media Exchange and Media2Cloud ease the movement of content through the pipeline, especially large files such as RAW OCNs and TIF images intended for billboards and building-sized designs. Using orchestration tools for a frontend interface and user-friendly accessibility, the use of cloud storage and such tools will become a regular practice.

Orchestrating workflows: a real-world use case

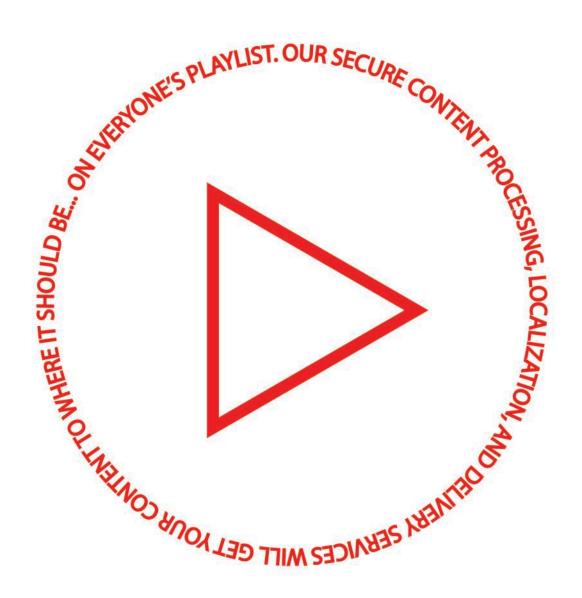
A film production example in CORE by 5th Kind begins in pre-production. Here departments such as casting, wardrobe, art department, the production office, and VFX upload, tag, share, collaborate on, and approve casting decisions, costume design concepts, set and prop builds, script notes, legal contracts, and CGheavy scene set ups.

In production and post, the live camera streams are captured from Teradek which producers, crew, and stakeholders can view on the platform, and all live camera feeds are recorded and auto-tagged in five-minute intervals. ScriptE and ALE data feeds into the system from the script supervisor and DIT station. Dailies tagged in the system kick off forensic watermarking for distribution. The director's Circle Take status auto triggers an event, like making the dailies selects available to the editor. Editorial sends proxies to Adobe for edits before passing it back into CORE. Sound, color, and music pass their assets through the system via AWS MediaExchange for editorial's final compilation into CORE.

In marketing and distribution, a marketing director receives production stills, character assets, and other materials they need for theatrical distribution and licensing. Compiling these into a deck, they present it live to hundreds of global clients and stakeholders, each of whom have individually watermarked assets. On the distribution side, the final mastered and localized assets are pushed from CORE to OWNZONES for downstream distribution.

Orchestration hubs: the future of media enterprise management

The orchestration hubs of tomorrow must be extensible as well as flexibly designed to accommodate a multitude of workflows. They provide real-time visibility into status, events, and key checkpoints throughout the production lifecycle. With capabilities such as tagging to improve timely access to assets, fine-grained access controls, and comprehensive logging, a reliable platform, like CORE by 5th Kind, will meet the needs of the most demanding media and entertainment companies. H



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THE CLIENT EXPERIENCE IN THE **AGE OF VIRTUAL WORKFLOWS**



enable global expansion. However, companies serving the M&E industry must not lose sight of the importance of direct client interaction with dedicated and knowledgeable staff. This is especially significant during a global pandemic, where content owners big and small need confidence that their product is being given the attention it deserves.

By Ramón Bretón, CTO, 3rd i Digital

The shift towards virtual workflows to serve the M&E industry began well before the global pandemic. While economics, logistics, and expansion were the initial driving forces for this change, the sudden need to move to a primarily remote workforce mandated by health and safety guidelines hastened this shift.

The maturation of fully remote systems enabled a global, localized workforce to serve an international client base. Additionally, when systems, staff, and client workload are expanded equally, growth potential is near-limitless.

All client- and staff-facing systems are designed with an intuitive interface free from frustration. While customers and personnel



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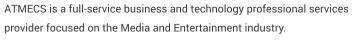


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both use these systems, their goals are different. Staff are motivated by their desire for employment, while clients seek to accomplish tasks in a quick and efficient manner. Virtual workflows and the systems created to interface with them tend to lead to independent use on the part of the client. While this freedom from the need to schedule an appointment is a benefit, the lack of personal interaction has its drawbacks.

THE CLIENT EXPERIENCE

Before cloud-based systems were ubiquitous, interactions between clients and company personnel were very different. Nearly every step of the process — from introduction to final project review — occurred in-person or on the phone. Clients engage with M&E companies for their expertise, and these person-to-person interactions were instrumental in building client confidence in their choice of partner. Aside from some direct interactions between staff and customers when setting up accounts or establishing new project parameters, customer-facing virtual systems reduce the need for direct communication.

When designed successfully, virtual portals deliver a smooth and efficient end-user experience while eliminating person-to-person interaction. Despite making staff available via email, chat, or telephone support and encouraging customers to lean on these when they require assistance, guiding clients to a web-based interface implicitly directs them to accomplish tasks on their own. Virtual workflows are here to stay, but concessions can be made in service of the customer, clearly demonstrating that their projects are being given the attention they deserve.

THE NEW CUSTOMER EXPERIENCE

In order to maintain virtual workflows — while providing an increased level of direct interaction between staff and clients — a company must first temper their expectations of profit. Specifically, an appropriate balance between personnel and workload must be prioritized, despite the increase in payroll. The ability of staff to sustain direct, ongoing customer relationships must never be exceeded by a growing client base or the number of projects taken on.

While many customers appreciate the autonomy provided by virtual portals, others may perceive this as a shifting of responsibility away from company staff back onto the clients themselves. Regardless of client com-

VIRTUAL WORKFLOWS are here to stay, but concessions can be made in service of the customer, clearly demonstrating that their projects are being given the attention they deserve.

fort level with the independence provided by web-based portals, some basic steps can be taken to strengthen the relationship between client and staff.

First, introducing a single staff member to serve as the primary contact and project lead conveys that client assets are being attended to by human beings and not just automated systems. This project lead would then explain the processes inherent in the work to be accomplished while introducing secondary staff members as needed.

Second, interactions between client and staff are best served via video conferencing. This "face-to-face" placebo dictated by the pandemic is the clearest way to reinforce direct involvement on the part of company staff with the client's project, more so than emails or even phone calls. Whenever possible, clients should be encouraged to access these sessions via computer so staff can share their screen to demonstrate the use of the portal, share reporting results, etc. Additionally, enabling staff to remote into the client's computer to directly assist them when needed provides an additional level of service.

Finally, the gardening adage "the best fertilizer is the gardener's shadow" applies here as well. Time spent in direct person-to-person communication cultivates customer confidence. For example, instead of delivering project status results via email, a screen-shared review demonstrates personal involvement with the client's product.

It is not necessary to shift away from virtual workflows to better serve clients. On the contrary, web-based client portals provide numerous advantages for the end-user. However, many M&E companies would be well-served to treat virtual portals as a tool, rather than as a means to reduce payroll. By returning to a more hands-on approach to customer relations, clients will be given total confidence that they chose the right company to serve their project. \blacksquare



Ramón Bretón serves as chief technology officer for 3rd i Digital, a pioneering company in the field of quality assurance for the media and entertainment industry. Prior to his 18 years at 3rd i Digital, Ramón spent 10 years in the music business as an audio mastering engineer, giving him nearly 30 years of experience contributing to quality entertainment for consumers. ramon@3rdigc.com



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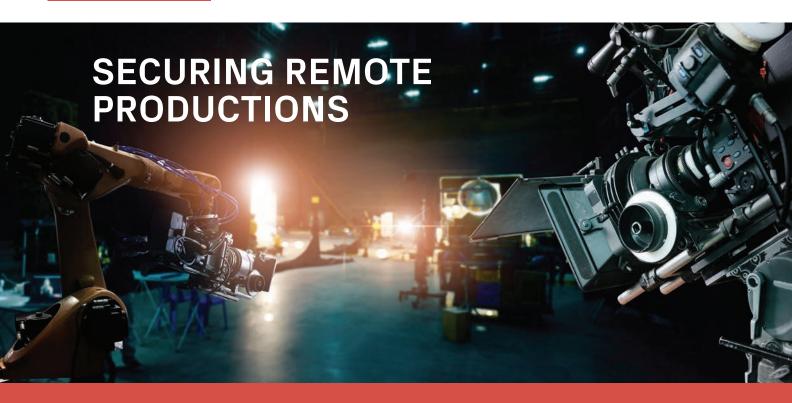




SECURITY



From production to distribution, from physical sets to a dubbing artist's living room, the last year-plus has presented all sorts of new security challenges across the industry. Pirates continue to target our most valuable assets, and cybercriminals have proven highly adaptable when it comes to bypassing the protections we put on our networks. In the ongoing war between media and entertainment and those who target it, collaboration, adaptability, and constant awareness are making all the difference.



ABSTRACT: As the industry responds with flare and innovation to support remote productions through cloud technology, many of the same principles apply when it comes to security. Managing what happens on set remotely, testing correct configurations, and securing wireless connections are all critical areas. This article discusses key priorities and the different approaches that can be adopted.

The pandemic-led increase in remote productions has also increased security risks

By Chris Johnson, CEO, President, and Mathew Gilliat-Smith, EVP, Convergent Risks

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The pandemic accelerated innovation and required rapid adoption of cloud-hosted infrastructure and software-as-a-service (SaaS) solutions to support remote production. Those that were able to respond quickly and remain agile were better prepared for the transition. While remote production is nothing new, pandemic restrictions required that technologies provide more precision, scale, and speed.

The main challenge that productions encountered was that they were required to work at such a rapid speed with limited engineering bandwidth. In certain cases, they took calculated security risks to keep operations going. Production technologists and crews were required to solve problems creatively on-the-fly, while ensuring that security implementations or configurations would not impact the production's up-time.

Production crew and technologists used their creativity, in some cases, by utilizing existing tools, in a manner in which they were not originally designed, to solve workflow challenges, or designed their own integrations with several supporting technologies. Since workflows now require creative solutioning to support ongoing remote workflows, Convergent recommends that production best practices are expanded to provide more guidance on how to implement software developer kits (SDKs) effectively and ensure usability, correct mapping of endpoints,

WHEN RAPIDLY DEPLOYING new technology solutions, it is important to ensure that environments are technically secure. Whether the solution is hosted on-premises or in a public cloud, perimeter pen testing is important to detect any exploitable weaknesses.

and continual updating. Guidance and collaboration is also needed from technology providers so proper configurations, compatibility, and security settings are documented to ensure cohesive integrations between partners.

Studios should consider updating their production best practices to include hardening guidance for new technologies that were recently implemented to support remote workflows and provide them to their IT infrastructure vendors servicing their productions. When IT staff are in a hurry, practical hardening checklists save time, prevent configuration errors, and ensure that environments are set up securely. As a community, we need to collaborate with technology companies to aid in the creation of these documents.

Additionally, it's essential that physical and general security guidelines are also addressed since there are still physical components to remote workflows. Camera raw assets are still on-set and require protection, along with content assets saved on hard-drives and LTOs. Until the assets are safely uploaded to the cloud environment or are delivered to the dailies vendor, they still need supervision — especially if there are less people around. Even a low resolution copy accidentally finding its way to social media can be very damaging. Personnel still need security training and a better understanding of the production's security policies — especially regarding use of social media, confidentiality clauses, and bring-your-own-device (BYOD) policies.

SaaS solutions have been integrated within production workflows for many years to create digital pipelines

designed to provide controlled access while prohibiting content downloads. During the pandemic, there was an immediate need for better streaming capabilities to minimize the number of crew on set. Productions partnered with remote streaming services that were able to stream a single video to 30 or more people. These streaming solutions were also integrated with hardware and software packages to control cameras and provide situational awareness for collaborators who needed to view the entire set and what's being captured through the lens. With more dependence on third-parties, Convergent recommends that content delivery network (CDN) providers are vetted carefully before committing. It's important to learn how often data is cached, what the provider's security practices are, and whether failover measures are adequate and in place.

When rapidly deploying new technology solutions, it's important to ensure that environments are technically secure. Whether the solution is hosted on-premises or in a public cloud, perimeter pen testing is important to detect any exploitable weaknesses. Cloud configurations should also be tested for misconfigurations. For cloud workflows, Convergent has observed that many clients have similar deficiencies. Key items are often not in place such as cloud security training, multi-factor authentication, monitoring, and anti-malware solutions. We also find that the shared responsibility model is often not fully understood by all parties. Convergent has seen an increasing demand for its services from content owners wanting independent cloud security assessments and

Continued on page 160



Chris Johnson has been an M&E content security specialist since 2001, with a diverse range of experience and operational knowledge covering the music, gaming, studio and TV broadcast industries, including the production, post and digital distribution supply chains. chris@convergentrisks.com @ConvergentCEO



Mathew Gilliat-Smith has 20 years' experience in the media and entertainment sector and has strong relationships at many levels with studios, broadcasters and vendors. Mathew is responsible for developing Convergent's initiatives in cloud and application security, penetration testing and general consultancy. mathew.gilliat-smith@convergentrisks.com @mathewgs



By Gary Davis, Chief Marketing Officer, INTRUSION

ABSTRACT: Recent cyberattacks have proven we're no longer fighting just hackers: nation states have waged cyber warfare on our economy, and no industry is safe. Cybercriminals can live in the networks of media and entertainment companies for months, learning their most valuable assets and ways to disrupt business. We need a new approach to cybersecurity.

It's all over the news. Massive cyberattacks disrupting critical businesses, systems and government organizations, and it seems there's a new one every day.

Even some of the top cybersecurity companies are being brought down or severely disrupted by substantial, harmful attacks to their systems. This is a clear signal that our approach to cybersecurity has failed.

CYBERCRIME HAS EVOLVED. THIS IS CYBERWAR.

What does this mean? Cyber warfare is more far-reaching than cybercrime and rightly classified as a war because it often includes the full resources of nation-states whose goal is to slow down an adversary (in this case U.S. businesses), steal secrets or inflict pain. These are foreign aggressors who have spent decades trying to break down and dominate their enemies and want to capitalize on whatever they can, whether that is new technologies, a crisis or vulnerabilities. They are, in fact, leading PhDs and computer scientists employed by their governments with well-funded budgets that exceed the military spending of some third-world countries.

It's time for all U.S. organizations, small and large, to rethink our approach to cybersecurity in order to address this cyber warfare.



When Legendary Studios assembles films quickly and cost effectively, Wasabi plays a starring role.





For media and entertainment companies, this means bolstering the ways in which we protect critical, confidential assets and content. The opportunities for cybercriminals to disrupt businesses within the industry are vast. Criminals are not just breaking in and stealing whatever they can find as quickly as possible. They will breach a network and live there for months, years even, looking for the most valuable information to steal and the best ways to cause damage.

What could a cybercriminal access on your network given the time to search for it? One of the most common attacks media and entertainment companies face is ransomware, where adversaries identify your most valuable assets and hold them hostage until you pay a ransom. Several large studios and streaming companies have fallen victim to this type of attack where episodes, scripts, and more were stolen, with a threat to have them leaked until the organization paid a fee to have their assets returned. And for sports organizations, criminals could target sensitive documents, including trading and recruiting plans.

These nation-states can also cause massive disruption with the information and assets they access. For example, an attack on the 2018 Winter Olympics in South Korea, disrupted the opening ceremonies. A soccer team in the UK was the victim of an attack where the criminals shut down the turnstiles in the team's stadium, preventing fans from entering or exiting. All of these issues can cost organizations money, time, and reputation.

So, what is the best way for media and entertainment organizations to protect themselves?

For too long, the cybersecurity industry has focused on keeping adversaries out of networks with firewalls. Unfortunately, it's no longer effective to try to keep criminals out: they find their way in faster than we can develop new locks for the door. Once inside, attackers have a lot of freedom to talk to other machines on a network, look around for data, establish improved credentials, and download critical information with little-to-no real-time oversight.

Firewalls are important, but it's important to have additional defenses to protect critical assets. Appliances that monitor network traffic and alert to threats are important, as well as solutions that protect an organization's computers that are not directly connected to the

FIREWALLS are important, but it's important to have additional defenses to protect critical assets.

network, such as a VPN.

But even these layered approaches have resulted in serious breaches. We have to do more. It's time to rethink the ways in which we defend our critical assets. Here's how:

Assumption of infection: It's important that we assume that cybercriminals have already found their way into our networks. Because firewalls are not foolproof, we have to act as if they are already inside our network, searching for our most valuable assets.

Monitoring outgoing traffic: Once these criminals are in a network, it's impossible for them to do any damage unless they can "call home," or send information back to their servers. Utilizing a tool that is monitoring outgoing traffic and has the ability to not only identify it as malicious — either based on it being a known threat, or utilizing artificial intelligence to identify it as malicious based on its activity — but also to kill that threat in real time. Stopping your assets from ever leaving your network is the only way to keep them completely from being compromised or used in a ransomware attack.

Reduce false positives: Many solutions have high rates of false positives, meaning they identify a packet of good data as a threat. This not only disrupts an organization's operations — keeping them from getting work done — but also sends network managers on a hunt that takes up time and resources.

It's critical that we leverage everything possible to combat these highly motivated cyber criminals. The next big breach we see in the news could easily be a media company, sports league or team. Before that happens, let's shift our thinking around cybersecurity and start protecting our valuable assets and networks from the inside out.



Gary Davis serves as INTRUSION's chief marketing officer. He brings more than 20 years of executive marketing experience and a proven track record of driving profitable growth. His extensive experience spans both business-to-business (B2B) and business-to-consumer (B2C) marketing for technology companies. info@intrusion.com @INTRUSIONShield



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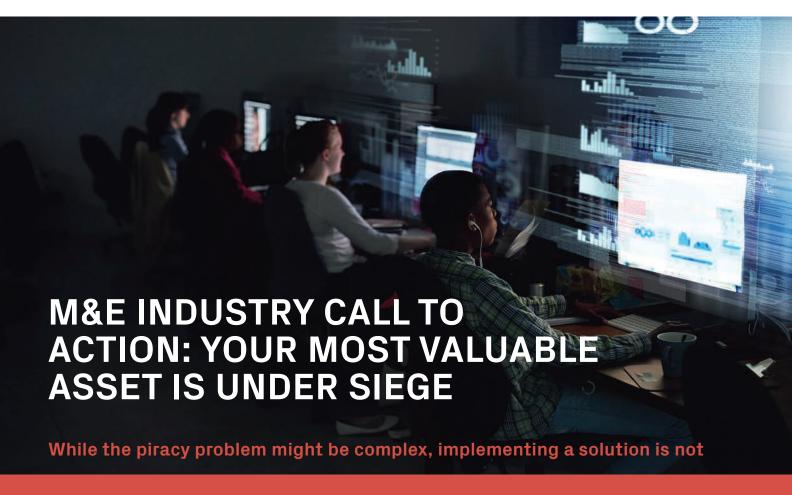
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ABSTRACT: Here we offer our insights on the current state of piracy, the pandemic's impact on the media and entertainment industry and consumer behavior, address the increase in piracy in online screening for virtual cinema and early release windows, and examine how the industry is working to address all of these challenges.

By Tim Pearson, Senior Director, Product Marketing, NAGRA

While the pandemic has undoubtedly impacted all segments of business across the world, the media and entertainment industry could be one area that has seen the most transformation.

There have been monumental shifts in everything from production, to distribution business models, to consumer expectation and behaviors. So much change has taken place, it will never go back to the way things used to be. And, knowing that it has been extremely challenging, this digital transformation is not entirely a bad thing.

The industry continues to adapt and succeed in so many ways. The pandemic kept audiences from gathering in person, forcing film debuts, festivals, sports and other live events to adjust their distribution models. At the

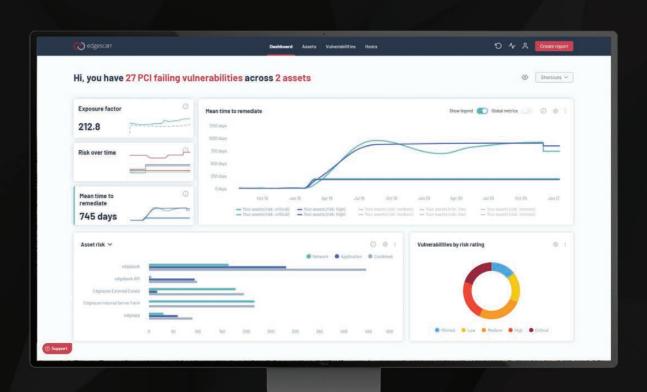
same time, with social distancing measures in place, there was — and continues to be — an increasing demand for in-home content from consumers. Delivering content through online channels is now the norm.

To adjust to this new environment, studios and other content owners have embraced premium VOD and SVOD services for early release windows, allowing their newest blockbuster movies to launch direct to viewers' living rooms. Film festivals have shifted strategies to reach audiences through online digital cinema platforms. At the same time, consumers have embraced this new world and now hold the control of where their experiences take place.

When geography and physical limitations are no longer an issue, new opportunities can be achieved. For



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IF ACTION IS NOT TAKEN, finding illegal services that deliver whatever content viewers want online, without paying for it, could gain traction and is at risk of becoming a cultural norm.

example, film festivals are no longer bound by location. They can now expand their reach to showcase great content to audiences around the world. New release movies can also reach larger audiences, that compliment, not detract from the movie theater experience option when things completely open up.

But, while much of this digital transformation has been positive, all of this does not come without consequences. Unfortunately, this online, digital, global approach means valuable content is more susceptible to piracy than ever before. And with piracy comes a significant threat to the entire industry.

Commercial pirates are taking advantage of this new media landscape and they are very sophisticated in their delivery of stolen goods. The most valuable asset — content — is given away to consumers at a free or significantly discounted price. If action is not taken, finding illegal services that deliver whatever content viewers want online, without paying for it, could gain traction and is at risk of becoming a cultural norm. This is a snowball effect that cannot be ignored. Once this cultural shift happens, it will be difficult, if not impossible, to bring viewers back into the legitimate value chain.

This is why it is imperative for the industry to come together to prioritize anti-piracy efforts. If content is not properly secured, then the M&E ecosystem's survival is at risk.

GET READY FOR THE TAKEDOWN

One of the steps being taken to combat this issue is consumer education and awareness. Unfortunately, because of the sophistication of commercial pirates, many consumers can't distinguish between pirate services and legitimate ones. This is why there are consumer-based campaigns in place to showcase the dangers of piracy. Consumers need to understand that it is not possible to get thousands of channels, all the sports and VOD content in the world, all for a minimal price. If it looks too good to be true, it is too good to be true.

