

OVER THE TOP

VIDEO
Executive

Magazine

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Spring 2019

Inside the OTT Tornado

A Whirlwind of New Devices, Apps, and Content Batters Consumers

Is TV Still the Hearth?

The Screen-Per-Person World Changes Everything

OTA and OTT BFFs

A Roll-Out Plan for ATSC 3.0 NextGen Broadcast

Does this OTT Make Me Look Fat?

Plus-Size Service Launches Abound

What Am I Thinking?

Can AI Read Our Minds and Improve Our UX?



Executive Q&A



Guido Meardi, CEO & Co-Founder
V-Nova



Ramon Duivenvoorden, CCO
24i Media



Ivan Verbesselt, SVP of Marketing
Nagra



Mike Palackdharry, SVP of Strategic
Solutions, **Limelight Networks**



Gideon Gilboa, SVP of Product
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OVER THE TOP

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The Age of Plus Upon Us

By: Kurt Michel

Welcome to the Spring issue of OTT Executive Magazine, or as folks here at Trender call it, the NAB issue. When Brian graciously offered to have me write the intro to this issue, I of course accepted. But then came the inevitable question: what to write about? As I thought about an appropriate theme, it occurred to me that we are currently surrounded by something I call the “plus” phenomenon. Follow along and see if you agree.

Recently, Apple announced Apple News+ and Apple TV+. For Apple, “plus” is not altogether new. It began in 1986 with Macintosh Plus, and along the way, we’ve seen iTunes Plus (higher quality AAC codec without protection) and iPhones 6/7/8 Plus (bigger hardware). Now it appears that they are embracing “+” for their latest subscription-based services.

The rumored new Disney direct-to-consumer (D2C) service is currently being referred to as “Disney+”. It remains to be seen whether that will be the official brand.

These premium OTT service names follow the lead of Hulu’s first subscription service, Hulu Plus. The “Plus” distinguished their subscription service from the “Hulu” free service. However, in 2015, Hulu dropped the “Plus” branding.

I’m sure the folks at CANAL+ are feeling pretty flattered at this point.

As I look at this, I’m seeing a pattern in the OTT subscription world. Maybe “+” really should be translated as “\$”? This might also explain the demise of Google+ (RIP). Could it be that naming something with a “+” suffix and offering it without a user charge created too much cognitive dissonance? (Is there a potential marketing PhD thesis here?)

Then we have the video playback device hardware: Roku (Express/Premiere/Streaming Stick) +, Samsung Galaxy S10+, Nokia 7 Plus, Sony Xperia 10 Plus, LG Q7+...I’m sure I’m missing many others.

I would have praised Amazon for its immunity from plus-ification– The Kindle/Fire devices avoided it (albeit in favor of “HD,” but I’ll save the HD rant for another day, and maybe include “turbo” in that discussion too); but they have finally succumbed, with Echo Plus.

And it goes even further: LTE+ (a better wireless), Playstation Plus (subscription gaming), Adblock Plus, Nike Air Max Plus, and more. Clearly, all of these brands are not just using “plus” to mean more. They want it to be perceived as *better*. (I hold onto this belief most fervently when I am in the plus-size section of the clothing store.)

I think you get my point. We are awash in PLUS!

Which brings me to my real point. Rather than fighting the “plus” phenomenon, Trender/OTT Executive Magazine has



Kurt Michel is Executive VP at Trender Research. He has over 30 years’ experience in telecom, datacom, and networking - in development, sales, product management and marketing roles. His marketing leadership experience at Akamai, IneoQuest, and SeaChange gives

him a unique, multi-faceted perspective on the volatile video industry.

decided to embrace it.

To support that point, I present exhibit 1: This issue has twice as much content as any prior issue, and it covers a lot of OTT topics. Our guest writers represent all areas of the OTT industry, from service providers to content producers, workflow vendors to network platform vendors, large multinational brands to startups. They are all here, bringing something for every reader.

For Exhibit 2, I submit myself. Brian felt it was time to take Trender and the OTT Executive brand from its already highly-regarded industry position to the next level, and he began looking for someone who could help him do that. Serendipitously, I was at a career crossroads during his search, and he convinced me that with a little bit of help, Trender/OTT Executive could evolve to offer greater value to the OTT community. Having been a Trender customer while leading marketing activities at Akamai, IneoQuest, and SeaChange, I already knew that Brian offered great products and services, and held himself to very high honesty, quality and integrity standards. I also saw ways that I could complement what he already offered through my engineering development background and customer-side experience. So here I am at Trender, writing this introduction.