While reminders like this are extremely helpful, the

fact of the matter is: it's the studios and distributors that are tasked with taking real action for impactful results.

Content owners, including the major Hollywood studios, and distributors need to understand that they are competing against pirate services. It's the pirates, not other legitimate businesses, that should be the No. 1 priority when considering competition.

The first, and most impactful step is to cut off the supply of content to pirates. Forensic watermarking, multi-DRM and anti-piracy solutions and services are all essential to increasing the security of digital cinema virtual screening packages and premium VOD and SVOD content.

Forensic watermarking identifies the source of a content leak quickly and efficiently so that effective anti-piracy action can be taken. At the same time, a multi-DRM solution delivers content protection by leveraging both platform DRM and advanced features to maximize service reach and achieve operational efficiency. When used together, you have a strong starting point to guard against service and content piracy.

By layering on anti-piracy services, such as monitoring, legal services, take-down and IP-blocking, as well as data-driven security analytics, you have a comprehensive solution to seriously take on the pirates.

DON'T WAIT TO TAKE ACTION

The fact of the matter is, while the piracy problem might be complex, implementing a solution is not. There really is no legitimate reason for studios and distributors to not take steps to protect the great content that is the lifeblood of the industry. With the right provider and experts on your side, integrating the right anti-piracy solutions and services is a seamless and easy experience that will undoubtedly pay off in the long run. Not only for content owners, but the entire M&E ecosystem.

It's up to the industry to demand that pirated content is not acceptable. Taking action now against piracy must be one of the highest business priorities, and if you don't take action now, you're essentially giving away the keys to your castle. \blacksquare



Tim Pearson is senior director of product marketing for NAGRA. His areas of focus covers next-generation content value protection and user experience TV solutions that leverage IP, cloud and data technology. dtv@nagra.com @NARGAKudelski

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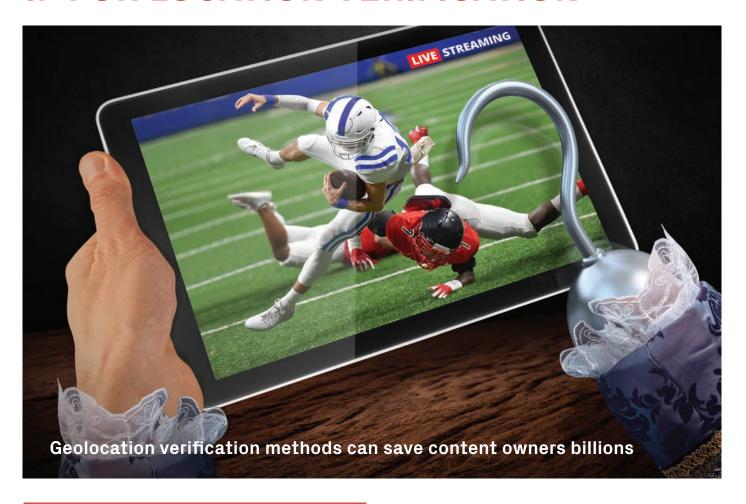
As the Over-the-Top (OTT) media landscape exploded to **more than 300 services** in the last year, content fragmentation across an array of platforms has created a cutthroat competitive environment.

PK's Media Digital Experience Index (MDX) measures how well OTT services are positioned to **reach**, **engage and retain users**. It identifies the dimensions and capabilities that streaming services need to create a more sustainable business model.

Click here to download the report and learn how streaming services stack up to customer demands.

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NEXT GENERATION CONTENT PROTECTION: MOVING BEYOND IP FOR LOCATION VERIFICATION



ABSTRACT: Faced with ever-evolving techniques to spoof an IP address, moving beyond IP for viewer location verification is becoming increasingly important for protecting geographically restricted content, especially when it comes to high-value content. Location signals from Wi-Fi, GPS, and HTML5 can now be used to stop geo-piracy and geolocation fraud.

By James Clark, Director, Global Sales, GeoGuard

Let's face it: there's never been a better time to be a streaming video service provider.

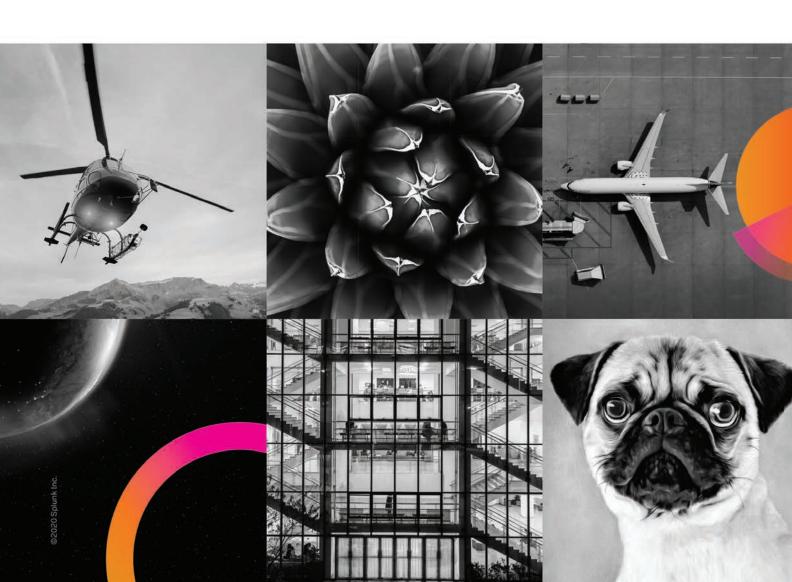
Content consumption via streaming services is at an all-time high, and there's no sign of it slowing down. A recent report by Juniper Research predicts that by 2025, there will be close to 2 billion OTT TV and video subscribers worldwide. That's a 65 percent increase from 2020. By those estimates, there's no denying we are definitely entering the golden age of streaming.

Unfortunately, legitimate consumers aren't the only ones with an insatiable appetite for binge-worthy TV and high-stakes live sporting events. Digital pirates can't seem to get enough either, and by all accounts, they're salivating at the thought of even more content to pilfer.

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Parks Associates is forecasting that in 2024, pirates will siphon off a staggering \$12.5 billion in revenue from OTT and pay TV companies. That's a growth rate of 38 percent from the estimated \$9.1 billion lost in 2019.

Clearly, piracy cannot be dismissed as the cost of doing business. There's just too much at stake, especially for premium content producers. So, as we look to the future, what can studios, sports leagues, content creators and premium OTTs do to mitigate these losses, as well as maintaining their content's value while upholding their contractual obligations?

According to a recent report published by the Streaming Video Association (SVA), forward-thinking OTTs should consider implementing a robust and layered security framework that includes tighter geographical barriers: "Poorly implemented restrictions allow consumers to access content outside the permitted territories for free and/or at a reduced price than the licensed distributor price (e.g., a boxing match in Ireland costs \$25 vs. \$80 for the same match in the U.S.)."

HOW PIRATES BOLDLY BYPASS TERRITORIAL RESTRICTIONS

When it comes to tightening up security around territorially restricted content, the SVA is careful to point out that "addresses cannot" be solely relied upon to make decisions as IP databases are often inaccurate and IP addresses can be masked with virtual private networks (VPNs)."

Approximately, three in 10 internet users use a VPN service, and more than 50 percent of those VPN users admit that their primary goal is to spoof their location in order to access territorially restricted content. Traffic to VPNs (one solution provider claims to have over 140 million customers), is driven by OTT video content popularity.

To stop this kind of piracy (aka geo-piracy), you need to implement proven tools like GeoGuard's Database

BLOCKING ARMCHAIR PIRATES

from accessing your content illegally is one thing. What about the more pervasive, tech-savvy cyber-criminals who have an array of anonymizing tools at their disposal?

solution. This Hollywood studio-approved VPN and DNS proxy detection solution has been third-party tested and found to be 99.6 percent effective against the industry's most popular VPNs. Plus, it's already used by broadcasters and premier OTT providers globally and integrated with world-leading CDNs including Akamai and Amazon AWS. It's quickly become the recommended solution of many studios, sports leagues, broadcasters and rightsholders.

Protecting content from geo-fraud is an area Akamai explores further in its recent white paper, "Inside the World of Video Pirates — How Do We Stop Them?" In the white paper, Akamai notes: "The pervasiveness of VPN services also means that Lazy pirates can easily sign up and access geo-restricted content, e.g., overseas viewers looking to access particular TV episodes. Mechanisms that can be used to protect against this activity include proxy detection technology."

GEO-FENCING IN THE NEW PIRACY UNI-VERSE

Blocking armchair pirates from accessing your content illegally is one thing. What about the more pervasive tech-savvy, cyber-criminals who have an array of anonymizing tools at their disposal? In the same way that VPNs can spoof a user's location via an IP address, there's a growing number of fake location apps and spoofing techniques designed to circumvent more advanced location validation methods, including:

■ Disabling Wi-Fi and installing SIM cards from permitted territories

Continued on page 156



James Clark leads sales for GeoGuard's geolocation and geo-circumvention detection solutions. He is responsible for identifying opportunities with customers, establishing strategic partnerships, and communicating GeoGuard's products and services to the market. solutions@geoguard.com@geoguard_

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CONTENT SECURITY IN THE WORLD OF INDEPENDENT FILM

It's on the distribution platforms to make sure content is secure

ABSTRACT: The key to maintaining content security when delivering to a streaming platform lies in platform hosts educating and empowering content suppliers. And we offer an anecdotal, cautionary tale of a festival programmer who shared her account password, putting the power of sabotage in the hands of hundreds.

By Amber Davis Johnson, Director, Communications, Branding, PR, Film Festival Flix Cybersecurity is a primary concern of organizational leaders across industries. As more and more business transactions, transfers of information, and handling of creative assets happen in the virtual sphere, companies have defense against attacks, theft and damage top-of-mind. In the media and entertainment industry in particular, organizations must strive to protect the copyrighted creative work that they produce (or that is entrusted to their care) while also educating suppliers and partners in best practices to avoid a security breach.

In the world of filmmakers and film festivals, the concern and the need for cohesive, careful practices permeates the film production and distribution hierarchy. A finite but significant number of hands touch the work. From film teams to labs to sales agents, to distributors and festivals and licensors and platforms, each person must be trained, trusted, and certified as implementing the best possible practices and tools of defense — or they must be eliminated from the process.

As reported by Deloitte: "The risks and complexity of securing content within the M&E industry are amplified because of disparities in size, function, and





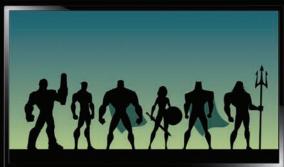














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IN THE WORLD OF FILMMAKERS and film festivals, the concern and the need for cohesive, careful practices permeates the film production and distribution hierarchy.

security capabilities among organizations within the media supply chain." And according to a best practices report from the Motion Picture Association (MPA), there are more than a dozen types of facilities that may provide services or handle content prior to release.

Film Festival Flix, an online streaming platform dedicated to film festivals, has invested heavily in building systems that allow filmmakers to upload to our platform directly. And direct delivery means reducing potential breach points. As our CEO Benjamin Oberman puts it: "If the goal is to empower film festivals to thrive in a sustainable environment online, then that sustainable environment must be secure. Leaked content, unauthorized viewers, unauthorized access — whether malicious in intent or a result of carelessness or ignorance — we have invested significant resources and time to protect against all of these breaches and more."

A film can go straight from filmmaker to platform without our team touching it. In the world of film festivals and independent film, a great deal of responsibility falls squarely on the shoulders of those providing content to the platform, or sales agent, or distributor ... and most often the filmmakers.

As a content provider it is your right to ask to see the security audit reports of any enterprise you partner with, or any organization that will have access to your film. "Do your due diligence and find out if the groups you're working with are meeting TPN standards," Oberman preaches. "Trust but verify."

He then offers a cautionary tale: One of our festival clients who was forced to use an alternate platform by a distributor shared with us that the agent representing the content provider was ignorantly sharing administrative login details with thousands of potential exhibitors, providing free-for-all access to not only the raw video files, but also all the vendor and financial accounts of the licensor.

Continuing and vigilant education within each media and entertainment enterprise, and throughout the content supply chain, can't be undervalued. Ruth Vitale, a Film Festival Flix board member, is also CEO of Creative Future, a nonprofit coalition of more than 560 companies and organizations, and more than 275,000 individuals that mobilizes members to speak

up about creativity's cultural and economic value, the importance of copyright in protecting creativity, and the massive harm caused by the global theft of creative works.

The anti-piracy work of Creative Future cuts to the heart of what we all know about the importance of security: piracy is a for-profit criminal enterprise that puts hundreds of millions of dollars in the pockets of criminals, dollars that come out of the pockets of filmmakers, film teams, and everyone in the legitimate production, delivery, and viewing process.

Like the industry, the hackers are evolving. Their methods are sophisticated, their profit potential and black-market options unprecedented. But Film Festivals, filmmakers, and other organizations and individuals can set themselves up for success.

"Prevention is the strongest protection," Oberman said. "Everything else after that becomes a defense. You can't put the genie back in the bottle."

Content providers, distributors, and all involved in the delivery and viewing processes must take advantage of every protection available. How? By partnering with enterprises who have made the investment and done the work to meet Creative Future, the Content Delivery & Security Association (CDSA), and Trusted Partner Network certifications and standards, and are committed to education and best practices. While security threats may never be eradicated from the digital landscape, creative content can be successfully secured for the maximum benefit of all who adhere to these standards. \boxplus



Amber K. Davis Johnson is the director of communications, branding and public relations for Film Festival Flix. A writer, artist and brand designer, specializing in accessible, brand-voice-specific marketing content and graphic design, she's a published poet, violinist, outdoors enthusiast and mother of three. amberjunestudios.com @festivalflix

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ABSTRACT: The increased ease of access to content across platforms, combined with day-and-date releases of new releases in theaters and via premium VOD services, has content pirates chomping at the bit.

By Miguel Bielich, Global Director, Product Marketing, Irdeto

Without question, the COVID-19 pandemic has impacted almost every aspect of life for the foreseeable future. As the world works toward getting back to "normal," how we socialize, work, educate and entertain ourselves has shifted, primarily to the digital realm.

At the onset of the pandemic in March 2020, with most movie theaters closed and people under stay-at-home orders, Digital TV Europe noted that the total average online video viewing time increased by 29 percent. And now, despite the easing of restrictions, many major theatrical releases are delayed, and studios are instead opting to send new films straight to premium VOD services, following the success of initial trials. If we add the growth of direct-to-consumer streaming services, the collective appetite for digital media has never been greater.

While video streaming offers the flexibility to distribute content across multiple devices and platforms to meet consumer demand, this ease of access also gives the pirates prime opportunity to steal and illegally rebroadcast high-quality digital assets. During the same March 2020 early pandemic timeframe, Irdeto observed an increase in pirate activity, including searches for "free" movies online, higher traffic to top pirate streaming sites, and a steep increase in peer-to-peer (P2P) network traffic. While piracy always ebbs and flows, the increased reliance on revenue from digital distribution makes protecting content against illicit redistribution more critical.

Creating or licensing original content is costly, making end-to-end security key

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to protecting revenue streams and gaining the highest return on investment possible. Many content owners are now requiring more stringent protection measures in their licensing agreements. In addition to standard content security measures, such as digital rights management (DRM) and conditional access systems (CAS), forensic watermarking plays a key role in any comprehensive content security tool kit.

Watermarking has a variety of important uses for content security depending on the type of watermarking deployed, from identifying individual unauthorized sessions to disrupt pirate streams at the source, to identifying security weaknesses in distribution channels.

In the case of distributor watermarking, once implemented, some of the key benefits for content owners include the ability to:

- Identify piracy platforms, despite logo obfuscation or substitution of audio feed
- Secure global revenue through selective and/or timely distribution strategies
- Expand insight into pirate sourcing patterns
- Gain leverage for commercial negotiations
- Audit contractual compliance of distributors

While the benefits of distributor watermarking are clear, there are some key challenges and concerns facing studios, operators, and broadcasters when implementing this process to safeguard content. Often there's a general reluctance to disrupt existing processes (some of which were years in the making), a lack of resources for the implementation of any new or complicated integrations, along with the fact that watermarking solutions typically follow a costly, one-size-fits-all business model, which may not work in every circumstance, for every stakeholder, for a variety of reasons.

Irdeto and IBM Aspera have partnered to tackle these key challenges, creating a cloud-based, pre-integrated, "pay-for-use" solution for watermarking. The Irdeto/IBM solution eliminates the expensive integrations associated with on-premises set-up, taking the complexity and high cost out of the watermarking process. This solution is primarily aimed at companies who need to distribute high-quality or mezzanine-quality content during pre-production or post-production

UNFORTUNATELY, even with every security measure in place, the reality is content will be pirated. Therefore, it's crucial to include processes aimed at protecting content throughout the value chain. Watermarking alone can provide the insights that allow for targeted business and strategic distribution decisions.

workflows, covering the need to target these efforts where they're most needed.

Cloud-based distributor watermarking provides on-demand access, with quick deployment. Source content is read and analyzed to determine the best place to insert the watermark. Sections are then watermarked as an A and B version and stored as a variant file, which contains the binary differences between the watermarked video and the original encoded source. The variant file can be stored for as long as individually watermarked copies are needed and the pre-processing step need only be done once, allowing for cost-effective, scalability. The dynamically embedded watermark provides traceability which enables the identification of illegally re-distributed content to a specific distributor.

When combined with Irdeto's online piracy detection (OPD) services, watermarking is an extremely effective solution for protecting digital content. OPD provides the critical discovery phase across the global piracy landscape, rapidly collecting and identifying any infringing content. Potentially infringing content is then analyzed for a watermark, determining the source of the pirate copy, and allowing appropriate action to

Unfortunately, even with every security measure in place, the reality is content will be pirated. Therefore, it is crucial to include processes aimed at protecting content throughout the value chain. Watermarking can provide key insights, allowing for targeted business and strategic distribution decisions. \blacksquare



Miguel Bielich is the global director of product marketing for Irdeto. A commercial executive with 20-plus years of international experience in the video entertainment and broadband industries, he joined Irdeto in 2020 to drive the global product marketing activities for its media and entertainment solutions. miguel.bielich@irdeto.com @Irdeto



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BALANCING BETWEEN FAN ENGAGEMENT AND PIRACY ON SOCIAL MEDIA



ABSTRACT: The unauthorized use of IP in the form of clips, highlights, and GIFs are pervasive across social media. But is it piracy, or an opportunity to measure the marketing value, and an opportunity to monetize? It's a delicate dance between marketing teams and IP enforcement teams, on what is marketing and what's infringement. These shifting interpretations create losses as a result of a bureaucratic process that create delays in decisions, losing out either in marketing revenue or potential lost subscribers and sponsorship.

Those unauthorized clips being shared have unmined value

By James Maysonet, Former Head of Business Development, Videocites Up until now, marketing and anti-piracy groups did not need to work together lock-andstep, since company policies set the direction of how to handle user-generated content (UGC), as it related to what is deemed piracy, and what is monetized.

But, given the rise of social media and it's important in communicating information and spreading news, UGC has become a go-to choice in messaging; if a picture is worth a thousand words, then UGC video is worth a million views. UGCs can be clips of movies, TV shows, or ads, as well as highlights of a sporting event.

Many UGCs are genuine messages from fans, who are either celebrating a moment or inserting a comment to accentuate a meaning with the expectation of evoking an emotional response that would ultimately be copied, shared and viewed across the various social platforms garnering thousands of copies and millions of views. The power social media has unleashed is the significant influence of crowd sourcing, making the consumer a voice of value for products. It's estimated that Facebook and Google will share 61 percent of the digital advertising market in 2021.

So how are content owners capitalizing on these UGCs? How are they being measured to determine if they should be monetized or taken down for unauthorized use? Today they are handled by static policies, like take down any UGC longer than three

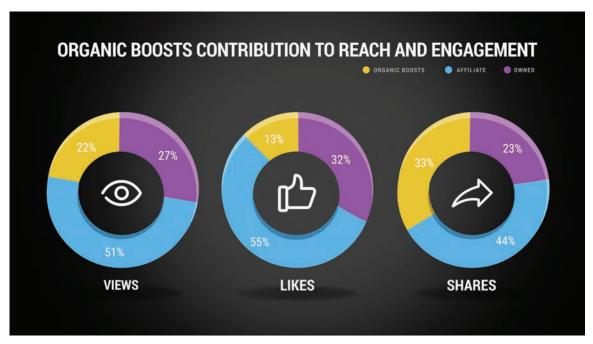


Figure 1: MediaTrack opens the ability to measure your policy and adjust accordingly, to balance between what is deemed unauthorized content, and what can be monetized.

minutes, as an example. The most common practice with short-form UGC is to forbid it and hope it forces the eyeballs to shift to the content owners' monetizing channels. This policy buries the opportunity to monetize outside the content owners' official channels, as these blanket policies do not give room to measure the media value of the fan engagement as they copy, reupload and expose to more viewers in their network. This system is not optimal, because most content owners are not capturing the value be-

cause they are not properly quantifying the exposure.

Advanced companies are reevaluating their short forms and their policies as they're beginning to see that it adds value to the brand and media, quantifying the balance, and test and evaluate what is the best policy. Because one size does not fit all. Videocites unlocks the impact of UGCs to reveal the actual fan engagement and effective media value, thus allowing rights holders to better evaluate their policies in a quantifiable and genuine way.

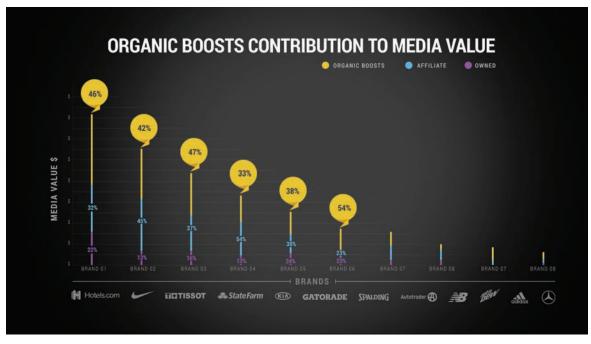


Figure 2: An example of "effective media value" and how it is increased by organically boosting content.

THE POWER SOCIAL MEDIA has unleashed is the significant influence of crowd sourcing, making the consumer a voice of value for products.

Figure No. 1 is a sample of the activities of the various highlights of a sports event and the engagement coming from the channels of the rights holder (in purple), his official affiliates (blue) and UGC/organic boosts (in yellow), which were so far unmeasurable.

Figure No. 2 shows an example to the effective media value and how it is increased by UGC that organically boosts the content.

Videocites delivers the true value of content, creating a centralized view to action within one tool reducing time lost in bureaucratic outdated manual processes and policies. Strategically burning the digital candle on both ends, now you can measure how much you want to expose to your fans and what not expose. This novel technological service was showcased at the December 2020 SprotsPro OTT Summit during the presentation "Balancing Anti-Piracy and Fan Engagement on Social." Peter Scott, Turner's VP of emerging media and innovation, joined Videocites CEO Eyal Arad in a discussion about the technology.

Here Scott opened up about the value resulting from sports leagues' use of Videocites' technology, where he validated that content owners are blind to how content is being engaged with by fans outside of their accounts: "Videocites has removed the blind spots," he said. The question of marketing teams within these content owners has been "how much is too much, how can it be measured to know when monetize, and what is piracy. Scott went on to explain how social media is an awesomely powerful platform that everyone should try to leverage, and that balancing anti-piracy and fan

engagement will be key to offering insights back to your properties. "We were missing a chunk of who was watching and how they're watching it," Scott said.

Delivered value is illuminating the potential influencers within the organic boosts, and being able to track brands and measure the value and impressions has been a huge boost to many of Videocites' customers, by capturing this very large data to identify and track where the views are happening, and how fans are engaging. This data can be shared with agencies, brands and marketers to include the previously unattainable data. "Watching the content live and where it is going and who is streaming, together with Videocites' dedicated actionable dashboard in which you can set to monetize or takedown, is a leap in the industry in managing these disparate processes," Scott said.

Developing a fan engagement-centric business model is undeniably beneficial: 65 percent of fans say they want some form of content or information at least monthly during the offseason, according to a 2020 report by Deliotte. It is equally important to protect content as social media has made access just a click away, and the rate of growth is beyond human ability to identify, track and takedown. The right technology to fit the demands is here.



James Maysonet previously headed up Videocites' U.S. based office as head of business development. An expert at re-engineering business processes and aligning practices to reflect corporate vision and mission by introducing innovative solutions, he has more than 15 years' of executive experience. contact@videocites.com



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HOW FUN AND GAMES CAN REDUCE YOUR CYBER RISK



ABSTRACT: Traditional methods of cybersecurity training don't work well, mostly because they're boring. Your team will retain more cyber awareness over the long term if they have fun in the process.

By Meera Mehta, CEO, Xcapism Learning

Picture the scene: 5 p.m. on deadline day, and you still haven't finished your mandatory cybersecurity training.

You know you have to do it, open what you've been assigned, skim through information on how to spot a phishing attempt, how to protect your data, all the rest ... and you keep hitting "next" over and over, as fast as possible. Then you guess most of the answers for the test.

You've finished for another year, and pretty much forget about it. And that's the key: how much have you really retained?

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Institute for Applied Behavioral Science, most of the traditional methods of training and awareness — from posters, watching videos, reading articles and annual training — results in as little as 30 percent retention of the information you're being given.

Not a great return on your investment, right? And certainly not helpful in reducing the risk of someone in your company clicking on a bad link or falling for fraud. Even at a live cybersecurity demonstration or event, many people will be interested, but I've seen a few people playing games on their phones.

There's nothing wrong with the content traditional methods of cybersecurity training offer. It's the delivery that's lacking. If you're not fully engaged, you don't remember as much. Which means you're unlikely to change your behavior.

The National Training Labs study goes on to say that by being immersed in a subject will see you retain up to 75 percent of the information offered. Even better, if the experience is truly engaging and immersive, you'll retain 90 percent, and be more likely to pass on your new-found knowledge onto others.

LEARNING THROUGH DISCOVERY

But how do you achieve this successfully? Think about applying a combination of gamification with "practicing doing" to your cybersecurity training, meshing the mental reward of solving gaming-like problems with a real-world challenge using everyday objects as an analogy for cyber threats.

By discovering, you're already engaged, and retaining knowledge without even knowing it. And it's important these challenges aren't a series of separate puzzles, but linked together as a story, where one puzzle leads to the next, with a goal at the end.

Think of your favorite TV drama: You're glued to

DEPENDING ON YOUR
ORGANIZATION'S CULTURE,
the tone needs to be widened to make cybersecurity
training as simple and relatable as possible.

the story from start to finish. This is what Xcapism Learning aims for with its cybersecurity training programs.

Cybersecurity awareness campaigns have generally become associated with the faceless hacker, hunched over a computer, in hiding from the law. But in reality, a hacker could be someone on the bus, someone who sits next to you at work, someone not living in their parents' basement.

Do whatever possible to help your organization rethink who cyber-attackers are. Depending on your organization's culture, the tone may need to be widened, to make it as simple and relatable as possible to appeal to your diverse workforce. Why not replace the guy in the hoodie with a cartoon crook?

Additionally, what we've found at Xcapism Learning is that cybersecurity training is enhanced when internal teams at companies compete. Playing in teams, adding a league to find the fastest time out of a cyber escape room, prizes for the best team name, all combine to heighten the enjoyment, and consequently, engagement.

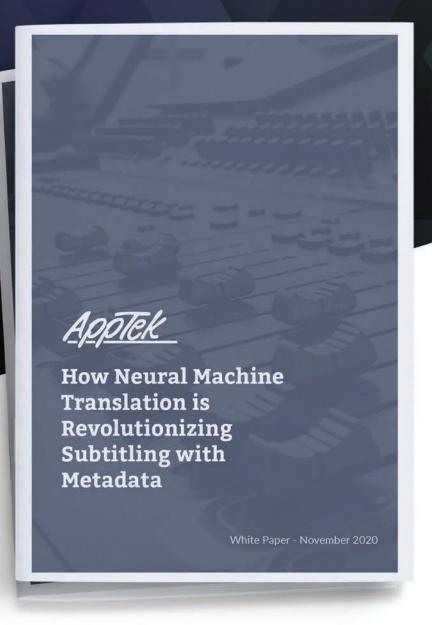
Gamification principles will lead your colleagues to remembering more, because you're more likely to remember a time when you had fun. And if you've had fun, you're building a more cyber-risk averse culture across your company.



Meera Mehta is CEO of Xcapism Learning. With a background in financial services and media, and more than 15 years' experience in the areas change improvement, risk, cybersecurity and privacy, her work has inspired Xcapism Learning's ethos of influencing real behavioral change. meera@xcapismlearning.com

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SMART CONTENT



Rights management and program scheduling. Automatic captioning and speech recognition. Data-driven decision-making to enhance content distribution, subscriber experiences and monetization. The "smart content" applications for this industry have never been more broad or impressive. The focus on gathering and applying data and the use of artificial intelligence and machine learning across systems has resulted in a significant edge for the M&E players prioritizing them.

ZOOMING IN ON SMART CONTENT

By Matt Turner, Strategic Advisor, Technologist, and Mary Yurkovic, Director, Smart Content Council, MESA



Digital strategy consultant Mary Yurkovic has more than 15 years' experience in the publishing, entertainment and technology sectors. She has been responsible for providing efficient and effective solutions for major media companies and her deep understanding of technology, content and digital workflows serves as the foundation for implementing successful solutions. She has helped companies extend their brands to the digital space worldwide. mary.yurkovic@mesaonline

org @chicagoMY

As we gathered this spring for the Smart Content Summit, a few things were different. To get together, we didn't have to brave Los Angeles traffic, wait for the valet, and find a comfortable spot at the Luxe Hotel or the Skirball Center. Instead, we just clicked and we were instantly connected with our community of data, library science and artificial intelligence (AI) nerds creating the next generation of entertainment technology.

We were still all there to talk about Smart Content, managing and connecting the data all around the content. But the changes that kept us apart have also changed how we think about that data and its impact.

Right from the start of the pandemic, data became our everyday. The volunteer-created COVID-19 dashboard (later adopted by Johns Hopkins) was a must-visit site and viewing and comparing and debating charts was everyone's favorite pastime. Forced inside, we also looked at our own data, with personal health trackers and data sites filling the void left by closed gyms and locked down neighborhoods. Data literacy and proficiency was, suddenly, just part of our lives.

Data was also behind the big shifts in the entertainment landscape. In response to the massive audience behavior changes, the digital, OTT and streamed future was accelerated. Movie release windows were rethought and big players made big bets on their own properties. Data is at the heart of all these new ventures, including, for the first time, data on consumer interaction with content.

In our Smart Content community, we've all watched as this has unfolded. And we've

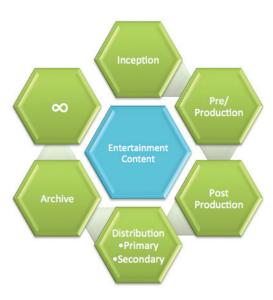
talked about how we still have a lot of work to do to deliver on these big ideas. We've talked about what kinds of data we need, how all that data flows between the systems, what kinds of data we can share, and what the limitations are of the current data tools including AI and machine learning.

AT THE SMART CONTENT SUMMIT. **WE GOT SOME ANSWERS:**

What data do we need? The closing keynote from Xavier Kochhar outlined how the big shift from technical data to descriptive metadata is key to improving the new generation of direct to consumer entertainment products. If the new platforms don't get data driven personalization and recommendations right, the users will "vote with their feet." To get it right, they need to connect user profile data, usage and user behavior data and the data on what is inside the content. With this vision, the Smart Content view of data around the content is about to get a lot bigger.

How all that data is connected? The opening keynote from Anthony Accardo of Disney laid out the case for a data-driven supply chain. Starting with a mandate for investing in data from leadership, he then outlined the steps to connect and deliver data. This includes investing in knowledge management as a dedicated resource (your DAM, CMS etc. are not knowledge management systems), creating a roadmap to connect your systems and bring data governance, not data management, to every part of supply chain operations. The result is a plan for data to be connected across the diverse system landscapes in every type of media organization and deliver the data needed for this next generation of enterTHERE IS NO DOUBT that now is the time for data in the entertainment industry. It's behind the major shifts in the industry and highlighted by the changes in how we all consume media.

What is Smart Content?



tainment products.

What data can we share? At the summit we heard from the Language Metadata Table (LMT) team. Language codes are both a great example of the data that can be shared and data that is critical for the new media landscape. Making sure everyone knows what Spanish is spoken in South America or how to code the hundreds of dialects that content is both created and distributed in is a winning proposition for everyone. Content creators, distributors, tool vendors and of course the delivery platforms all need this information. With SMPTE now managing the standard, the LMT is going to find even more applications and continue to inspire everyone to not only solve data problems, but to share their solutions for the benefit of all.

What are the limitations? Many of the sessions at Smart Content were hands-

on looks at projects. A common theme, especially around AI and machine learning, is that there isn't any magic or pixie dust that solves all your problems. Nate Adams, from Warner Bros., talked about their AI project to enhance the catalog. It couldn't be every bell and whistle, but with the right, manageable scope, they delivered real value. This community has been addressing better ways to manage and create the data all around the content for years. The practical approach we take and making sure we share what really works is a big part of why this is such a valuable community.

There is no doubt that now is the time for data in the entertainment industry. It's behind the major shifts in the industry and highlighted by the changes in how we all consume media. Events like the Smart Content Summit show just how important it is and how much more work we have to do and remind us that no matter how we gather in the future, the Smart Content community will be the right place to have these conversations.



Matt Turner is a strategic advisor and technologist helping companies deliver value from their data and content. Previously, he developed industry strategy for media at MarkLogic and worked closely with Warner Bros., BBC, NBCU, Sony Pictures and Disney and helped create the Smart Content theme. mwturner@gmail.com
@matt_turner_nyc

WHAT NO ONE IN STREAMING SERVICES IS TALKING ENOUGH ABOUT To increase average revenue per user, you better start using the data available to you

ABSTRACT: The pandemic has accelerated streaming adoption and direct-to-consumer (D2C) streaming will continue to grow at an extremely high rate. Streaming jumped 71 percent year on year in the UK and doubled in the U.S. Content providers now need to navigate a steep transition to enhance their D2C capabilities, and they can do so by leveraging data, artificial intelligence and engineering at scale, to enhance content distribution, subscriber experiences and monetization, all in order to deliver a truly differentiated streaming service.

By Giridhar Athmanathan, Engineer, Media Direct-To-Consumer Strategist

Streaming services are at a strange intersection in 2021: The clamor for direct-to-consumer (D2C) content is at an all-time high, yet the industry is more competitive than ever. Profits often remain elusive, and one reason is around issues the industry isn't talking about.

Make no mistake, there's plenty of good news in the streaming space. The market grew 37 percent in 2020 amid the global pandemic. Splashy debuts by new services grabbed extensive media coverage. 5G looms with speeds of 10 gigabits per second for our mobile devices.

Behind the good news, however, are unspoken truths. Disney+ is responsible for much of 2020's market growth. Netflix easily outdistanced its rivals when it hit the 200-million subscriber mark in January. The pure-play digital service now has 10 times the viewers of traditional media organizations. Think about it.

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Revenue alone isn't enough. Streaming services also have to be profitable. Even leading advertising-based VOD (AVOD) service providers have trouble with falling average revenue per user (ARPU) and low conversions of signups into active users.

Finding profits means stepping up to address some of the hard topics in media streaming services. 2021 is the year to launch the conversation — and to get it right:

1. Content and distribution shouldn't be a leap of faith. Media supply chains have traditionally been built to serve legacy linear distribution models. Yet agility and range are the tenets of non-linear viewership. Content supply chains are the key to enabling a flexible backbone.

Don't make the shift to D2C a leap of faith. Instead, make it a structured exercise that balances both worlds, with a bimodal approach capable of transitioning to new models while still serving traditional models. Does your organization have the ability to scale and grow, and can you accommodate increased consumption, users and loads? How efficient is your multi-platform packaging and fulfillment across linear and VOD/OTT?

As content investments continue to trend upwards, it's equally important to expand monetization opportunities with an eye on compliance. With content being distributed across multiple end-points, distribution platforms and territories, a question that should be top of mind for every media company is can our system address that complexity and utilize content efficiently with zero compliance risk?

Most media companies are sitting on huge libraries of content that they haven't begun to tap. We find that what's not being discussed are the stickier issues, such as:

- Legal and compliance risks that arise from expired rights
- Real-time updates not available during negotiations
- Unutilized value of content due to rights expiry
- Manual updates and error-prone processes

DATA IS THE OIL that runs the DTC engine. When leveraged to its full potential, it drives the metrics that matter most for streaming service providers, such as customer lifetime value, ARPU and subscriber retention rate.

International distribution enables further scale and reach to monetize content. Yet managing global rights and distribution is substantially different from standard rights management. For example, there may be existing contracts in place for original content in international territories. Streaming services need to adapt to each territories' royalties, rights and commissions.

2. If you build it, they won't necessarily come. Every streaming service has an app, but it's subscriber experience that's the make-or-break factor, especially as the "personalize everything" youth of Generation Z come of age. If you build it, they won't necessarily come — or keep coming back.

Top pain points that we see OTT product and CX teams grapple with today include user journey and navigation discord. Most are also plagued by poor search results and experience as well as limited content results and choices.

There are two ways to differentiate when it comes to experience. One is by generating recommendations that hit the viewers' sweet spot. That takes data. Leveraging the full range of data — across user preferences, consumer profiles and user journey — lets you offer the kind of experience that leads to customer stickiness.

The other way to differentiate is by making the experience seamless. Data is at the heart of this approach also. An easy, fluid CX entails design and development of personalized user interfaces, carousels, and asset presentations based on individual user preferences and customer journey maps.

3. Measure the right stuff. We see a lot of media service providers treating quality of service as table stakes



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rather than owning it and making it a differentiator. Many still rely on reactive metrics, such as how quickly a service issue was resolved. Few explore the role that an intelligent, holistic system with a view across applications, user behavior, devices and the network can play in preventing quality issues from occurring in the first place.

Letting the status quo continue is risky. By not shifting their metrics, media service providers are vulnerable to customer complaints that spill over into viewer abandonment, negative social media comments and contact center spikes during live telecasts.

The hard question not being discussed? How media organizations can take what they measure and put it into corrective actions before dissatisfaction creeps into CX. For this to happen, media service providers should prepare now to begin the transition from manual, reactive processes to a system that combines advanced data sources, artificial intelligence and machine learning-based systems and automated operations.

4. Monetization is all about the data. Leveraging audience segmentation and sharing the right content with the right audience on the right platform increases the effectiveness of both content as well as promotional campaigns. Often overlooked is the question of how effectively your organization is leveraging data to enable segmentation.

Data is the oil that runs the DTC engine. When leveraged to its full potential, it drives the metrics that matter most for streaming service providers, such as customer lifetime value, ARPU and subscriber retention rate.

Very often media service providers take a myopic view of data that resides in functional siloes such as product, marketing and promotions. They wind up leaving gaps in monetization opportunities that a unified view of the customer can provide.

WHAT STEPS DO MEDIA ORGANIZATIONS NEED TO GET RIGHT WITH REGARD TO DATA?

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ADVANCING COMMUNICATION-ENABLING TECHNOLOGIES



The pandemic has proven it's not just the deaf and hard-of-hearing who need accessible solutions

ABSTRACT: As our lives were constrained in the physical space due to the pandemic, communication became increasingly digital. The need for accessibility in these live, virtual settings has never been greater. Language technologies, such as speech recognition and machine translation, enable more connections worldwide, offering equal participation for everyone.

By Juan Mario Agudelo, VP, Broadcast, Media, AppTek

Among its many impacts, the pandemic disrupted communication for all of us. To compensate, we adopted new daily routines, and the new modus operandi for service, educational and medical industries is online or hybrid, with many companies having made the switch to the cloud permanently. Even the very fabric of our society has changed and will continue to change and adapt to modern conditions for the foreseeable future.

The new rules of the game have forced us to find new ways to communicate and coexist with other members of our local communities, including our families, friends, work colleagues, and special interest groups. A lot of this communication now happens in virtual settings in support of much-needed personal connections, or to serve core business functions that were once relegated to the conference call, or the conference room meeting space.

It's said that technology democratizes society, and if we're to learn anything from this global crisis that has, often bitterly, consumed so much time from our



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personal and professional lives, it's that we must find solutions and create positive outcomes to the new problems that have sprung up as a result of this condition.

One of the main things that became apparent during the crisis is the need for increased support in place of the visual cues we'd grown accustomed to throughout our lives. As virtual workflows and workspaces were rapidly forced upon everyone, tools were needed to facilitate online communication, and help counterbalance the negative effects of isolation, which include fatigue and the inability to focus for extended periods of time.

The rapid onset of the pandemic forced society to adapt. Development and rollout of accessibility tools in the market were pushed forward rapidly, with most major conferencing platforms now offering in-house or third-party live captioning capabilities within a year of the first lockdown announcement.

Live captions boost both engagement and accessibility. These tools are meant to help remote workers, be it to maintain a record of the many virtual conversations they've had, serve as a study guide, or to better communicate in a language other than their mother tongue. More importantly, they lower the bar of accessibility so that deaf and hard-of-hearing (HOH) individuals are able to benefit. Today, the number of deaf and HOH people worldwide is estimated to be larger than the Unites States, while in the U.S. alone more than 35,000,000 people (13 percent of the population) reports some degree of hearing trouble.

Application programming interface (API) integrations allow for multiple speech-to-text outputs in online conferencing platforms. One can now book professional captioners to provide live captioning with a short delay during a Zoom call. And in settings where professional, live captioning services are not available, or the quality requirement is less crucial, automated solutions are also available. The benefit of AI-enabled streaming automatic speech recognition (ASR) technology for captioning lies in its ability to quickly scale to meet the growing need in instances where people-managed captioning services are not available, while also offering large cost efficiencies.

The quality of the ASR technology powering the captioned text is critical, with key components being the accuracy of the transcription for a given language (including managing regional accents and dialects, as well as custom terminology); the speed (or latency) of when a word is spoken to the time it appears on screen; and its ability to identify speaker changes for a given meeting.

One of the solutions in the market today is SyncWords Live Powered by AppTek, which offers TODAY, THERE'S NO EXCUSE for a lack of accessibility or inclusivity, because it's not just the deaf and hard-of-hearing that need accessible solutions anymore.

users the possibility to add live captions to their meetings or conference calls via a professional captioner or ASR output. Now you can make conference calls with your team simply. Nobody has to worry about taking time with searchable captions made available after the meeting via transcript, in case you missed a point in a conversation or wanted to review it further. You can order automated ASR captions minutes before your meeting starts, or if you have time and some leeway in your budget, you can schedule your meeting in advance via the SyncWords platform, with the help of a professional captioner.

SyncWords Live Powered by AppTek also integrates machine translation (MT) technology, to automatically translation your captions in as many languages as the setting requires, thus truly offering a personalized experience to your meeting participants. The platform offers a unique enterprise experience, allowing for oversight of accounts and monitoring of hours. It's rights-managed, customizable, and captions can be launched within a minute of scheduling an event.

Today, there's no excuse for a lack of accessibility or inclusivity, because it's not just the deaf and hard-of-hearing who need accessible solutions anymore. We all do. As our lives have become more constrained within the physical space, communication is becoming increasingly digital.

ASR and MT technologies are becoming the enabler in the dawn of a fully online and connected society. \blacksquare



Juan Mario Agudelo is VP of broadcast and media at AppTek. With more than 13 years of experience as a sales and marketing executive helping pioneer the closed captioning and space, he has actively participated in an industry that has quickly moved from steno, to re-speak, to ASR. juan@apptek.com @apptek_mclean





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IS AUTOMATIC CAPTIONING GOOD ENOUGH TO REPLACE TRADITIONAL CAPTIONING SERVICES?

The future of automatic speech recognition technology is bright, despite its current drawbacks



ABSTRACT: Automatic captioning is on the rise. But is it really good enough to replace traditional captioning services? A look at the ways Red Bee Media has embraced caption automation, and why a little experience goes a long way when it comes to getting the most out of automatic speech recognition.

By Juliet Gauthier, Strategic Product Manager, Access Services, Red Bee Media I've been watching "Humans" on Netflix. A couple of years late, admittedly, but if lockdown has been good for anything it's catching up on TV shows you didn't notice the first time around. The premise is a good one: humans have created synthetic versions of people to do various jobs in society to make the lives of the real humans easier and more efficient. Because this is TV, stuff happens that asks the viewer to question how capable we are of managing the rise of automation in our day to day lives.



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YOU'RE NEVER GOING TO get the best out of automatic speech recognition unless you combine the latest technology advances with every bit of your human expertise.

Automation is something that I deal with every day as a product manager in access services at Red Bee. Access services is a collective term for anything that provides viewers with greater access to media content. Think captioning for hard-of-hearing and deaf viewers, or audio description for partially sighted and blind audiences. We've been providing these services for decades to many of the major global broadcasters in our industry and, like any company that's been around for a while, we've observed and adopted new approaches to our service delivery by taking advantage of technological improvements that emerge. In recent years, the big trend has been the automation of speech-to-text solutions for captioning workflows.