If you made it this far, I will make one commitment to you here and now. We will not be adding a literal “Plus” suffix to any of our brands. But as we evolve and grow, we want you to feel like it is there. Feel free to let us know any time, one way or the other. Let’s Dream and Stream! □



What Is the Best Recipe for Great OTT Success?

By: Chris Wagner

Are you happy with your current OTT service? With so many OTT services on the market how can you use technology to better compete for viewers, subscribers, and advertisers? Now that consumers have so many choices, and research tells us they only want to spend money on two to three OTT services - will they pick yours? And to top things off, free advertising-supported OTT services are gaining traction in the market... think Pluto TV and the Viacom acquisition. How about the latest announcement from NBC and their future AVOD offering?

There is so much content out there. So, what is the secret sauce? Can you better leverage technology to play a more efficient role in finding and keeping subscribers and viewers?

Here is my recipe for keeping your technology costs down, ensuring the delivery of high-quality video and making sure you leverage your viewer's "watch data" to keep them happy.

My ingredient list for great OTT success:

- **Great Content.** Let's face it, video content - in all its various forms, live or on-demand, is certainly king as your first ingredient. Good content for large or small audiences is the fuel for your OTT service. Whether your OTT service focuses on entertainment, movies, sports or live events, content encourages viewers to engage with your brand. This engagement offers monetization opportunities.

- **Delivery.** Once your live and on-demand content strategy is underway, the delivery of high-quality video to your audience is the second key ingredient. How important to the consumer is the quality of your video delivery? Just look at these numbers. U.S. digital video viewers stop watching a video when they encounter streaming issues. It has been reported that 85% of viewers stop watching if the video stalls or rebuffers. The same 85% say they stop watching a video if the load time is too long. And finally, 57.3% stop watching if the picture quality is poor. Video delivery should include encoding and transport processes that can support 720p, 1080p and up to 4K video and Ad cues should be included, plus closed captioning. All

delivered using an adaptive bit rate practice.

- **The Business Model.** Now that your video content is being delivered, your OTT service needs to return value for your investments. So, let's pick the right money-making strategy. Based on your content strategy you should have a hybrid marketplace approach to connecting with your audience. Leverage SVOD, AVOD and transactional to get the most out of your content library. Your marketplace approach should allow for the packaging of channels and content in any combination and monetizing that content in a variety of ways across both local and international markets. Your OTT service should be flexible enough to create and publish subscription and pay per view (PPV) transactional products and packages, localize the products for multiple regions and languages, and manage regional pricing and promotions.

- **Pick the most popular devices for streaming.** So now let's pick the device coverage plan and strategy. When a viewer watches content on more than one device, lifetime value and retention rates increase drastically. When your OTT service is available on all the major device categories your marketing efforts should be focused on content viewing on more than one device. OTT audiences and subscribers should be measured across device categories. Customer loyalty, customer lifetime value, and higher conversion rates can be achieved by delivering relevant marketing campaigns and audience activation initiatives for multi-device engagement.

- **Keep your viewers engaged.** Help your viewers easily find and choose content from your library. Use technology to drive simple search, recommendation, and content curation. Your service should be more than a video player that just streams the content. Personalization and personally curated libraries are important.

- **Become a "data freak."** The velocity of data is increasing and will always increase. Estimates suggest that global traffic will increase three times by 2021, while the number of global internet users is expected to expand from 3.3B in 2017 to 4.6B (58% of the world's population) by 2021. Video



Chris Wagner is a technology expert who partners with investors, executives, and entrepreneurs to grow their professional brands, revenues, and customers. After spending more than a decade in the video

internet streaming industry, Chris has developed an uncanny ability to start-up new technology businesses and enhance existing enterprises through digitally enabled services. He co-founded internet start-up NeuLion and helped grow the business to \$100 million dollars, which sold to Endeavor for \$250 million in cash.

consumption, one of the largest data uses, will grow from 73% of total IP traffic to 82%, reaching 3 trillion internet video minutes per month (that's 5M years of video each month, or 1M video minutes per second). So, know your data. Knowing the "watch data" of your viewers in now more important than ever. Your OTT service should generate and collect data across your services. It should also collect customer profiles and subscription data as well as transaction data and methods of payments used for those transactions. External data should be collected about your subscribers from Facebook, Amazon and other external data sources. Device usage metrics, data collected that represents the quality of service and quality of experience your OTT service is delivering, is all important in finding and keeping viewers.