We've used speech-to-text systems for 15-plus years to produce captions for broadcast content. The process is quite simple: broadcaster audio comes in, gets translated into text, text is converted into captions, and captions are sent back to the broadcaster for transmission. In the past, people would assume that you could just plug the audio into a computer, and it would generate captions automatically for you. Yet it was never quite that simple.

Computers weren't great at knowing people's names, or when to punctuate at the end of a sentence so, traditionally, a trained live captioner would need to act as a kind of interpreter, repeating the audio into a speech recognition system trained on their voice, punctuating as they went, and speaking in a kind of robotic monotone to ensure the computer transcribed each word correctly, often live on air. It's incredibly skillful, intensive work. The limited group of people who can do this job well are genuine experts in handling speechto-text systems.

In the last few years, though, there's been an explosion of automatic speech recognition technology. You can ask Alexa to tell you a joke, or get Siri to tell you the weather, and these advances in speech-to-text automation have benefited captioning workflows as well.

Suddenly, we have automatic speech recognition (ASR) engines that know when to put a question mark at the end of a sentence, or how to use phrasal commas. They can transcribe newsreaders almost flawlessly. They're trained on millions of hours of audio and recognize terms like "COVID-19." Combine the best ASR engines on the market with the best captioning toolsets developed by Red Bee, and you have an automatic captioning solution that's accurate enough that you can actually put it on air without needing that trained live captioner to act as an interpreter.

Before we meekly accept the rise of our automatic captioning overlords, it's worth noting that there are still weaknesses in ASR. While it's much better now at understanding how to punctuate, it can be pretty terrible at working out when a new person is speaking. This makes watching an interview quite hard work if you need to use captions. ASR engines also don't do a great job yet identifying non-verbal sounds, like music or applause. They work best on content where speakers say things in full sentences, with limited background noise, because this gives the engine a lot of context to understand the structure of a sentence and more chance of accurately transcribing it. So, using ASR for captioning news programs works great, but when applied to sports content — where sentence fragments, like saying a player's name, are common, and where there is a lot of background noise — the result is usually far from excellent.

Finally, ASR engines are fundamentally still quite dumb. They know what they've been taught, and they don't learn without some sort of human intervention. So, you must teach them new terms if you want them to transcribe them accurately. For news content, with new names and places cropping up every day, several times a day, this is a risk that a captioner just wouldn't experience.

Continued on Page 156



Juliet Gauthier is strategic product manager of access services for Red Bee Media, and has worked in accessibility services for the media industry for more than a decade. She started out as a live captioner and operations manager in the UK, before moving into global program delivery, where she established Red Bee's first operational excellence team and flagship U.S. site. juliet.gauthier@ericsson.com @RedBeeMedia



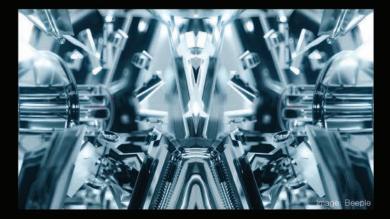
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ABSTRACT: The integration of artificial intelligence-based tools with rights management and program scheduling technology has created new, extraordinarily beneficial opportunities for greater cataloging, utilization, and monetization of content. Rights management — which can be a simple as excel spreadsheets or one-sizefits-all, single-instance/multi-tenant solutions, to more advanced solutions required for large, global media enterprises — is no longer about simply running an availability report informing what can you do with your content. It's about what should you do with your content.

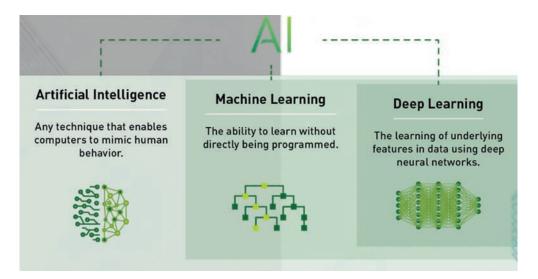
By Shiv Sehgal, Chief Product Officer, RSG Media

Artificial intelligence (AI) is branch of computer science focused on building smart machines capable of performing tasks that typically require human intelligence. AI is an interdisciplinary science with multiple approaches, but advancements in machine learning and deep learning are creating a paradigm shift in virtually every sector of the media and entertainment industry.

Executives who ignore how the combination of AI and rights management is already revolutionizing media do so at their peril. More the 40 percent of larger M&E enterprises have leveraged AI in some way, a 270 percent increase in just the past four years, according to studies by PricewaterhouseCoopers and Deloitte. The results startle.

The revolution started small, with media management and editing, where an abundance of repetitive tasks was conducive to automation. Catalog and metadata management practically became real-time, thanks to AI's ability to process vast amounts of data accurately and intelligently. Today, AI-based analysis tools support

What is Artificial Intelligence?



live productions, such as news broadcasts, forecast audience, drive content acquisition and programming decisions and more. RSG Media has witnessed our clients using our tools to drive significantly higher revenues from their media value chains, while shifting resources from mundane to strategic tasks.

THE CATALOG

AI-enhanced media library search is critical for financial success. It sifts through mounds of metadata in a twinkling, helping find precisely the right newsclip to air or content to sell. As companies add complexity — new metadata fields, new channels of distribution — AI accurately assesses what to sell, where, when, and how. It works in tandem with advanced availability engines, aligning search criteria with asset availability. It instantly adapts the search to each user's needs, reporting in real time what previously took days. It reduces and refines the scope to the most relevant, and profitable results. When combined with rights management and program planning, one can even train the AI system to constantly evaluate the library against known variables and create a sales strategy that optimizes revenue.

Specific segment retrieval is the ability to find the right segment, for the right deal, for the right customer or daypart, whilst maximizing revenue has become a core requirement when assessing rights management and program scheduling systems. Rights management

systems that leverage AI let end users perform advanced content analysis: quickly assessing all the content in their asset management system to select the content that precisely meets specific rights and clearance parameters, coupled with an optimized availability report.

The integration of AI-enabled rights management tools with content management systems makes faster, greater monetization of available media possible. Integrating AI-enhanced rights management tools with editing solutions lets users seamlessly create and clear new versions and promotional video clips for news, sports, movies or TV series, quickly seizing new revenue opportunities. AI-enhanced rights management tools also grow revenues by identifying and proposing sales strategies for overlooked markets and channels.

MANAGING THE DETAILS FOR FASTER CLEARANCES

Media contracts are notoriously complex. For example, for foreign language versions, many A-list talent contracts contain clauses requiring voiceover approval if the film is dubbed. Or, the content itself may require editing/moderation, depending on local laws or cultural dictates. AI coupled with rights management software quickly assesses language, sentiment recognition, image, and object analysis to allow distributors, sales engineers, editors, and others to scan content and



Shiv Sehgal helps the world's leading media companies adopt new business strategies. He's responsible for RSG Media's Audience Platform, a cloud-based AI-decision-making platform for media and entertainment companies, allowing them to decode data for insights across content, marketing and advertising inventories. shiv.sehgal@rsgmedia.com @SSehgal_RSG

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flag anything that might require specific approvals, release forms, edits, etc. This in turn leads to a stronger media value chain, improved customer relationships and faster monetization of the content.

RSG Media's clients use our machine learning and artificial intelligence to accelerate content monetization by discerning new channel strategies to efficiently and fully exploit their available content. They accomplish this by using the full computing power, data analysis, and algorithms embedded in our rights solutions. We pioneered technological advances in AI/ ML that make it possible to find new revenue in previously unachievable ways and give our clients a more holistic and comprehensive view of their intellectual property, whether that IP is music, games, streaming content or consumer products. This comprehensive rights assessment and capability to run advanced avails reports actually protects and encourages innovation and creativity with that IP.

AI IN THE BROADCAST INDUSTRY

Understanding your rights and avails is part of the work for a broadcaster. More important is knowing what to air when. Our Program Schedulers clients at major global media companies tell RSG Media that our tools augment the human aspect of scheduling, adding insights from advanced avails calculations, historical performance data, and consumer preferences to ensure an optimized line up. They say it makes them more efficient at preparing new schedules, reviewing existing ones, and, most importantly, optimized schedules based on competitive analysis. The benefits of combining rights management and program scheduling software with AI, enables the system to think, learn, and perform tasks that would normally require human engagement and intelligence. Rights optimization and

schedule optimization are just two ways that media companies leverage AI.

FORECASTING AND AD SALES

RSG Media's clients reports net new revenue measured in tens of millions of dollars, because AI forecasts ratings brilliantly. Machine learning (using algorithms and statistical models, patterns and inference) makes it possible for RSG Media to predict ratings for a particular show up to three weeks in advance, with a high degree of accuracy. This lets programmers optimize their schedule and sell ads against that optimized schedule, with a huge upside for audience and better targeted demos.

AI-driven insight moves users from "what can I air?" to "what should I air?" It enables a fusion of scheduling, based on integrated rights and avails, and ad sales. To sift, collate, and corelate the massive amounts of rights/ avails information, historical data, performance statistics, competitive schedules, and consumer sentiment is impossible for humans. But machines can do it. Machines can, and have, improved the scheduling process and decision making, reduced time and improved accuracy and efficiency.

CONCLUSION

The media landscape is about to be littered by the stalled careers of executives who ignored the magic combination of AI plus rights management. RSG Media's clients have already demonstrated the power of layering AI on top of rights management, better protecting, programming, acquiring, promoting, and monetizing their media assets. Nascent AI tools promise an even greater shift.

Given the importance of rights management and data analytics, RSG Media continues to research, invest, and develop new protocols for leveraging AI to meet the growing industry demand. **H**

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Change is an integral part of both the technology and M&E industries. Today's enterprises must be ready to respond to new opportunities, new challenges, and new technologies with increasing speed and agility, often with IT resources already stretched beyond capacity. That's where we come in.

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UTILIZING MODERN ANALYTICS TO DRIVE STREAMING SERVICES REVENUE



ABSTRACT: As the media and entertainment industry transitions to a streaming-first

By Jim Whelehan, Senior Account **Executive, MicroStrategy**

Whether you're an established streaming provider, or a start-up looking to go over the top, there's only one data analytics platform that can deliver the myriad of features and capabilities your streaming service now requires. And given the recent headlines it's been generating with its treasury strategy (it was the first public company to adopt Bitcoin as its primary treasury reserve asset), it shouldn't surprise you to learn who it is.

MicroStrategy is the proven data solution for streaming services organizations. The company has a rich history of pioneering solutions in enterprise intelligence, and it is uniquely positioned to help streaming services organizations optimize and grow their business.

In February, at our annual MicroStrategy World user conference, the keynote address featured a unique solution from Disney-ABC Television. The media giant uses the MicroStrategy platform to deliver its "newsroom of the future." To ensure its media consumers are receiving the most relevant and compelling content, Disney-ABC Television recognized that agile newsrooms need both accurate, real-time data, as well as historical data, to serve as a benchmark. Its solution merged historical and real-time media consumption data to create actionable insights using MicroStrategy reports and dossiers.

The Disney-ABC use case is one application of how MicroStrategy empowers data-driven organizations in this industry. Here's how it can help transform your streaming service:

Break down siloes and use all of your data. MicroStrategy is able to harness the full power of enterprise data because of an open architecture that embraces data of all forms. With more than 200 native connectors, and a robust set of APIs and SDKs, streaming organizations can easily access multiple data sources such as customer engagement records, social media feeds, and Nielsen data.





These are challenging times. Streaming should be easy.

Testronic Film & Television expertise sits behind the launch of OTT platforms across the globe. Our specialized teams not only test your content that streams on platforms, but also tests your code, user interface, and user experience to ensure you deliver an exceptional quality of experience to consumers, and continue to win them over time and time again – whether they are watching on their mobile phone or the TV in their living room.

Contact us to learn more about how to reduce potential risk and ensure your content gets delivered flawlessly.



IN THE ENTERTAINMENT INDUSTRY, success was once defined as \$1 billion for a theatrical release. That's changed. New metrics are emerging that will transform the industry, and the ability to accurately analyze and visualize data is a cornerstone in today's streaming world.

■ Deliver 360-degree views of user behavior. In the entertainment industry, success was once defined as \$1 billion in theatrical release — but that's now changed. New metrics are emerging that will transform the industry, and the ability to accurately analyze and visualize data is a cornerstone in a streaming world. Minutes streamed, click counts, user journey, and device preferences are what matters now. Having ready access to new streams of data, and the ability to leverage predictive analytics is critical to thriving in the streaming wars of 2021.

Armed with audience insights, organizations learn how their users view content across platforms, devices, apps, and locations. MicroStrategy's Enterprise Semantic Graph ensures that your organization gets the trusted analytics you need on viewing habits, allowing you to optimize subscription management, revenue channels, and new content acquisition.

Harness insights to ensure continuity. Armed with engagement insights, organizations can quickly identify, understand, and resolve issues before they hit the broader audience. MicroStrategy's predictive analytics provides the diagnostic capability as well as the alerting system to ensure a rapid response from key personnel.

Speed kills — so work 10 times faster than the competition. The ability to analyze high volumes of real-time, streaming data requires an enterprise platform that's built to scale. MicroStrategy was architected for this precise ability, able to effectively deliver big data analytics on billions of rows of data.

Empower your people with (trusted) data discovery. Streaming services have changed how users acquire information and consume entertainment. Your organization deserves a solution that's equally agile. Give your analysts an intuitive user interface, unique collaboration capabilities, and drag-and-drop functionality so that they can quickly build and deploy reports and dossiers to run a better business. And know that the conclusions they reach are based on trusted data because everyone across the organization operates using a single version of the truth.

- Dotimize opportunities for licensing. Does your data show that paying high licensing fees for content is worth it? Learn where investments can be optimized and harness the power of advanced analytics and AI to present the right content, to the right audience, at the right time.
- Trust the platform with a proven track record. MicroStrategy already works with one of the industry's largest streaming providers, helping it better understand user behavior on its media platform. With the granular ability to better understand their customers, this leading streaming organization is positioned for growth: capable of exploring emerging trends and delivering value-added recommendations for advertisers.
- Make your team hyperintelligent. In 2019, MicroStrategy released a new product that fundamentally transformed an organization's ability to be insights-driven. Hyperintelligence seamlessly delivers answers, insights, and one-click actions in the websites, business applications, and devices people already use every day to do their job.

Hyperintelligence presents the opportunity to address countless use cases in the media and entertainment industry, as it ensures that, 1. Everyone across the enterprise has access to a single source of the truth, and 2. Everyone can access this information simply by hovering over underlined words in the systems and applications they work in. Whether it's real-time information on specific projects, products, people, locations, or properties, hyperintelligence is the proven enterprise-grade solution that's now available in a SaaS offering. \blacksquare



Jim Whelehan is the media and entertainment sales leader for MicroStrategy. He has been responsible for managing this vertical for the last 15 years and has helped clients with many of their business intelligence, predictive analytics, mobility and big data challenges.

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ABSTRACT: Blockchain non-fungible tokens (NFTs) have emerged as a new medium for creators, studios and brands to connect virtually with their fans. From digital collectibles to open world gaming experiences and augmented reality, NFTs are creating an open, diverse platform for exchanging virtual experiences that will revolutionize the economics of the M&E industry in a post-COVID-19 world.

By Phillip Gara, Director, Strategy, OTOY, RNDR and Jayson Kleinman, Project Manager, RNDR

Over the past few months, blockchain non-fungible tokens (NFTs) have rapidly moved from its incubation period within the community of crypto artists and developers into one of the biggest cultural phenomena of the early 2020s.

NFTs, which attach unique blockchain verified tokens to digital goods, are revolutionary because they provide the first widely available mechanism for enabling provable ownership for digital content. With NFTs, all of the cultural production enabled by the Internet can be monetized as single or editioned items — with a token attached to each uniquely owned digital asset. The reaction to this simple but groundbreaking innovation has been overwhelming. As of February, Dapper Labs' NBA Top Shots NFT platform has recorded over a quarter of a billion dollars in sales, 3D artist Beeple's \$69 million dollar Christie's NFT auction sale placed it in the top-three ever recorded for a living artist (adjusted for inflation), and anonymous artists Pak's upcoming NFT auction at Sotheby's has garnered

NOW IS THE TIME to get serious about incorporating NFTs into your strategic roadmap, especially for media and entertainment organizations looking to adapt to the emerging opportunities of the post-COVID-19 landscape.

front-page news in the world's leading art publications.

NFTs have also quickly moved from an initial use case in graphic art to all forms of media, entertainment and culture. Time Magazine has auctioned three single-edition NFT magazine covers on the crypto art platform SuperRare, MVP NFL quarterback Patrick Mahomes released limited edition NFTs on the platform MakersPlace, and Jack Dorsey tokenized and sold his first tweet as an NFT raising \$2.9 million for The Give Directly Africa Fund. Par for the course in almost any major 21st century societal transformation, Elon Musk released a 3D-rendered NFT trending for days on Twitter, many prominent musicians are now including NFTs in their album and concert releases, and clothing brands are now producing limited edition NFTs.

To some, the current moment resembles the 2017 cryptocurrency and initial coin offerings (ICOs) boom, which was swiftly followed by the collapse of many projects and a nearly two-year "crypto winter" before this year's resurgence. NFTs — which provide a token of digital ownership for virtual goods like an image, video, game, song, publication, or collectable using a blockchain smart contract that registers the provenance and sale data in an open and shared database — are also still an abstract concept for many. However, now is the time to get serious about incorporating NFTs into your strategic roadmap, especially for media and entertainment organizations looking to adapt to the emerging opportunities of the post-COVID-19 landscape.

Not only are NFTs here to stay, but they will be-

come more powerful as digital transformation accelerates and the next generation of augmented reality and holographic media technologies move from R&D to mainstream adoption. Due to the open and participatory nature of the technology, NFTs also present a remarkable opportunity to increase diversity within M&E organization's pool of creators. The technology also is not zero sum, providing an avenue where digital transformation does not necessarily lead to the corrosion of existing revenue models. To the contrary, NFTs can be a powerful tool in augmenting both digital and physical product offerings. This article will survey some of the trends and opportunities for M&E brands we see in the fast moving NFT landscape.

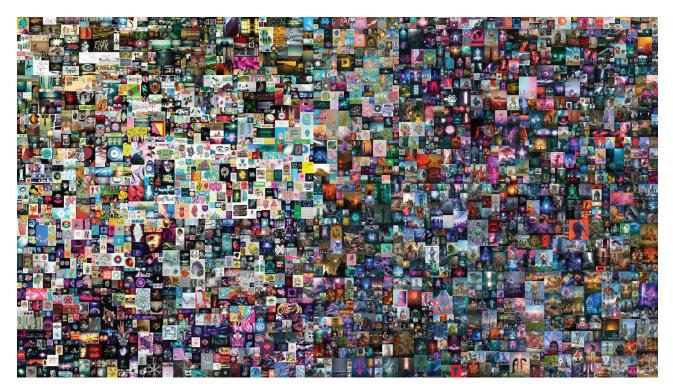
At OTOY, we have witnessed the remarkable rise of NFT first hand as users of our OctaneRender software and RNDR blockchain network have become lead adopters of cryptoart, accounting for over a quarter of a billion dollars in primary and secondary market sales already this year. Users of OctaneRender like Beeple, pioneer of social media #everydays for over a decade, and Pak, the anonymous creator of the algorithmically generated social media feed Archillect, have become faces of the NFT movement as a result of front page sales at the world's leading art auction houses Christie's and Sotheby's. Behind the headlines, across our community of motion graphics and visual effects artists, NFTs are accelerating the democratization of professional content creation and providing new channels for digital artists to develop their careers. Cornelius



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"Everydays: The First 5000 Days"

Dämmrich, the creator of the iconic OctaneRender 3.0 splash screen "52hz" recently sold the work for more than \$150,000, providing a revenue model for his meticulously produced 3D art where none had existed for years.

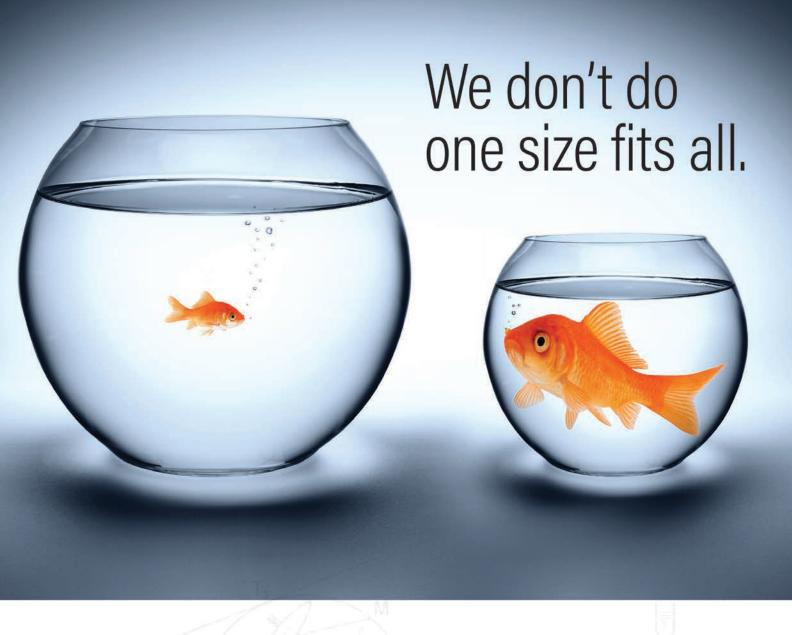
Female artists like Blake Kathryn and Smccea have emerged as leaders in 3D cryptoart, and NFTs have also provided the first global platform for artists to sell their works, leading to increased opportunities for creators in emerging markets to monetize their works. Finally, we have seen collaborations between 3D artists and a diverse set of musicians, filmmakers, photographers and performers to co-develop NFTs that cross artistic, geographic, and racial boundaries.

There are a number of reasons that NFTs have continued their accelerating growth, rather than quickly burning out. The virtual economy developing in the shadow of COVID-19 has catalyzed new forms of interconnection that are likely to persist even in a post-pandemic environment. Notably, unlike traditional art and goods, which are difficult to trace after the initial sale, NFTs enable creators to get royalties from secondary market sales because provenance, royalties and transfer data is encoded in blockchain smart contracts. As a result, NFTs incentivize continued value creation by their design, where the royalties from secondary sales can quickly dwarf primary market revenue. Brands can use this royalty structure to release NFTs

that help generate value and engagement with their fan base, increasing brand equity and loyalty as the demand for content grows. NFTs are also programmable, with creators able to build on top of existing works — for example, attaching future entitlements to NFTs like unique smart contract tokens that provide early access to product and merchandise sales, limited edition items, or future events. Finally, and most importantly, there is a near unlimited basket of virtual goods which can now be monetized using NFTs — ranging a spectrum from popular memes and tweets to iconic frames from films or TV shows, all the way to attaching unique digital goods to live event tickets, apparel, and advertising

There are still a few challenges that need to be addressed before NFTs go mainstream. Currently, verification tools are less than perfect, and there are few ways to prevent copyright infringement, IP theft, or even copying and re-releasing the same NFT on multiple platforms. This is all currently left up to NFT marketplaces to police, which — as we have seen with social media platforms — can produce mixed results. Second, blockchain technology needs to advance to new consensus mechanisms — i.e. ways that the shared blockchain database is maintained — that go beyond initial proof-of-work cryptocurrency mining protocols, which generate tremendous environmental waste, long

Continued on Page 158



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By Chris Reynolds, EVP, GM, Localization, Fulfillment Services, Subtitling Operations, Deluxe

The competition for subscription and ad-supported streaming viewers has never been more intense and looks to remain so for the foreseeable future. Netflix and Amazon are facing increased competition in the marketplace from the fast-growing Disney+ and its recently launched Star adult-centric offering, as well as from Warner Media's HBO Max, Comcast's Peacock, Apple TV+ and Viacom's Paramount+.

A global presence in both penetration and programming are seen as revenue drivers in the streaming space and Netflix, Amazon, Disney, Warner Media and Apple have recently made big commitments to local language productions as part of their upcoming slates of original programming.

Retaining subscribers who have so much choice is a challenge facing all streaming platforms. A survey published by Deloitte earlier this year found that 46 percent of respondents who subscribed to streaming services had cut at least one in the prior six months. To be globally competitive means that in addition to being affordable, providers must serve up a broad array of programming unavailable anywhere else.

This kind of demand for content has created a new market for acquiring global rights to entire film and TV

catalogs and libraries, as well as increased spending to develop original, local language productions that will perform well across multiple territories. A recent cursory look at one major streaming platform revealed that nearly half the content on its U.S. site is non-English. As the fight for subscribers grows with each passing month and new services are either launched or expanded into more territories and languages, the quest for a quality globalized viewing experience will be a primary differentiator for consumers.

THE FUTURE STATE

The power of technology has increased exponentially, and is more accessible than ever thanks to cloud computing and rapid advances in artificial intelligence and machine learning platforms. New machine translation, automatic speech recognition (speech to text) and native language processors are becoming more integrated into globalization service and distribution platforms. All are inevitably part of the future of localization and there are undeniably exciting innovations on the horizon.

In addition to leveraging technology to help create localized content, algorithms derived from consumer

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BUT FOR ALL THE BLEEDING-EDGE TECHNOLOGIES, today there are still very real limits to what machines can localize, and major supply chain dynamics that would make the distribution of different video versions that perfectly match foreign language audio incredibly challenging.

behavior will be used, instead of baked-in settings to determine if a viewer prefers content in one language dubbed vs. subtitled for another, making determinations from data based on location, gender, and age and viewing history. Additionally, audio technology is advancing so quickly that we're already seeing initial attempts to replicate an actor's voice from his or her native tongue into any language needed. With additional development, visual effects augmentation for lip movement will reach the point that foreign language versions can be created with such precise lip sync that you won't even know that it's a dub. Naturally the cost to create and distribute dubs with this level of sophistication will be expensive at the outset, but it will be possible at some point in the future.

But for all the bleeding-edge technologies, today there are still very real limits to what machines can localize, and major supply chain dynamics that would make the distribution of

different video versions that perfectly match foreign language audio incredibly challenging.

For both subtitles and audio dubs we have to get a creatively accurate translation. There are still significant aspects of language and storytelling that machines just can't decipher properly. We experience this every day with the inaccuracy of our smartphones and devices when we use voice commands or speech to text. It's further evident when you use machine translation and find that sometimes even the simplest sentences just don't come out right. While machine translation can be a very useful translation aid, and can be particularly helpful for short and simple literal translations, it can't

yet match the nuance and creativity needed for entertainment content.

Linear media content is time-constrained, requiring translations to be precisely summarized and contextualized to maintain readability. When reading subtitles, the viewer needs to be able to read while simultaneously taking in the picture and sound to have a truly immersive experience. With dubs, the translations also have to be adapted to match the original actor's lip sync. Creative intent is where it gets really complicated. Literal translations don't always convey the emotional intent of the content. Skilled media translators have to consider the meaning and truly re-write lines to ensure that they will resonate with audiences in another language and culture. Only human intelligence can fully understand how to convey depth of emotion through the twists and turns of colloquialism in storytelling while fitting into the technical constraints of subtitling and dubbing.

PROVIDING QUALITY AT SCALE

Having a broad menu of available entertainment programming from around the world is wonderful, but only if it's a satisfying and immersive viewing experience. Non-U.S. audiences, especially in France, Spain, Italy and Germany, have long accepted dubbing as a way to consume international fare, while other countries tend to prefer subtitles. More and more, whether through a default setting or simply increased exposure and acceptance, US streaming audiences are watching dubbed content — and not always to rave reviews. An

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Chris Reynolds has more than 20 years of media and entertainment experience in postproduction, localization, media supply chain, operations, personnel management, process, and product development. He is passionate about solving industry challenges through collaboration, innovation and process improvement. He oversees Deluxe's worldwide localization and platform and fulfillment teams, who are responsible for localizing and delivering content to the world's largest digital platforms, channels and theaters in over 80 languages. chris.reynolds@bydeluxe. com @deluxe1915



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NEW WORKFLOWS



Media and entertainment's pandemic-forced changes resulted in the adoption of new workflow technologies, resulting in a fundamental shift in how we manage the infrastructures and processes around our productions and operations. Increased acceptance of multi- and hybrid-cloud services, the embrace of new storage architectures, the rush to find just the right SaaS solutions for our needs ... the industry's vendor community has met every challenge and demand the content community has thrown its way.



By Stephen Tallamy, CTO, EditShare

ABSTRACT: In 2020, the industry coped with massive, enforced change, but was successful in embracing new technology by shifting to cloud and virtualized environments, changing the dynamics of TV content production. The most recent cloud and virtualized environments can enhance productivity for content makers and feed the ever-increasing demands from streaming and OTT services.

In order to understand how production in the cloud works, it's important to take in the big picture. The term "cloud" came from the quite correct assumption that, as a user, it is a "cloud" of technology that provides services that you can assume, without having to get involved in the nuts and bolts, and, just like real clouds, they're not bound to a single location. Storage in the cloud is real storage, and cloud compute resources are real computers. So, it's possible to run even the most demanding of post-production processes in the cloud.

The very rapid — and necessary — pivot to remote working has moved the cloud industry forward five years or more in terms of adoption. From the perspective of a cloud-focused company like EditShare, while it would be disingenuous to claim that it had been planning for a pandemic, it would be fair to say that it was planning for the cloud, and this health emergency, at the very least, has been a very good proof of concept.

Another of the cloud's silver linings is that it is immensely flexible, able to scale up and scale down to suit the often rollercoaster-like needs of the production industry. This shape-shifting ability lets producers try out new and potentially risky workflows

without a massive capital outlay and makes a safer, more fertile territory for creative ideas. It makes it easier for production heads to give the "go-ahead" for pilots and confers longevity to those series burdened by hard infrastructure costs.

Cloud production isn't mass market yet but increasing numbers of successful users and their productions are moving it in that direction.

FIVE REASONS WHY THE POST PRODUCTION INDUSTRY WILL EMBRACE THE CLOUD

- 1. Cloud technology is maturing: The obstacles that existed when the cloud swung into action over 10 years ago are melting away or becoming irrelevant.
- 2. The industry is changing in the direction of the cloud: Ever since film gave way to files, the benefits of cloud production have beckoned. The cloud doesn't just repeat what happens on firm terrain, it improves it and sometimes makes what was previously impossible, possible.
- 3. Tools and technologies are emerging that can ease the transition from on-premise to cloud: As much as work is progressing to improve the scope and scale of the cloud, developers are also focusing on hybrid cloud methodologies. This eases the transition to the cloud by removing the "all or nothing" debate about whether to embrace cloud production.
- 4. 5G and satellite connectivity increase ubiquity and lower latency: 5G is much more about infrastructure than cell phones. It's about rock-solid, high bandwidth connectivity and extremely low latency (potentially less than a frame with an edge server). It will be like a LAN connection. Perfect for post-production. Satellites will ensure that this type of service is available anywhere (literally anywhere) on the planet.
- 5. The results are in: the cloud increases productivity and accessibility: People can work from anywhere. With smart proxy technology there's no need for powerful servers near every editor. Faster results. No need to manage your own air-conditioned racks of servers on-premise. Instant scalability. Productive remote working. It also boosts accessibility and diversity for a wide cohort of users, some who might be geographically remote and some who might not be able to afford the sort of equipment you'd need at home to compete with a facility.

THE VERY RAPID — and necessary — pivot to remote working has moved the cloud industry forward five years or more in terms of adoption. It's immensely flexible, and able to scale up and scale down to suit the often rollercoaster-like needs of the production industry.

FIVE WAYS THAT TECHNOLOGY IS OVER-COMING THE FINAL OBSTACLES TO UNIVER-SAL ADOPTION OF THE CLOUD

- 1. Proxy editing: Until ubiquitous high bandwidth is a reality, proxy editing is the practical approach to production work in the cloud. High-quality, detailed and frame-accurate proxies can seamlessly substitute for full resolution files, allowing all but the most visually critical work to be done remotely and without expensive workstations on site.
- 2. Close integration with existing non-linear editing systems (NLES): NLES that don't have a remote and collaborative ability built in can interface with cloud services through "panels" and "workflow integrations" which act as a portal into cloud services. To users, it's just an extension to their familiar interface that brings the power of the cloud directly into their NLES.
- 3. What used to be an on-premise media optimization software is now a layer that can be run as efficiently in the cloud as on the ground: Nobody has to be concerned that cloud storage is "generic," with

Continued on page 167



Stephen Tallamy is CTO of EditShare. He works closely with globally distributed engineering teams setting technical direction, advocating best practice, driving quality improvements, and defining the approach for selection and adoption of new technologies. stephen.tallamy@editshare.com
@StephenTallamy



ABSTRACT: Media workflows have gone through tremendous transformation with traditional infrastructure and processes giving way to virtualized operations using cloud compute and storage. Valuable media assets, however, still need to be secured for long-term preservation. With thoughtful planning, hybrid storage architectures can be deployed so both active access and managed preservation can be achieved.

By Linda Tadic, CEO, Digital Bedrock, and Whit Jackson, VP, Technology Alliances, Media, Entertainment, Wasabi Technologies

Media workflows have gone through tremendous transformation with traditional infrastructure and processes giving way to hybrid operations blending on-premise compute and storage hardware with cloud services. Cloud storage, in particular, has assumed a far greater role in professional media operations where the data sets generated by high resolution cameras and VFX work have grown exponentially in recent years requiring additional storage capacity. But hybrid storage architectures are not just limited to the front-end production stages of media, they also play an important role on the back end where long term preservation is the goal.

MANAGED DIGITAL PRESERVATION

In the analog film and videotape-based era, media companies knew how to manage their assets. Physical film and tape masters were locked in vaults, and industry guidelines outlined required actions to ensure the safety of the company's intellectual property. Studios retained experienced archives staff to keep their valued assets alive through film restorations, and reformatting videotapes from obsolete video formats to "new" video formats — that then became obsolete.

Digital assets still need to be managed, restored and reformatted as it was before with



AS WITH ANYTHING in the media world, change and technological evolution is an ongoing reality. Yet the need to preserve valued digital content, in any medium, is of critical importance for perspective and appreciation. As the archival adage says, 'Preservation without access is pointless.'

film and tape. Nothing has changed as far as the core concepts in preservation work. However, the technologies to manage and perform preservation actions on valued content have evolved, requiring a different kind of diligence. Digital preservation requires monitoring and mitigating the digital object obsolescence itself, the health of the data, and storage media migrations. Digital preservation must be managed — storage is just one part of an overall digital preservation strategy.

Digital object obsolescence. Digital formats can become just as obsolete as the familiar videotape formats from the past. Revising and updating computing and storage devices is a necessity as technologies improve, but legacy content manifested as digital objects become endangered when the software, operating systems, and hardware required to render a file become unsupported as new technologies are developed. In order to monitor obsolescence vulnerabilities, content owners must know the technical characteristics of the digital objects and files in their collections, and what software, operating systems, and hardware are required to keep that content usable. Digital object obsolescence is separate from storage media obsolescence (for example, data tape, hard drives, and file system obsolescence).

Bit health and fixity checks. Digital objects are bitstreams contained in formats. A central principle in digital preservation is to verify that the bits are still "fixed" and unchanged over time. Readers might be familiar with the term "checksum," and if so, most familiar with the md5 checksum. Broadly speaking, a "checksum" or "hash" is an alphanumeric value

generated by a mathematical algorithm. The output, or hash value, should be unique to a particular file. There are several types of hash algorithms, with SHA-512 considered the most secure in common use (e.g., its complexity makes it more difficult to hack or spoof). Regardless of the algorithm used, digital content should be checked according to a schedule over time to verify that the file has not changed. In digital preservation language, this process is called a "fixity check." If a file is retrieved in five years and a "fixity check" run against its original checksum or hash, it should be the same. If it is not, then something has changed in the file.

How often fixity checks are run depends on how the files are stored. This article does not have space to delve into the different methodologies of fixity checks in object storage in the cloud, versus checks on standard file-based server storage, or checking files on data tape. The main point to stress is that checksums/hashes — the unique "fingerprint" — should be generated the moment when a file/object is finalized, and then verified according to a schedule over time.

Media migration. Data is stored on something, whether spinning disks, solid state drives, or data tape such as LTO. Locking storage media in vaults behind a series of physical barriers and several layers of authentication is a strong method to protect digital content from unauthorized use. Of course, the offline storage media itself must be migrated over time as storage media ages and becomes obsolete, with fixity checks

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Whit Jackson is VP of technology alliances for media and entertainment at Wasabi Technologies. He is driving the adoption of Wasabi hot cloud storage in media and entertainment creation and distribution, and throughout his career has worked at the forefront of innovation in TV and film production and distribution. wjackson@wasabi.com @wasabi_cloud.



Linda Tadic, CEO of Digital Bedrock, is a thought leader in media and digital preservation and metadata. She has more than 30 years' experience in leading preservation, metadata and digital production operations at studios, archives and cultural heritage organizations. ltadic@digitalbedrock.com @LindaTadic

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ABSTRACT: In the world of working remote and limited personal onset the entire production ecosystems has been forced to evolve. Capturing data from the camera, or DIT station and sending it to a globally accessible location has moved from an Idea to a reality. Unlocked an editor's ability to work from anywhere and still have a pleasant experience. This new age of cloud-based editorial is alive and already possible AWS.

By Matt Herson, Senior Content Production Specialist, and Brandon Lindauer, Solutions Architect, Amazon Web Services

Demand for remote production workflows has intensified to meet increased consumer demand for content over the past year. Content creation and post-production facilities around the world have begun to leverage virtual workflows to keep pace with production demands, and also ensure the safety of crew on- and off-set. Many content creators have turned to Amazon Web Services (AWS), one of the world's leading cloud providers, to power their remote production workflows.

The transition to remote working has challenged professionals to adapt to highly specialized, interconnected tools to enable remote configuration. For instance, to quickly process and play back high resolution and high-dynamic range (HDR) content, editors need access to high-end computer processing, memory and graphics processing units (GPU). Their work also demands fast and scalable network storage for media file access. Any constraints as a result of resource limitations could make or break a project and a facility's reputation.

Fortunately, AWS has created a set of focused blogs and solutions designed to help individuals and facilities take advantage of cloud-based technology to streamline remote workflows. Leveraging, AWS Management Console or automation systems like AWS CloudFormation, creative professionals can now easily provision multiple high-end workstations in the cloud that can run on an editor's preferred operating system and with all the specs expected of a physical workstation. The Amazon Elastic Compute Cloud (EC2) accelerated compute platform, for example, harnesses high performance GPU architectures

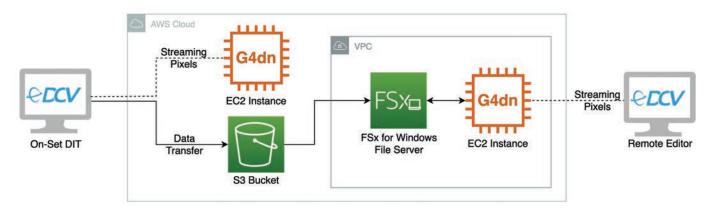
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AWS Cloud Editing



With AWS, cloud editing is managed securely and at scale in the cloud, allowing creative teams to focus on real-time content creation and collaboration.

that yield the G4dn and G4ad instance types, which use NVIDIA and AMD technology respectively. For editors and digital imaging technicians (DITs), this means they can replicate (or enhance) their on-site hardware in the cloud.

RECREATING THE ON-PREMISES EDITORIAL EXPERIENCE IN THE CLOUD

Immersive cloud-based editing requires a reliable, low-latency, high-speed streaming video connection. With AWS, all of the heavy processing is handled securely and at scale in the cloud, so that creative teams can focus on real-time content creation and collaboration. As security is always of paramount concern, securing the access path is the first step to a successful deployment. Limiting access to client IPs, VPNs and AWS Direct Connects establishes the first logical barrier to the wider internet. Adding in an authenticated source or a user with a secure password ensures the security of the new launch instance. Once a connec-

tion is forged, the host software can be installed on a cloud-based workstation and a lightweight client can be opened on a local computer to connect. The computer then becomes the gateway into the virtual edit suite. Most streaming protocol technology, like Teradici or Nice DCV, support multiple 4K displays, multichannel audio, and USB peripherals (for Wacom tablet or Jog shuttle).

ACCESSING MEDIA IN A VIRTUAL EDIT SUITE

Once a virtual workstation is established, accessing media across projects is simple. With the click of a button, you can add terabytes of storage and splice your way to delivery quickly, easily and at scale with FSx for Windows File Server. Storage is crucial, especially as performance demands run high with multiple users working on the same storage. Editors, assistant editors, data wranglers, delivery coordinators, encoders and other team members often cross-collaborate on projects

Continued on Page 162



Matt Herson is a senior content production specialist enabling global media customers to successfully run production workflows on AWS. With more than 10 years' of experience, he has a passion for innovation in the post-production space. mherson@amazon.com @awscloud



Brandon Lindauer is a solutions architect at AWS, focusing on helping customers succeed with production operations in the cloud. With more than a decade of experience in the media and entertainment space, he has a passion for sharing knowledge and providing solutions that drive innovation in the industry.

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CONTENT SECURITY FOR PREMIUM VIDEO CONTENT



By Brian Chavez, VP, Strategic Business Development, Signiant

ABSTRACT: The advent of cloud technology has greatly expanded the conversation around what media companies expect from their technology stack, and is changing the ways buyers and sellers interact. Specifically, with SaaS solutions, the relationship between the vendor and the customer is at the heart of the buying process, and continues throughout the entire customer lifecycle.

As the modern media technology stack shifts toward Softwareas-a-Service (SaaS) offerings, the technical and business model aspects of SaaS tend to come to the forefront. Those things are important, but arguably the most transformational aspect of SaaS is the impact it has on the relationship between software buyers and sellers.

In the SaaS world, software companies and their customers have continuous, ongoing interactions that involve a much higher level of mutual dependence than was the case with hardware or licensed software. This can create a very healthy dynamic between technology suppliers and media companies, but new ways of thinking are required.

ALIGNED INTERESTS AND SHARED OUTCOMES

When technology is acquired via an upfront capital purchase, the supplier doesn't really have a strong vested interest in whether or not a product is successfully deployed and adopted. There's generally a high-level desire to preserve the relationship in the interest of future sales, but it's somewhat decoupled from the specific product experience. To some extent, the vendor can throw things over the wall and make it the customer's problem to extract value from the purchase.

With SaaS, on the other hand, the software supplier cares deeply about deployment and adoption. Renewals and growth are the lifeblood of a SaaS business, and customers won't renew or grow unless the product is delivering real value. SaaS companies therefore invest heavily in building a shared understanding of their customer's desired outcome, and then proactively and continuously ensuring that the product is being used and delivering according to expectations. The customer success function typically assumes this responsibility within SaaS companies.

If value is being delivered, the annual renewal is a given and both parties benefit accordingly. The SaaS company books a renewal and the customer continues to benefit from a value-add service. But if the deployment isn't successful for any reason, the customer can always choose to not renew. This fact keeps the vendor on their toes and focused on successful outcomes.

SERVICE COMPONENTS

From an operational perspective, the mutual dependence between SaaS suppliers and their customers is very literal — the vendor deploys and manages software in the cloud on behalf of their customers. In the case of cloud-native, multi-tenant SaaS, a single deployment serves many customer entities and enables massive economies of scale. The SaaS supplier procures many of the necessary cloud services, operates the deployment on an ongoing basis, and continuously updates the software with new capabilities.

The focal point for these activities is the SaaS company's site reliability engineering (SRE) team, often referred to as DevOps in the early days of SaaS. The SRE group monitors the software on a 24-7-365 basis to ensure availability and security. If there's any disruption of service, they notify customers and take immediate action to remediate. In the event of an outage at a cloud data center, for example, they might switch a certain service (or the entire deployment) to a different cloud region. Service status notifications keep customers posted when there's an interruption or degradation of any kind.

WITH SAAS, the customer-vendor relationship is changing in ways that benefit media companies, the software suppliers that serve them, and the industry as a whole. Not all of the changes buffeting the industry in 2021 are positive, but this one definitely is.

Separately, the SaaS vendor's customer support team is available to respond directly to technical questions from customers. This critical function has carried over relatively unchanged from earlier hardware and licensed software business models. In media use cases, there are always integrations, technical deployment nuances, and user-related issues to be addressed on a case-by-case basis. The presence of a knowledgeable customer support team is a key difference between consumer-oriented SaaS offerings and the mission-critical enterprise offerings typically deployed within the media supply chain.

INFORMATION FLOW

Greatly increased information flow is another element of the evolving customer-vendor relationship in the SaaS world. Multi-tenant SaaS enables the SaaS provider to automatically collect, aggregate, and analyze a wide range of data, ranging from utilization of the software itself to various aspects of the environment it's operating in. Privacy considerations are obviously important here, and modern SaaS architectures are carefully designed to ensure that all of the data used for aggregate analysis is fully anonymized. Customer-specific insights are only ever shared with that customer.

The benefits of a continuous flow of customer-specific information are fairly obvious. That's how utilization is metered for consumption-based pricing models, and the vendor's customer success team can proactively reach out if discontinuities are observed. Customers can benefit from easy access to both historical and real-time data for operational insights and internal cost allocation.

Information exchange with the entire customer base Continued on Page 162



Brian Chavez is Signiant's VP of strategic business development and in charge of driving the company's growth in the large multinational media companies. He's a veteran in the media and entertainment technology field and has been involved in many supply chain, workflow and OTT projects globally. bchavez@signiant.com @Signiant



By Eric Rosset, VP, Business Development, CineSend

ABSTRACT: With the cancellation of in-person conferences, festivals and other media professional gatherings, 2020 saw the emergence of virtual events in the film and TV industry. NAB offered its first all-digital conference, Sundance pivoted to host an online streaming film festival edition. HBO launched a series on Zoom and CineSend, and in March the London Screenings largely took place online. In the future, we're predicting hybrid events — a combination of inperson and online — to emerge. R&D will be invested to make virtual events more suitable to drive business and sales outcomes, with enhanced interactivity and relationship-building opportunities.

It's March 15, 2020 and the Cleveland International Film Festival (CIFF) starts in a week. The festival has thousands of tickets and passes sold, an 8-plex cinema fully booked and 480 digital cinema packages carefully quality-controlled and ready to ingest, representing one of the largest annual presentations of film on screen. The only problem? Ohio's governor announced a lockdown amid the beginning of a global pandemic that would soon consume 2020.

CIFF could have followed Austin's South by Southwest (SXSW) example and canceled entirely. But they say in Cleveland as they do in Hollywood: the show must go on.

Within two weeks, CIFF completely pivoted to an online event. They swapped patrons' printed tickets for digital vouchers, and engaged with CineSend to launch OTT apps across Roku and AppleTV for redemption. CIFF called and emailed their 480 content providers and received the green light from 80 percent of them to convert their DCPs to MOVs and transcode them in the cloud to stream to patrons at home.

The high uptake of these solutions on the part of studios, distributors and filmmakers might come as a surprise, given the astronomical value of movies at





it's a love affair

film festivals. The festival window is pre-theatrical and any piracy or leak at this stage could be devastating to downstream sales opportunities. CIFF successfully negotiated with studios in part because the platform they chose supports all the bells and whistles: multi-DRM, visible watermarking, forensic watermarking, device restrictions and single-IP restrictions.

What's more, an entirely new security feature was engineered and launched within a matter of days to support the unique role played by regional events like Cleveland's: granular geo-blocking. Studios offer regional premiere status to partner events (think: "East Coast premiere" vs. "West Coast premiere") — easy to achieve when events involve people in seats. But how would the festival circuit accomplish this in the digital world? The answer: to build geo-blocking accurate to the ZIP code or state-level, using data gathered either at the point-of-sale, based on credit card address information, or at the point-of-connection, based on registered IP-address. Pulling this off in 2020 was a challenge, to say the lease.

With 400-plus films ready to stream and audiences trapped at home, this landmark online-only film festival was a major success. "We were thrilled by how well it went," said Mallory Martin, CIFF's director of operations. In the ensuing weeks and months, every major festival eventually announced that it would pivot online (including those who originally pledged it would always be cinema screen or nothing).

It wasn't long before other screening events followed suit. Arthouses dabbled in what is now called "virtual cinema," teaming up with mini-major distributors who license top content but who don't have the distribution budgets to compete in the direct-to-consumer streaming space with Netflix, Disney+ and the like. Arthouse cinemas and mini-major studios shared in the marketing expense and split the box office revenues 50-50, with audiences streaming from a plethora of newly launched localized "arthouse at home" mini-platforms.

As for the Motion Picture Association (MPA) members? The concept of premium VOD (PVOD) looked a bit differently. Universal's Trolls was first to skip theaters and went directly to home entertainment platforms, including iTunes, where Apple gave the film

STREAM-ALONE-AT-HOME

fatigue is real. The affliction calls for innovative approaches to keep audiences engaged.

major spotlight status to welcome the move.

Over a year into the pandemic, studios and mini-majors are still exploring and tinkering. In February 2021, A24 built an online PVOD screening room to premiere the film Minari. Sold-out shows streamed live at 7 p.m. ET daily to \$20 ticket holders. Minari's online success proved that audiences expect more than just the film: they expect an experience. A24 successfully generated social media buzz in the leadup to the event and scheduled showtimes with pre-roll before the film and exclusive bonus content following the movie.

STREAM-ALONE-AT-HOME FATIGUE IS REAL.

The affliction calls for innovative approaches to keep audiences engaged. HBO pushed the envelope with its "The Flight Attendant" invite-only experience targeted predominantly at press, influencers and superfans, to drum up buzz around the new show. Guests of the event were delivered fancy coffee ingredients and participated in a Zoom-like brewing course. But there was a twist: the host was kidnapped and not moments later guests received a bang at their door. Scary stuff! Naturally those invited — press, influencers and superfans — hurried off to post, Tweet and YouTube about their experience.

In the future, we're predicting hybrid events in-person and online — to emerge. Innovators will invest in R&D to make virtual events more suitable to drive business and sales outcomes, with enhanced interactivity and relationship-building opportunities. CineSend and other innovative streaming companies have already launched "watch party" add-ons, "timed event" setups, and offer food delivery to pair with a dinner-and-a-movie-at-home experience. What next does the future bring?

One thing we know for sure: the show must, and will, go on. ⊞



Eric Rosset is VP of business development at CineSend, a leading professional video platform, which powers digital cinema distribution, secure online screeners and virtual event solutions for Hollywood's top content creators and distribution companies. eric@cinesend.com @cinesend

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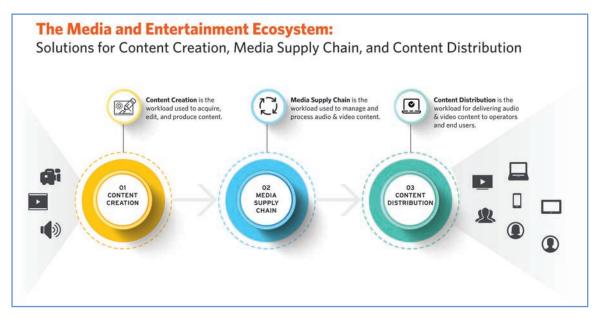


ABSTRACT: The rapid evolution of media and entertainment technologies and the explosion of the public cloud have created both opportunities and a confusing landscape of legacy and new tech. On top of that, the coronavirus pandemic has increased the pressure to build bestin-class, simplified media workloads. Below is an overview of the three media workloads you need to optimize now: content creation, media supply chain, and content distribution.

By Joaquin Lippincott, CEO, Founder, Tony Rost, CTO, Metal Toad

Over the last few years, technological innovation has sparked a massive and unprecedented renaissance in the M&E industry, transforming everything from content creation and distribution to the media supply chain and processes for every workload. Remote production, artificial intelligence and machine learning are creating exciting new opportunities for creating content, driving user engagement, and mining data for business intelligence. And as media consumption continues to break records, cloud technologies are making fixed storage and distribution costs — and the risks they create for businesses — a thing of the past. Evolving cloud technologies have accelerated not only the speed of change, but also opportunities for unprecedented optimization in media workloads for organizations that have the foresight and insight necessary to seize on them.

The downside of this rapid evolution is that many enterprises are tangled in confusion: one foot in the past with their legacy systems, the other foot in the present working to determine which new piece of technology will actually work. The "spaghetti ball" of entangled systems slows down innovation and misses opportunities the organization and its customers would benefit from by moving to the cloud. Only by understanding the



There are three primary media workloads: content creation, media supply chain, and content distribution.

end-to-end map of the cloud can organizations create a cohesive, organization-wide ecosystem optimized for their cross-functional needs and thereby leverage the full power of the cloud.

THE IMPACT OF COVID-19

As lockdowns spread across the globe, basic assumptions about how to create, manage, and distribute media changed almost overnight. The industry rushed to pivot to remote work while adapting to shifting consumer habits. The tools were all there for companies to rapidly capitalize on emerging opportunities.

At the same time, profits and stock prices for many major industry players plunged in 2020; Disney's profits fell 91 percent in Q1 of 2020, and WarnerMedia/AT&T's stock price dropped 30 percent at the end of the same quarter and has remained mostly flat. Streaming service use ballooned, but converting trial mem-

berships to paying subscriptions proved challenging. Overall, early 2020 projections estimated a \$160 billion loss in the M&E sector over the next five years.

As the industry wrestled with those challenges, the cloud sector boomed. M&E companies, along with other sectors, jumped at the opportunity to access scalable, cost-conscious solutions to transform their operations in the new environment. It's been a scramble fraught with obstacles, especially for media titans whose mass of tech stacks and siloed divisions stand in the way of rapid and efficient changes. Yet within that flurry of activity, impressive achievements have emerged — 33 million Peacock users in Q4 of 2020, successful streaming launches of several major films — and more organizations are waking up to the need for a cloud-based reimagining of their media workloads.



Joaquin Lippincott is the CEO and founder of Metal Toad, an AWS Advanced Consulting Partner that makes the cloud simple for media and entertainment customers. He is a 20-plus year technology veteran who has helped to modernize software for industry leaders including Sony, Daimler, Intel, the Golden Globes, Siemens Wind Power, ABC, NBC, DC Comics, Warner Brothers and the Linux Foundation. joaquin@metaltoad.com @joaquinlippinco



Tony Rost is the CTO of Metal Toad. He believes that customers' technology problems can be solved with deep respect, sound data, strong process, and adventurous teams. He uses data-driven methods to improve all stages of the development lifecycle. With numerous ties to the open-source community, Tony also works to solve client problems faster and more effectively with well-tested open-source solutions. tony@metaltoad.com
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A TECHNOLOGICAL TANGLE

The evolution of M&E technology has created a combination of opportunities and challenges. As new technologies emerge, the industry has remained reliant, in part, on older technology. Legacy technology built well over two decades ago is commingled with much newer technology — hence the spaghetti ball of systems many enterprises are grappling with.

The complexity of these commingled systems — which are common throughout the industry — fosters an environment in which many players don't even understand the tech options available or how to leverage them.

Few have a clear sense of systems outside of what they're currently using, making it difficult for decision-makers to be aware of and achieve the state of the art. And in some cases, even an organization's own systems — built by accretion for decades — are mysterious to those working within them.

Thus far, no holistic guide to the cloud universe for M&E has been available to help companies streamline their media workflows. Without that roadmap, money is wasted — to the tune of hundreds of millions across the industry — and untapped opportunities leave billions of dollars on the cutting room floor. Peacock's aforementioned success in signing up new users has come with an impressive price tag: an estimated \$2 billion dollars in losses in 2020 and 2021. Not to be outdone, AT&T has committed \$4 billion to HBO Max over the next three years.

THREE MEDIA WORKLOADS YOU NEED TO KNOW

Amazon Web Services (AWS) is an industry leader in cloud and media workload optimization, and AWS partners like Metal Toad serve to bring the power of cloud to M&E enterprises — creating the custom roadmap each company needs to create an optimized, scalable cloud ecosystem. The first step for M&E leaders is getting a clear picture of the landscape, the current tools, and what constitutes a best-in-class and most cost-effective media workflow.

These workloads consist of over two dozen technology functions; understanding what these are and how they work together reveals the universe of cloud services and products that M&E organizations can combine to revolutionize their capabilities and costs.

Together, these three workloads form a chain that allows media content to be produced and broadcast smoothly to millions of people all over the world with high quality. Optimizing this tech stack — and bringing them together seamlessly — will be a primary driver of success in the industry.

- 1. The content creation workload is the acquisition, editing, and production of audio and/or visual content. All content flows through this workload. This includes encoding, transport and ingest, remote editing, production storage, and much more.
- 2. The media supply chain workload is used to manage and process audio and visual content. Arguably, the internal supply chain is the most complex element of the M&E ecosystem. Legacy technology in particular can create bottlenecks that severely hamper flexibility.
- 3. The content distribution workload describes how audio and video content is delivered to operators and end-users. This includes rights and entitlements, subscriber management, analytics, video and audio playback, and more.

Here's a real-world example of the three media workloads in action: during the live broadcast of a sporting event, videos captured by on-site cameras are transmitted through the network, stored and transcoded in the cloud, transferred to the platform layer for content delivery and media resource management, and finally played to the end-user. At a technical level, this work involves network resource scheduling, node management, route planning, route node tuning, and even million-level concurrent balancing and P2P content distribution and transmission.

As you can see, a cohesive approach to building media workloads is crucial: each workload must flow seamlessly into the next to maximize quality while minimizing costs.

SEIZE THE POWER OF CLOUD WORKFLOWS

As you navigate the ever-shifting technological landscape — and the ongoing effects of a global pandemic cluing in to the cloud is key to not just keeping up, but leading the pack.

Metal Toad, an AWS Advanced Consulting Partner, is dedicated to demystifying the cloud and implementing its benefits for the industry. That's why we created a comprehensive guide to the M&E cloud ecosystem: a deep dive into the workloads and their functions to help you identify what a best-in-class media workflow can look like for your enterprise. In the white paper (bit.ly/me-ecosystem), you'll also find AWS Partners who can implement solutions for you, plus find out how Metal Toad can help bring it all together and transform your tangled tech into a well-oiled machine.



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By Lisa Gerber, Director, Business Development, Media, Entertainment, PacketFabric

ABSTRACT: It's well established that content production is moving to the cloud and content distribution is already fully there. Here we discuss how to approach the specific networking needs of virtual production, studio IP, and challenges and opportunities of using multiple cloud networking architectures. Further, we'll explore best practices for employee empowerment, education, equal pay and honoring our own origin as a female-founded company.

In the wake of unique challenges posed by the pandemic, virtual production is meeting demands of original content production. Exciting and aptly timed capabilities like virtual reality scouting and new camera-to-cloud technologies offer a solution to companies and artists working remotely and in disparate locations, often without the benefit of live interaction or traditional sets.

In spite of its clear advantages, virtual production also creates a need to manage more data, move larger files, and stay aligned through more complex workflows.

Whether for episodic or feature film content, streaming or live events, the boom in cloud services is well equipped to customize and adapt as production requirements evolve for everything from story development to distribution. It's been expressed that often the public internet itself — the way to actually reach the cloud — falls short.

In our white paper "Connectivity, the Cloud and the Creative Process," creative freelancers and other media and entertainment professionals identify their needs for connectivity. The research found that to ease adoption of any new technology, and specifically new modes of cloud connectivity, tools and services must be:

- Easy to use, quick to provision
- Secure
- Fast and jitter free
- Scalable, with the ability to transfer large files
- Able to mitigate egress fees

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www.stega.com +44 (0)203 880 0801 Phil Ashley | pa@stega.com Since publishing the paper in December, Packet-Fabric has added an additional service to its API-driven portal, one which not only meets the above needs, but also adds to one which is somewhat newly realized: the need to work seamlessly between cloud providers for a full multi-cloud based production pipeline, from idea to distribution.

The PacketFabric Cloud Router is the company's first foray into layer three as the Network-as-a-Service (NaaS) climbs up the chain in the open systems interconnection (OSI) model. The Cloud Router can provide seamless connectivity between different phases of production which are currently siloed from one another in terms of personnel, workflows and infrastructure.

Simply put, it allows routing between cloud service providers, dramatically reduces egress costs and the need for cumbersome VPNs, and revolutionizes a historically fragmented industry. It is accessible and easily provisioned through the company's self-service portal or standards-based API.

As the industry insider organization, MovieLabs' shared in its follow up to the 2030 vision paper, "Software Defined Workflows," the future of cloud production will require more automation and interoperability between historically siloed phases and workflows. A disruptive form of connectivity is therefore required to be nimble and cloud agnostic to route between previously fragmented steps and processes.

As with any connector, partnerships and interoperability will be vital to this evolving virtual production and multi cloud ecosystem. PacketFabric positions itself in the industry accordingly.

The very nature of a middle-mile service like Packet-Fabric is integration. Private backbone, cloud connectivity, or point to point connections are a means to an end. They're a vital piece of a larger solution, especially when the use case and end result require secure, easy transfer or access.

These larger solutions often take the form of strategic partnerships. PacketFabric is connecting continents with its partner Colt, to expand its services into Europe. It also partners with system integrators across verticals to furnish solutions for users for whom security, project timelines and ease of use are non-negotiable. Cloud

AS NETWORK-AS-A-SERVICE

(NaaS) continues on its path towards automation, robust partnerships and interoperability, one can expect it to be connecting media and entertainment, uniting companies and people, well into the future.

storage and CDNs can join forces with PacketFabric to ensure safe and fast access to their respective services, and the NaaS also works directly with customers, giving companies who previously struggled with the public internet, an on-demand portal with their own secure and scalable connectivity. A visual effects rendering use case, wherein a company is connected to their chosen cloud provider for a period of a few weeks, can be spun down and re-provisioned instantly.

A company revolutionizing the way network connectivity is consumed, PacketFabric also has its eye on the future of diversity and an inclusive company culture.

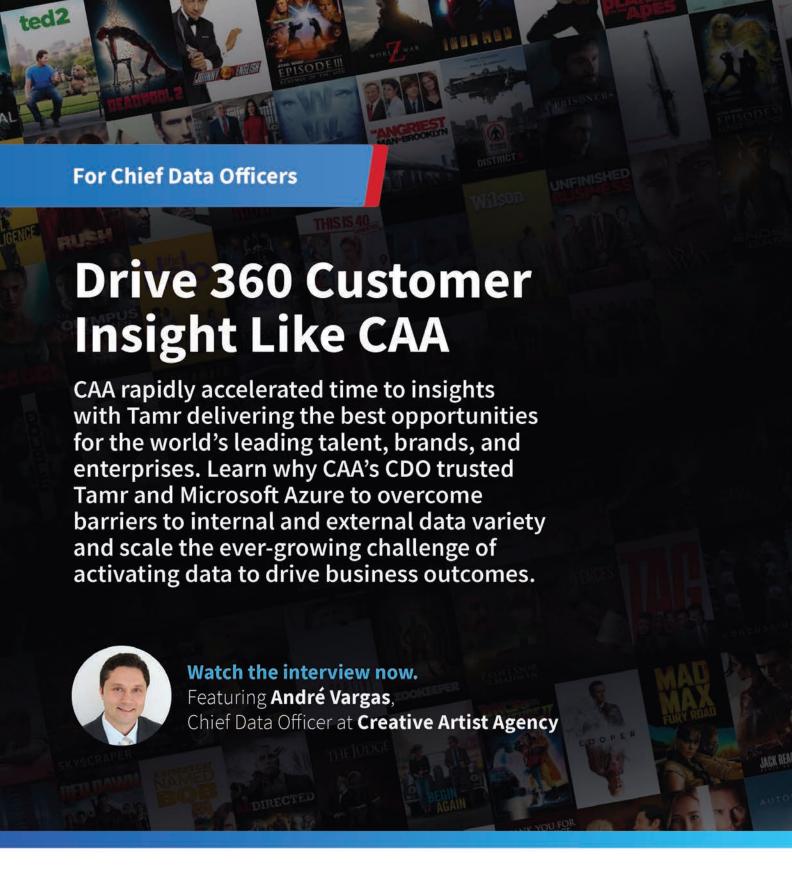
The company's employees have worked remotely since its founding in 2015. Its diverse workforce collaborates virtually from all over the world, ensuring that it is never without someone available for customer or partner support. This global mindset has bolstered the company from the beginning.

To quote PacketFabric CEO Dave Ward: "One of our chief focuses is shaping and implementing breakthrough best practices for employee empowerment, education, and equal pay. In so doing, PacketFabric honors its spirit both as a technology disruptor and its origin as a female-founded company."

As the NaaS continues on its path towards automation, robust partnerships and interoperability, one can expect it to be connecting media and entertainment, uniting companies and people, well into the future.



Lisa Gerber is the director of business development for media and entertainment at PacketFabric. In her role at PacketFabric, she identifies private connectivity use cases for M&E as the industry evolves to embrace new tools and processes for an increasingly decentralized workforce. Her specialty lies in bringing together different types of creative innovators, from visual effects artists to network engineers, and in strategizing groundbreaking and substantive models for success. lisa.gerber@packetfabric.com @packetfabric









By Kevin Ottomeyer, Director, Solutions Architects, Teradici

ABSTRACT: Understanding M&E organizations and their requirements has been key to creating that ecosystem of solutions that enabled each unique studio to be successful on their journey to virtualization, either from an on-premises private cloud, a hybrid environment, or public cloud.

Virtualization has been around for quite some time but until the COVID-19 pandemic, the methodology hadn't been widely adopted by media and entertainment companies, mostly due to the workflows that are so unique to the industry.

For one thing, M&E workflows have consisted of high-powered workstations sitting underneath artists' desks that would be used for their heavy graphics workloads. It's tough to tell an artist that you are taking away that machine and replacing it with a device one-tenth the size and convincing them it's going to be an as good or even better experience.

Of course, that challenge was met with other external factors, including requirements for artist pen displays and tablets, color-corrected monitors and multifactor-authentication, among others.

So, from the outside looking in, it seemed like a daunting task to virtualize these workloads and make sure the experience was just like an under-the-desk workstation including all the unique devices artists used for their workflows. To that end, Teradici's ecosystem allows visual effects, animation, broadcast and game development studios to have an amazing remote desktop experience, whether they are in the studio or geographically distributed.

A key part of that experience is making sure there are no negative impacts as artists and content creators are increasingly separating themselves either because of new protocols with COVID-19 or new work from home policies.

Teradici Cloud Access Software (CAS) offers features like Teradici AutoOffload that enables artists to either manually or automatically switch between the image and video fidelity based on their workflows needs. This is key to maintaining the experience between preand post-production workflows.

HOW CLOUD TECHNOLOGIES FIT INTO THE **EQUATION**

Scalability and agility are front and center when we talk about the advantages of using cloud-based architecture. When we talk about the cloud, it can be categorized in three overarching methodologies: private, public and hybrid.

Private cloud is the traditional data center model, with resources, CPU, memory, storage, networking all purchased, managed and maintained by the studio, traditionally a capital expenditure.

In a public cloud, on the other hand, those resources are managed and maintained at the hardware level by the cloud provider and the customer is responsible for everything above that layer.

Teradici plays very well into all these scenarios, including the third, which is the hybrid model.

The hybrid is by far the most popular environment we are seeing in the industry today. We see customers leveraging existing equipment in the data center that still has a lot of life left in it with a combination of some burst resources in the cloud for expansion or short-term projects.

The hybrid model gives the added benefit of flexibility to move existing, and burst new, workloads very easily without the hassle of staging and purchasing new equipment. With CAS, we help link these two data centers by allowing the customer to tap into their on-prem resources and at the same time leverage their cloud resources in one central control plane interface (CAS Manager).

DO YOU NEED THREE REMOTE WORKSTA-TIONS SPUN UP FOR A NEW PROJECT START-**ING TOMORROW?**

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THE HYBRID MODEL gives the added benefit of flexibility to move existing, and burst new, workloads very easily without the hassle of staging and purchasing new equipment.

cloud or on-premises instances from the console, assign them to the correct artists and you are ready to go in a matter of minutes. It's essentially a private Desktopas-a-Service (DaaS) platform for customers who want both the flexibility of their own applications and images with the ease of use of a managed desktop type of model.

WHAT THE DATA JOURNEY ALONG THE WAY **WILL LOOK LIKE**

Where to put the data, how to replicate it and whether it is secure in rest and transit are all key things to think about when architecting an organization's data model.

By utilizing Teradici solutions such as CAS, data is fully encrypted in transit, providing peace of mind so that organizations can focus more on securing that same data at rest. We also have a solution that enables our customers to skip the virtual private network (VPN) and use our built-in Security Gateway included in CAS Manager.

This component of CAS Manager offers a highly encrypted micro-VPN tunnel that allows CAS connections to flow freely between endpoint and remote workstation, essentially displacing the traditional VPN.

All transmissions are then done via pixel transformation and the need to copy files back and forth between a data center and workstations becomes a thing of the past.

This proprietary process allows all the data to stay where it can be secured, cared for and maintained per the organization's strict standards and practices. Allowing for the highest level of data integrity possible, while still maintaining a world-class artist experience.

SECURITY AND CONTENT PROTECTION ARE **GUARANTEED AT EVERY STEP OF THE PROCESS**

M&E companies can, meanwhile, be confident their content is safe throughout the process if a Zero Trust Architecture is being used, as is the case with Teradici's solutions.

While traditional security is easily exploited with ma-Continued on Page 158



Kevin Ottomeyer is the global director of solutions architecture at Teradici. An Emmy awardwinning principal solutions architect, he focuses on driving and influencing the roadmap for CAS and CAS Manager, two of Teradici's solutions that are widely adopted throughout the M&E industry. kottomeyer@teradici.com @OttoKnowsBest



ABSTRACT: OWNZONES worked with a high-profile U.S. studio to take its supply chain inhouse. Previous to this, the studio's supply chain was outsourced to two service providers, one managing content, the other distribution. The desire to move operations to the cloud under Amazon Web Services also allowed the studio to consolidate its supply chain, gain greater control and ownership while maintaining cost-effectiveness.

By Bill Admans, SVP, Operations, OWNZONES

While outsourcing still has a significant role in the media and entertainment industry, many broadcasters and studios are starting to look at less savings and are thinking about taking the outsourced elements of their workflows back in-house.

The general move towards cloud-based solutions is at the heart of this. Not only is the cloud realizing the savings that previously could be made from outsourcing, it offers workflows at lower costs. The cloud is enabling companies to scale with none of the weighty infrastructure costs that drove the decision to outsource in the first place.

Savings that often ran into the 20-30 percent territory two decades ago are now closer to 5 percent, and outsourcing deals usually come with potentially punitive lock-in periods that can further erode the economics that drove the decision in the first place.

The reduced economics of outsourcing leads many large media organizations to conclude they are better off managing their own workflow. As an illustration of this, OWNZONES recently worked with a high-profile U.S. studio on a project to take its supply chain in-house.

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OUR NEW RESPONSIVE FILE DELIVERY WEB-APPLICATION

Real-time enterprise content management and watermarked file delivery web-application

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INCREASINGLY, RATHER THAN OUTSOURCING as in previous decades, media companies find that automating the digital supply chain is one of the top places where they can make genuine savings.

Previous to this move, the studio's digital supply chain was outsourced to two major companies, one providing content, the other distribution. However, the desire to move operations to the cloud under Amazon Web Services (AWS) also allowed the studio to bring its supply chain under its own roof. This move would see the studio gain greater control, flexibility, and full ownership of the digital supply chain while achieving cost-effectiveness thanks to the solution being placed in the cloud.

The key to the process working was specifying OWNZONES Connect to fulfill the workflow's media asset management (MAM) functions from ingest through processing, packaging and delivery. As well as leveraging cloud processing which can, for example, transcode a 2.5-hour high-definition feature film in under a minute, OWNZONES Connect's use of the Interoperable Master Format (IMF) is a game-changer for cloud deployments.

IMF works by creating a single master version of a title, whether that be a movie, a TV episode, or a commercial. To make multiple deliverables from the title, all you need are the files representing the differences. The common elements and differences are virtually compiled as new masters using Composition Play Lists (CPLs) that reference the available essence components as required. This componentized approach means it is a quick and simple task to distribute differing copies of a title to an OTT service on the one hand and an airline on the other.

This ability to store multiple versions of titles as a master and accompanying CPL files, rather than separate full copies, can save more than 70 percent on storage space. In the case of the studio the savings represent several Petabytes per year, which translates to millions of dollars over the project lifecycle. This saving is an important consideration when moving from on-premises storage — outsourced or not — where storage costs are often overlooked, to the cloud, where they are a significant component of overall operating expenses.

It's worth pointing out that IMF has other advantages too. For one, it doesn't constrain a broadcaster or studio to specific tools or workflows in the digital

supply chain. Because IMF is widely supported by so many vendors, it means content suppliers can choose different tools for various aspects of a job depending on what best suits them at the time. Instead of, for example, working in a single NLE and having to return to the same timeline at all future points down the path, uploading the content into the cloud under the IMF specification means that a wide variety of different workflow tools and other post processes can access the content master as well.

Where this studio is concerned, more than five million assets have been mapped, cataloged, and ported over to their new supply chain, with the process currently ongoing. OWNZONES is used at ingest to alleviate many of the pain points surrounding metadata and for AI-powered content discovery, conformance and indexing. Elsewhere, the platform's extensibility allows for API integration to provide integration with other areas of the studio's overall workflow, providing a high degree of efficiency through automation for tasks such as scheduling operations, licensing content, managing billing, rights management, and more.

Increasingly, rather than outsourcing as in previous decades, media companies find that automating the digital supply chain is one of the top places where they can make genuine savings. And with artificial intelligence and machine learning assistance becoming steadily more powerful, the efficiencies that can be realized via the automation of the digital supply chain and business processes will only increase.

Given the project's sheer scope, several milestones are yet to be reached. However, significant savings are already being realized. Sign-off for the project is scheduled for September. ⊞



Bill Admans is SVP of operations for OWNZONES, leading the operations, product development and marketing teams. He develops and executes the growth and innovation strategy that is making OWNZONES the premier cloud platform for creative and supply chain workflows. bill.admans@ownzones.com @OWNZONES



NEW CONSUMER EXPECTATIONS CAN LEAD TO POST-PRODUCTION COMPLEXITIES



ABSTRACT: While OTT cost is still a factor with consumers, it's no longer the most significant reason they stick around. When asked what drives their loyalty, our research found almost half of consumers said the amount of content, followed by the quality of content (43 percent) and pricing (24 percent). When asked why consumers canceled a service, lack of exciting content was the main reason (38 percent). With roughly the top eight global content producers slated to spend more than \$100 billion on content creation, an accelerated production path to revenue conversion will remain in focus. Here's what content providers can do to keep up with demand.

By Darby Walker, VP, Media, Juice Worldwide, Division of Vubiquity The COVID-19 pandemic has impacted the media and entertainment industry in different ways. For one, our research found that more than a third (34 percent) of consumers added a new video streaming service to their viewing catalog. On the other hand, Los Angeles filming hit record lows, with fourth-quarter production down almost 25 percent.

Fortunately, with vaccines being administered and the markets indicating a more bullish 2021, the narrative will likely shift towards the positive. However, consumer expectations have changed during the pandemic, and that brings some new considerations to the table.



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THE REASSURING NEWS for these consumers is that the production pipeline looks healthy. Billions will continue to be spent on new content in 2021. Studios, streamers and production companies are expected to get back to a regular production cadence upon clearing COVID-19 concerns and fully regaining their capacity.

CONSUMERS WANT A STEADY STREAM OF CONTENT EVEN MORE THAN A LOW PRICE

While cost is still a factor with consumers, it's no longer the most significant reason they stay with their streaming providers. When asked what drives their loyalty, our research found that almost half of consumers said the amount of content (49 percent), followed by the quality of the content (45 percent) and pricing (38 percent).

The reassuring news for these consumers is that the production pipeline looks healthy. Billions will continue to be spent on new content in 2021. Studios, streamers and production companies are expected to get back to a regular production cadence upon clearing COVID-19 concerns and fully regaining their capacity.

CHANGES TO THE POST-PRODUCTION CYCLE

While post-production from major studios did slow over the past year, the pandemic brought increased output in other areas. Reality TV was a significant television driver in last year's Q4, with an estimated increase of 93 percent compared to the previous year. We also saw the rise of "pandemic-friendly" programming, with the likes of "Selena + Chef" on HBO Max making an impact, and the restoration of older films and TV shows as they find a second life on streaming.

As the traditional speed of content comes back, we don't expect these new areas to go away, putting more pressure on the post-production process to get everything out promptly. Remote work and increased collaboration across production studios, which were tested during the pandemic, will become necessary to ensure a timely turnaround.

Beyond this, expect artificial intelligence to be used in support, not as a replacement, to the human touch moving forward. For example, listening to a sentence and filling a gap without an actor coming to the studio to re-record, saving time and money. AI can also better capture metadata through an automated process, better noting when content was created or updated.

A REVISED LOOK AT GLOBAL DISTRIBUTION STRATEGIES

Due to the pandemic, licensing and availability rights have changed in such a way that consumers now expect content to be available immediately – regardless of location or language.

The challenge is getting a piece of content that is culturally acceptable, meeting standards and censorship practices of specific markets, and is localized in a robust and high-quality manner. Equally important is ensuring that the content is relevant to the individual, meaning that providers balance several sets of expectations.

Just as AI recommendations are being used to get the right content in front of the right people on streaming services, it can also determine what unique stories, release schedules, and advertising connect most with consumers. Expect this to become an increasingly important part of the post-production process.

Taking these considerations into account, coupled with new consumer expectations, could demonstrate what these critical final steps look like in the future.



Darby Walker is VP of media for Juice Worldwide, a division of Vubiquity. Recently, Walker was executive producer at Incendio, a Venice, Calif.-based post-production house specializing in color for commercials and music videos. dwalker@juiceworldwide.com@Vubiquity

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ABSTRACT: Main aspects of any cloud project need to include a highly scalable, secure infrastructure, being sure it can handle wide fluctuations in customer traffic, and that it can establish a fully automated release cycle.

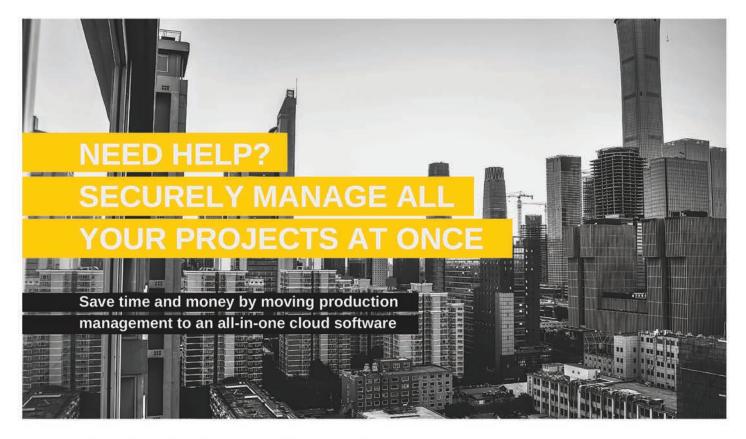
By David Kirk, OOONA, Stylus Media Communications

Many manual processes have simply become impractical in today's internet-connected world. OOONA Integrated — our API for enterprise integration — automates most manual activity, making operations streamlined and cost-efficient. Users can work from any internet-connected location and have instant access to up-to-theminute data, including full visibility of the status progress and all associated costs for each task.

A pay-as-you-go pricing model allows users to select the tools they need for any given project. Each tool is accessible online from any computer, Windows or Mac, using a simple and intuitive web interface. These functionalities are protected by OOONA Cloud, which is quality-checked round the clock. OOONA Cloud is also supported by a network operations center

Our main requirement was a system which would allow uploads and downloads on a large scale in a world-wide deployment. Security and availability are the key issues. The system must be as secure and stable as possible and support online time nearly 100 percent of the time. After evaluating several solutions, we decided on Amazon Web Services (AWS) as the platform to go with, working in co-operation with DevOps specialist Automat-IT. Files uploaded to OOONA Manager are linked and made available for streaming. The entire process is seamless from a user perspective.





CLOUD SOLUTIONS FOR CREATIVE PEOPLE

Production workflow automation to keep your whole creative team on schedule. Collaborate. Communicate. Create.



SCRIPT STORAGE

Secure online archive for sharing and storing scripts



SCHEDULING

Create digital stripboards and shooting schedules



CALLSHEETS

Generate callsheets quickly with automatic data fills

FULL AUTOMATION provides a strong safeguard against human error.

HIGH SCALABILITY AND SECURITY

There were two main aspects to the OOONA Cloud project. First was the creation of a highly scalable infrastructure which is secure and can handle wide fluctuations in customer traffic, from regular, right through to peak. The infrastructure is built around AWS, fully automated and secure. We are using a machine-learning algorithm to alert us to any anomaly in the cloud infrastructure and user actions. The second was to establish a fully automated release cycle, ensuring all the facilities offered within OOONA Cloud are tested in a uniform environment before they reach the customers. Full automation provides a strong safeguard against human error. The system is monitored and supported by a network operations center, with a 24-7 fast-response team to address any issues.

COMPLETE HOSTING SOLUTION

The resultant service, OOONA Cloud, is a complete hosting solution to support the scalability, security and performance for all of OOONA's applications. It operates

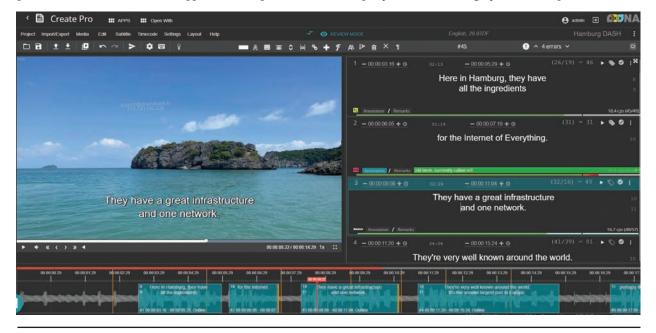
on multiple cloud services, such as EC2, Route53 and CloudFront. With the help of Automat-IT, OOONA is now able to expand its services globally and deploy new software versions in minutes.

OOONA Cloud uses high-efficiency serverless technology combined with a video transcoding system designed and implemented to handle any number of video transcoding jobs. The system uses Lambda, SNS, SQS, S3 and Fargate for EKS (Kubernetes), alongside an advanced deployment pipeline. The result enabled OOONA to minimize operating costs and offer its customers competitive pricing.

ONE-STOP SHOP FOR LOCALIZATION SECTOR

Our goal right from the company's inception has been to become a one-stop shop for the entire localization business sector. Most gratifying of all is the response from our user base, which has proven extremely positive over the years, encouraging us to stay ahead of the development curve.

An example of the OOONA range of localization production tools.





David Kirk is a broadcast industry analyst and author with mote than 40 years of experience, including 13 years as editor of the International Broadcast Engineer journal. Based in the UK, he established Stylus Media Communications in 2000 and is currently its CEO. stylusmedia@gmail.com @Ooona13



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Take back control with OWNZONES Connect, the cloud-native platform for servicing your content that automatically scales based on demand to transcode video up to 35 times faster. Reduce costs when using IMF and our Al solutions to shrink your storage footprint. Monetize your media using data driven business intelligence. Integrate with business process systems to fully automate your workflow. Deliver to all popular global OTT platforms, media aggregators, and broadcasters.



EVOLVE Continued from 33

manages the life cycle of a project from pre- to post-production, including the assets as they move through a digital production cycle." In the future, productions can utilize a single platform from pre-production to manage scripts, to shooting schedules, to managing assets, as they are created, and then shared (via cloud storage) to specific post-production resources.

From a security standpoint, the flexibility of working from home may be the first line of what stays or goes, Gaietto added, with some companies already planning on bringing everyone back, and others are evaluating based on the employment role.

Mathew Gilliat-Smith, EVP for M&E security, risk and compliance services firm Convergent Risks, said no matter what path productions take going forward, content companies better have the right guidelines in place.

"When rapidly deploying new SaaS applications, regardless of whether remote productions are here to stay or not, if specific hardening guidelines could be made readily available, it would go a long way in helping to prevent configuration errors, and ensuring production environments are set up more securely," he said. "Until production footage is safely uploaded to the cloud environment or dailies vendor, assets still need supervision — especially if there are less people around on remote productions. Even a low-resolution copy accidentally finding its way to social media can be very damaging."

Changes in consumer behavior may have had the biggest impact on how the industry approached protecting content during the pandemic, and should continue to be a factor moving forward, according to Alan Ogilvie, lead product manager for Friend MTS, which provides platform, channel and content protection services. To keep up with consumer demand and expectations, many content owners, broadcasters and operators are realizing the need to incorporate an end-to-end approach to piracy, one that includes monitoring and takedowns, as well as insights to identify tendencies and trends of bad-actors within subscriber bases.

"Producers and distributors will continue to experiment with new acquisition and release workflows, potentially changing the outlook of how content protection technologies are implemented," he said. "Early release windows, or tightened release windows, will likely continue in some form for premium VOD services such as Disney+, Prime Video and HBO Max, among others.

Efficiencies have been gained within the media industry thanks to the work-from-home culture, which has affected best practices on ways to move video around in a more secure fashion. Now, media asset managers see the need to develop strategies on where and when protection measures are put into place to effectively manage, store and distribute their digital assets safely."

If the pandemic has proven anything, it's that remote working with media assets is a security challenge that will need to be navigated in new ways, according to Lee Griffiths, COO of digital content protection solutions firm Fortium Technologies.

"It's emphasized the need for businesses to adapt to new ways of working. Solutions that secure content outside of the usual protections of a tightly controlled working environment are an essential part of future, modern working."

MISHRA Continued from 12

shows. Outsourcing of production, automation of business processes, and application of AI and machine learning, all continue to reduce the professional workforce. In addition, the preference for internal promotions reduces new hires. The combined result of these phenomena reduces job openings to achieve desired levels of DEI

While the supply of talent from minority or inadequately represented sources continues to grow steadily, an unprecedented commitment must be made to the overall education and development of potential talent. And support for college courses in media and entertainment must be increased by Hollywood. A STEM program is a perfect example for fostering careers in science and engineering for business and technology. This is the long-term challenge to overcome, the fundamental problem in the primary areas of equality for race and gender. It's evident that while corporations assist colleges and high schools to seek business careers, unlimited opportunities exist for Hollywood professionals to volunteer in the career preparation phase of students for a job in our industry. Some examples of these pioneering organizations are Women in Technology Hollywood (WiTH), National Society of Black Engineers (NSBE), Society of Women Engineers (SWE), Society for Advancing Chicanos/Hispanics and Native Indians in Science (SACNAS), and the National Black MBA Association (NBMBAA).

COGNIZANT Continued from 17

- New market opportunities generated by multiethnic, multigenerational, multitalented teams that challenge convention.
- Higher performance and growth through diverse ideas and perspectives from unique and often underrepresented talent pools.
- Modern digital solutions that aim to avoid biases, such as AI and analytics, machine learning, data science, and digital transformation strategies.

THERE'S MORE TO BE DONE

We know we have more work to do, particularly when it comes to women in leadership, ethnic diversity and inclusion in India, and globally. However, I will say that after being at Cognizant for nearly a decade, and now having the privilege to speak with even more colleagues around the world about D&I, I've never been so convinced that we will achieve our goals.

All of these efforts go beyond the borders of our organization. Because at the end of the day, we're not just improving diversity at Cognizant and creating more inclusive teams.

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PADEM Media Group - Globally driving Streaming Media, OTT Entertainment and Interactive Education advancement and growth by partnering with extraordinary global leaders, inventors, scientists and exceptional companies through intelligent technical implementations and market motivation since 2007.



GEOGUARD Continued from 64

- Downloading fake location apps or HTML5 browser add-ons to falsify coordinates
- Streaming from a smartphone, where the IP shows up as the location where the phone was registered not where the device actually is

Faced with these ever-evolving techniques to spoof location, moving beyond IP for viewer location verification is becoming increasingly important for protecting geographically restricted content — especially when it comes to higher-value content such as pay-per-view live sports or online movie premiers.

In order to outsmart these new spoofing techniques, OTTs will need to utilize advanced geolocation solutions that can verify the true location of a viewer via multiple data sources including Wi-Fi, GPS, GSM and HTML5, along with real-time and historic risk analysis.

Granted, this approach may seem a little heavy-handed for low-value content. But, as the SVA points out, when it comes to big-ticket sporting events and highly anticipated movie releases, not adopting stronger geolocation verification methods could cost studios, sports leagues, rightsholders and premium OTTs billions in lost revenue.

GeoGuard's core geolocation and fraud detection technology was originally developed for the highly regulated and exacting U.S. online gaming market, where ensuring the true location of a player is critical to complying with state and federal laws. However, this technology is highly adaptable and configurable in order to meet the specific needs of the streaming video industry to combat the ongoing and evolving geo-piracy threat.

Long story short, if we want the entire streaming ecosystem to live long and prosper, we need to consider geo-blocking an essential part of our security and anti-piracy strategies. \blacksquare

ATMECS Continued from 36

like? Maybe we need an Interactive Media Creation Platform, IMCP (we have to have a three- or four-letter acronym ... it's part of the technology business).

Here is how it would work. First a basic story is conceived. Take for instance a western story set in a galaxy far, far away. The storyline is established, production and talent teams are assembled and production begins. Consumers can subscribe to the "dailies" via the IMCP, feedback can be discussed in Facebook- or Zoom-type chat rooms around the world, characters and scenes could be created or changed in minutes based upon CGI technology, alternative storylines could be conceived, new live-action scenes could be shot the next day, the direction and production staff could take this input into consideration and proceed with the original storyline or move the direction of the content to new horizons based upon the interaction. New content could also be localized based upon global input.

Another way the IMCP could be used is at the end of the creation process. All of the artifacts and simits of the production that end up on the virtual cutting room floor could be placed within the editing section of the IMCP thereby allowing the consumer to make their own movies, or content. The user and fan community could create a new partial movie, short Quibi type content, or full-length movie based upon the original extras, CGI created video, and then publish it within part of the IMCP for friends and the public at large. Fees could be charged for this engagement process, and also to view the new content. Revenue could go back to the original content rights owners.

All of this interaction would be based upon technology and tools we have at our fingertips such as: social media interactive sites, group collaboration room technology, cloud-based content editing and publishing tools, and common device, mouse, swiping, and typing skills.

So, the challenge has been thrown down for innovation over improvement. Who will join this quest? IMCP... coming soon to a desktop, tablet, or phone near you. \blacksquare

RED BEE Continued from 96

Our approach to ASR technology at Red Bee is to combine the best engines with our in-house captioning expertise. We don't develop our own ASR technology (we leave that to the R&D teams at companies like Speechmatics, Amazon and Google) but we do keep track of all the major ASR technologies, and how they perform for captioning use cases, on a regular basis.

When delivering our service, we use the best ASR engine currently available as a foundation, and then apply our own technology, expertise and experience to maximize the accuracy. First, we ask our speech-to-text experts in the captioning teams to train the engines regularly with new terms and vocabulary. There's an art to this; it's not as simple as uploading a list of words because text and audio often don't follow logical pronunciation rules. For example, my surname Gauthier is pronounced "go-tee-ay" but I would guess an English-language trained ASR engine would follow English pronunciation rules and expect it, wrongly, to be pronounced "gaw-theer." Our captioning teams know all of this and know how to get the best results by optimizing vocabulary training to ensure the best chance of an accurate transcription. Second, we apply tens of thou-

sands of bespoke house styles, built by our teams, to improve readability. ASR engines tend to format everything as text: "COVID nineteen," "ten thousand five hundred pounds," "twelve forty-five pm." Using house styles created by our teams, you get "VOID-19"; "£10,500" and "12:45 p.m." A much easier reading experience.

It's fair to say we've embraced automation at Red Bee. Using third-party ASR engines and our captioning experience, we've built a fully-automated live captioning service called ARC that reduces the price of a live captioning service by at least 50 percent, and it's proving increasingly popular for broadcasters on certain types of content in English and Spanish.

Automatic captioning is on the rise, and our priority is to handle that transition responsibly. When I was watching "Humans," it struck me that almost all of the characters are just trying to work out how to combine their human experience with what seems like the inevitability of automation. It's not too far removed from our approach to automatic captioning: you're never going to get the best out of it unless you combine the latest technology advances with every bit of your human expertise. \blacksquare

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OTOY Continued from 108

transaction confirmation times, and high transaction fees. Finally, although NFTs are currently exciting, the novelty of owning a GIF, JPG, or MOV file might wear off unless more complex 3D files and digital assets are available that create a more immersive, interactive, and engaging experience.

At OTOY and RNDR, we are working on solutions to all of these challenges. On top of RNDR, our blockchain GPU rendering network and 3D marketplace, we are building rich metadata tools that can authenticate 3D files or objects uploaded to the network, attaching uniqueness and verifiability to the file itself, not just the blockchain smart contract. As images are uploaded and processed on RNDR they are hashed in a smart contract at the point of creation, providing a more robust toolset to validate NFTs as authentic across all digital asset marketplaces.

Additionally, due to its use of GPU power to render images
— a major need for the M&E virtual workflows — the network
generates productivity rather than computational waste from the
operation of the blockchain network.

Finally, because the NFTs created on RNDR are built from OTOY's ORBX 3D file format, which is being standardized as part of the Immersive Technology Media Format (ITMF) for next-generation holographic media, works created on the network will be

compatible with both 2D screens and the emerging AR displays of the future. Attaching NFTs to underlying 3D files rather than simply outputted JPEG and MOV files, enables artists and brands to both create interactive NFTs that can live in gaming environments, as well as "future-proof" an NFT to be compatible for the emerging display technologies of the future, like glasses-free holographic screens and mobile AR. Deep verification tools, reduction of computational waste, and semantically rich 3D NFTs will become increasingly important as artists, brands and developers look to innovate the state of the art in digital assets.

Ultimately, NFTs are still in their "Napster days" and the winners will be those who get ahead of the curve now. Once more efficient tools for tracking and monetizing digital assets are widely available, the NFT revolution will undoubtedly benefit content creators, brands, and IP owners.

This should be music to the ears of M&E brands that have historically experienced corrosion of legacy business models in the first wave of digital transformation. By adapting NFTs to your product and revenue strategy, you can capitalize on the remarkable opportunities that digital interconnectivity is creating — to engage with fans globally, increase diversity, and experiment with new methods for producing and monetizing IP. \boxplus

DELUXE Continued from 112

out-of-synch audio dub on a premium content platform gives localization a bad name and viewers a reason to tune out and turn off.

With heightened consumer demand, localization providers are under increased pressure to deliver in more languages and formats in less time. It is not uncommon as new streaming services launch, for companies with robust pipelines to ingest dozens of titles for localization into sixty or more languages. To deliver top quality and that level of volume requires innovation and scale, along with a globally distributed talent pool who leverage advances in technology in combination with expertise in the nuances of human language.

At Deluxe we believe that providing support and resources that nurture our translator and voice actor community around the world is as important as our commitment to technology and innovation. Our worldwide footprint, global workforce, and the most sophisticated distribution pipeline in the market provides our customers with the kind of scale and bespoke attention to their content that streaming services need to compete.

As advances in machine translation and AI continue to present opportunities for speedier workflows and potential cost reductions, it will be important to resist choices that could lead to the commoditization of localization services and degradation of quality. To achieve scale and to honor the creative vision of a project when globalizing content, the use of new technologies must deftly balance budgetary and timeline needs with the audience's enjoyment and understanding of the intent, context, and connotation being presented by the storyteller, in any language.

TERADICI Continued from 141

licious intent, a zero trust strategy eliminates trust and continuously verifies all applications, devices and users.

Meanwhile, Teradici's PC-over-IP (PCoIP) technology provides an additional level of security. It uses advanced display compression to provide end users with on-premises or cloud-based virtual machines as an alternative to local computers. The virtual workspace architecture compresses, encrypts and transmits only pixels to a broad range of software clients, mobile clients, thin clients and stateless PCoIP Zero Clients, providing a highly secure enterprise environment.

From the user's perspective, there is no difference between working with a local computer filled with software and an endpoint that receives a streamed pixel representation from a centralized virtual computer.

The PCoIP protocol transfers only display information in the form of pixels. Therefore, no business information ever leaves the cloud or data center.

Also, because enterprise data and software are safely secured inside central systems, bad actors can't tamper with the user's data or infiltrate their applications by compromising their local devices.

PCoIP traffic is also secured using AES 256 encryption that meets the highest level of security required by governments.

In the end, collaboration for M&E organizations is crucial but data risk is large. However, PCoIP technology provides a critical additional layer of protection. With it, organizations can work collaboratively from anywhere in the world, confident that sensitive information won't ever leave the data center and work can never be lost or stolen.



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MESA Members know the importance of data & analytics

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Intelligence is at the
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CONVERGENT Continued from 53

application testing to be carried out to provide assurance that their content is being handled safely.

Will remote production return to more traditional methods post pandemic? There are mixed views on this, as there are pros and cons of both options. Some technicians think that mainstream productions will return to normal, but edge cases like short-form and multiple location filming will stay remote. Filming in different locations where the first unit director can watch what the second unit director is doing provides more control and significant cost savings on travel and expenses.

The downside of remote production is that bandwidth costs can be very expensive, depending on the configuration, and video quality is inconsistent for remote collaboration where you are dependent on local bandwidth speed. Remote production also creates challenges from a security perspective. We typically think in terms of firewalls as our main defense. However, there is no perimeter with a remote workforce. Endpoints have become our perimeter. Therefore, we must protect workloads — anything that combines compute, storage, and network connectivity. At a minimum, Convergent recommends the use of VPNs, multi-factor authentication,

mobile device management, network monitoring, vulnerability management, least privilege, and security awareness training.

We all now have the benefit of hindsight and the opportunity to step back and rethink security so we can improve our on-premises and multi-cloud environments while supporting innovation. This article is only the start of the conversation. To improve security within our industry will require education and collaboration between creatives, production technologists, infrastructure vendors, and content protection professionals. Adam Slohn, CEO of Dark Fiber Production Technology, said: "At the end of the day, they're going to work, they're going to edit, they're going to do visual effects with or without us (content protection teams). And we can be relevant to them by giving them something that's more secure than nothing, or we can be irrelevant to them and give them some solutions that are the most secure thing in the world that they can't afford or can't be implemented."

Convergent recognizes this paradox and welcomes the opportunity to collaborate with the industry so we can solve technology and workflow challenges together to achieve secure innovation.



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is also powerful. For example, the software supplier can provide in-product notification via a "What's New" area of the interface when new functionality becomes available. Somewhat more subtly, anonymized data collected by a SaaS platform can inform the evolution and continuous improvement of the software. It's now possible to see which features are actually used, what kinds of files are involved, and where bottlenecks might be occurring. There's huge value in the collective learning and optimization enabled by access to data from a very large pool of cloud-connected users, particularly if those users have shared interests within a vertical market. This data-sharing capability is especially useful in the media industry, which operates as a vast ecosystem of interconnected supply chains.

THE STATE OF PLAY IN M&E

Signiant introduced the first true cloud-native SaaS solution into the media supply chain back in 2012 with the launch of Media Shuttle. That same SaaS platform now supports multiple products and connects more than 50,000 media and entertainment companies around the world. We have been on a shared journey with our customers to re-define the relationship between our companies for the SaaS era, and Signiant's experience with the growing interdependence has generally been very positive. We know we have to deliver every day to earn the high renewal and growth rates fundamental to our success, and our customers take the partnership seriously too.

The knowledge-intensive, relationship-focused nature of the hyper-vertical M&E technology market lends itself well to this new framework. Our most sophisticated customers have taken the lead in putting greater definition around our status as a strategic supplier, and they're working with us to increase the cadence of engagement at all levels. They lean into the increased mutual dependence rather than shying away from it, and they actively pull us into new models of collaboration and communication.

With SaaS, the customer-vendor relationship is changing in ways that benefit media companies, the software suppliers that serve them, and the industry as a whole. Not all of the changes buffeting the industry in 2021 are positive, but this one definitely is. H

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that involve uncompressed 4K video streams, which can require 1.5 GB-a-second of network bandwidth (or more) to play back properly.

Historically, post facilities have implemented complex storage systems and networks to deliver on these high-bandwidth needs. Leveraging common media usage patterns, however, has enabled cloud-native services designed to meet the needs of high-speed, low-latency, shared storage such as Amazon FSx for Windows File Server. This storage service provides fully managed, highly reliable, and scalable file storage that is accessible over the industry-standard Server Message Block (SMB) protocol. Services like this are allowing multiple users to connect to the same file system simultaneously for a truly collaborative production and post experience.

Amazon has a robust partner network (APN) shifting familiar storage systems to the cloud to meet your media needs. Qumulo and EditShare are great examples of cloud-based network attached storage systems that are highly-performant. These file systems can also be interlinked with an on-premises existing cluster, enabling replication for hybrid workflows.

ADDRESSING STORAGE DEMANDS FOR MEDIA PLAY-**BACK IN THE CLOUD**

For real-time media playback, a file system storage service is preferred, as most non-linear editing systems (NLEs) are designed to interact with them, and they provide the required throughput. Amazon's Simple Storage Service (S3), for instance, can be used as an ingest point for a DIT on-set to upload and deliver cuts to the studio, or to share content with other post facilities located around the world. When a project concludes, the object storage bucket can be used to archive content to cold storage with a button click. No need to copy the data back onsite to your local tape library, as the data is already in a cost efficient storage solution with near perfect durability.

ENSURING A SECURE WORKSTATION

Security is a top priority at AWS, and the core AWS infrastructure is built to satisfy the security requirements of creative workflows.

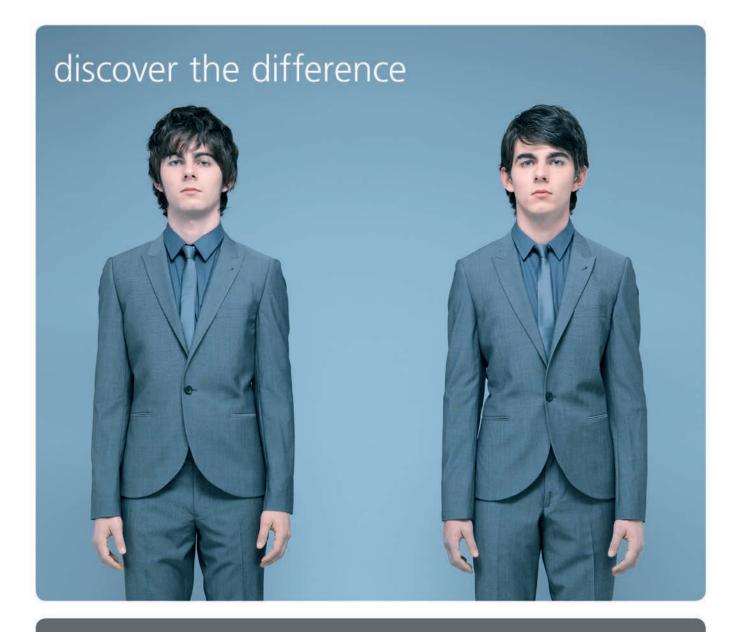
Many production and post professionals have maintained their data on premises, but that standard is quickly shifting. With the cloud, facilities retain full control over their proprietary data and software tools, and can easily lock down access to only authorized personnel or create a virtual private cloud (VPC), a space in the cloud carved out just for one individual to work in. A facility's network can even be extended into the VPC as an extension of an editor's existing

ASSEMBLING THE VIRTUAL WORKFLOW COMPONENTS

In a cloud workflow, content acquired by cameras on set is uploaded directly and securely to Amazon S3, and immediately searchable in a centralized database so that editors can immediately access the content and edit it on virtual workstations to keep pace with production schedules. When the storage solution is linked to a high-performance file system, content will be available right away for editing on a virtual workstation. This setup eliminates the need for the DIT to create multiple disparate copies of the media and allows footage to reside in a secure bucket. All downstream teams can then instantly have read access to the footage, which is crucial as editorial starts to pull the dailies, and the raw camera footage is archived.

The editorial team can edit footage with their preferred NLE running on a virtual workstation, and since the content is centralized, the editor can work on the cut in one location, while the assistant editor simultaneously accesses the same content to prepare a reel from a different location. As the post team reaches crunch time, additional remote editors can be brought on board and properly equipped with the push of a button. The time to deliver to vendors, contractors and customers is improves significantly with the cloud, as data packaging and transferring is minimized, and professionals are able to do so having the peace of mind knowing it's protected by industry best security.

From creating a feature file, to editing a video blog, it's clear that cloud-based tools from technology developers like AWS can help accelerate the editorial timeline.



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cloud-based post-production wasn't always the easiest sell, with the notion of such a thing at a bit of a slow ebb — the community was kind of moving in that direction, but at a rather deliberate pace. For a post-production facility like DigitalFilm Tree, our pre-existing cloud-based remote services for production and post were mostly for the few clients already working from home (or the Angelinos who simply wanted to avoid the 405). It was all rather novel until March of 2020, when the need for home-based workflows absolutely exploded overnight. The sudden reality was that everyone in our industry had to be at home, and so we took it upon ourselves to expand and support what we were already doing for our few remote clients and provide that for everyone — not just creatives, but other vendors in the areas of networking and home security.

Essentially, the time and energy we had invested for the last several years in things like cloud-based workflows and security, and allowing clients to store their camera raw on our private cloud, left us in a position to pivot to this new reality. All of a sudden, when we had to solve networking and security for professionals at home — literally thousands of people transitioning from sets and studios to homes and apartments — our experience in providing those workflows and cloud-based security to a select few, allowed us to provide them to many. And it puts us in a position where we can more easily spread the word about the importance of cloud workflows, because everyone needs them now. It increases efficiency exponentially. Camera raw payloads can be downloaded to a home set up with an enterprise router while the user is sleeping, and be ready and waiting before work even begins the next day.

Further, these cloud-based workflows that exist now out of necessity will, I believe, continue out of preference. There has been a large-scale behavioral change for our industry, with many having adjusted to working from home, and preferring to continue that way. Workflows have been forever altered because of it, and going forward I think a large portion of those who can work from home voluntarily will continue to do so. And because of that, cloud technologies will be a part of the "industry equation" for the foreseeable future.

As we endeavor to define the new normal and validate the best path forward, our industry's collaborative innovations in the face of the pandemic will long outlast the pandemic itself. The advances in virtual production that were borne out of necessity will provide filmmakers with an all new set of tools after helping them return to

These advancements have created new tools and more efficient workflows, they have changed the filmmaking process, and they highlighted the need and importance of secure, cloud-based networking and security. Though created and developed during a very tumultuous present, these ideas and workflows are paving a secure way to our industry's incredibly bright future.

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performed over time and when the migration occurs. Migration — of both storage media and file formats — is a fact of digital life and planning for it should be part of a digital preservation strategy. Successful storage media migrations will be helped if the files' checksums were verified after writing to offline media prior to storage, and open file systems are used in writing the data to storage so the files are not locked in any proprietary software.

LEVERAGING CLOUD STORAGE FOR AGGREGATION. REDUNDANCY AND REMOTE ACCESS

In general, cloud storage offers a number of benefits for media organizations. First, the cloud provides on-demand scalability. When a new production project kicks off or a new media library is acquired that stresses the capacity of existing storage infrastructure, the cloud provides immediately available and limitless capacity. Second, cloud storage also provides financial flexibility and reduces capital expenditure outlays. You pay for what you use on an operating expense basis, which is very helpful when projects ebb and flow and workloads are constantly changing. There's no hardware to procure, install, power and maintain. Lastly, cloud storage provides remote accessibility to content from virtually any location with a decent network connection. And if using a hot cloud storage service, all content is immediately retrievable for review and repurposing.

In digital preservation, cloud storage also serves as an effective

complement to the storage of offline media such as LTO tapes in highly secure vaults. Unlike the days of collecting up film reels and video tape cartridges for review and restoration before archiving, digital archiving involves the collection of data files. At this stage, cloud storage becomes a very convenient location to aggregate all the material considered for long term preservation. Digital files can be sent securely from various locations over the Internet or private network connections to a common cloud account and then be reviewed and organized remotely before committing assets to preservation processing and offline storage.

The cloud account can also serve as a secondary copy of the offline archive that can be readily accessed for review, clipping or re-release. Depending on the circumstance, a new project could be initiated using the cloud copy or by restoring the "truth" copy from preservation.

CONCLUSION

As with anything in the media world, change and technological evolution is an ongoing reality. Yet the need to preserve valued digital content, in any medium, is of critical importance for perspective and appreciation. As the archival adage says, "Preservation without access is pointless." With thoughtful planning, hybrid storage architectures can be deployed so both active access and long-term managed preservation can be achieved to protect fragile digital content for future use.



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only vanilla performance for specialist media production. The same software that optimizes on-premise storage can be run on cloud storage, bringing the same high performance with the added operational efficiency of utilizing (and paying for) only what is needed. No need to pre-plan purchases or have systems sitting idle. Expand and contract your operation on the fly.

4. Well-crafted software ensures seamless security between all versions of media, wherever it is, keeping complexity away from users: Security of the content is critical and for most media professionals, it's the number one concern.

An advantage of most public cloud environments is there are significant built-in security options that come at considerable cost and complexity to implement in an on-premise network. From encryption at rest for archive and online storage, to fine grained network level access control, from web application firewalls (WAF) to advanced intrusion detection, from hardened operating system images to distributed denial of service (DDoS) protection. These features have been developed to meet the strongest of security requirements and proven out for many years in video distribution systems. Following the best practices and getting a full review (e.g., an Amazon Web Services well-architected review and penetration test), will ensure that content is safer in the cloud than anywhere else.

5. Edge computing will lower latency still further and make the cloud experience virtually indistinguishable from on-prem except better: The trends are towards a cloud experience that not only matches "traditional" on-premise effectiveness, but exceeds it in almost every way. Much of this is driven by wider trends in the communication and computing industries. But for media industry users, there will always be companies working on additional layers of functionality and optimization to make the overall experience desirable and productive.

Edge computing and 5G will only add to this and as they roll out over the next five years, it's likely that the cloud will become the default choice for forward-looking production companies — if it hasn't already.

ONE FINAL BENEFIT OF THE CLOUD: IT BECOMES BIG-**GER THAN THE SUM OF ITS PARTS**

When the cloud started to become a viable option for video and film production it was quite justifiably seen as an experiment. There was no settled best practice and technical obstacles limited use cases to very small and specific parts of the post production spectrum.

This has all changed. The media production ecosystem, provided by companies like EditShare, has optimized the "basic" offering of the cloud to the extent that is now possible to carry out full resolution, online production and the range of services and functions is growing exponentially. This huge rate of expansion is not — as it might seem intuitively — chaotic or disorganized.

The reason for this is that software vendors have seen the potential and the massive opportunities of open APIs: stable and published interfaces that, used well, can make the cloud bigger than the sum of its parts. No single company has a monopoly on innovation. There will always be a greater good that is reached by having an orchestra of players working together to the same beat. **H**

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cable, broadcast and streaming platforms as well as the audiences watching those programs. Share of Screen and audience metrics are compared to the diversity of broader society to illuminate how well the entirety of the U.S. audience is represented in content and how audiences respond to on-screen talent.

Fueling Inclusion Analytics is Gracenote metadata which enables creators and distributors to better understand the aspects of a program's story, cast or characters that are driving audience engagement and therefore ratings. This data also holds the power to help combat bias in content development, acquisition, distribution and merchandising as well as create new opportunities to institutionalize equity and inclusivity into company workflows, operations and decision-making.

Now and going forward into the future, the need for representation of different identity groups in entertainment content is more critical than ever. Not just to diverse audiences which are actively seeking programming that reflects their experiences and exposes them to the realities of others. But also to the entertainment indus-

try which is continuously challenged to create and deliver resonant content. By bringing to market programming which hits home with an increasingly diverse population of viewers in authentic ways, the industry opens new opportunities to drive connection and engagement.

Featuring a racially diverse cast in a fresh new way, Bridgerton broke through barriers in terms of representation in period content. Because the show's themes, settings and importantly, it's cast resonated broadly with viewers, the creators were rewarded with a large and diverse audience.

In the big picture, what's possible for period content based on inclusivity is also possible for all other TV genres and entertainment formats. When we reach the point where creators understand what Shonda Rhimes clearly does, we'll take a step towards more representative content. At that point, our industry will be one step closer to meeting the wants and needs of its consumers. And a more equitable future for society at large will be in sight.

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