So now you have the ingredients of a successful OTT service. Great food is created with great ingredients and great chefs. Consider this; the U.S. market leads the world in adoption of OTT services with 70 percent of its broadband households subscribing to at least one OTT service. Transform your OTT tech stack and get all of the above ingredients working together. What's a great OTT outcome? The integration of digital technology into all areas of your business, fundamentally changing how you operate to deliver value to your viewers. It's also a cultural change that requires OTT service providers to continually challenge the status quo, experiment, and get comfortable with failure. Let's make things happen! There are lots of great OTT chefs out there! □



Is TV Still The Hearth?

How a Screen-Per-Person World Changes Viewer Experience

By: Stephen Johnson

At first glance a typical American living room in 2019 looks nothing like it did 55 years ago when millions gathered around their hearth-like televisions on a Sunday evening to watch four mop-topped young British lads perform on the Ed Sullivan Show. Nostalgia aside, the powerful – nearly ingrained – experience of household members gathering around a glowing TV and sharing the same experience dictated much about how the TV business itself evolved. From its earliest days, ratings, advertising models, and of course the long-running idea of “prime time” trace their roots to this simple ritual from whence we derived the term “broadcast.” Everyone had the same experience – so much so that when emergency services or presidents wanted to reach as many people as possible, they “interrupted the broadcast” so everyone could hear their important messages.

In an OTT world this isn’t *exactly* how we “watch TV” anymore – even hugely popular, widely-shared programming. The numbers tell a particularly stark story: video traffic on mobile devices (a reasonable indicator for individual viewing) continues to rocket upward, while standard pay TV audiences commensurately decline. Of course these trends have hardly escaped the notice of the largest content providers and distributors – increasingly the same companies – who, in the next year or so, plan to roll out a dizzying array of mobile-friendly streaming services. If you haven’t yet heard of products from Disney (“Disney+”), AT&T (“WarnerMedia”), Viacom, NBC Universal, Apple and others, you soon will.

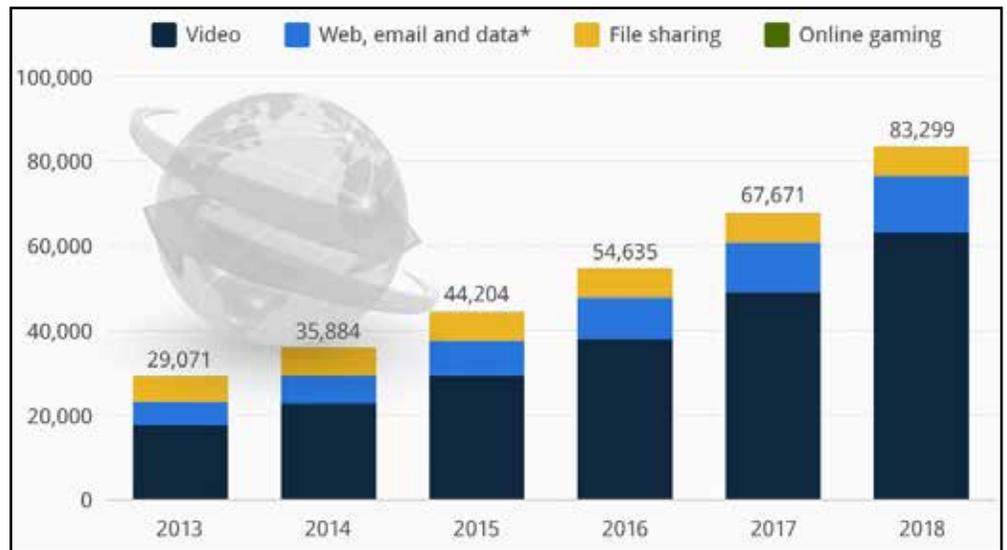


(Photo: LIFE)

And yet, as we’ll see, even with these massive investments in OTT and corresponding increases in individualized viewing, the hearth of old hasn’t really gone away. Good content still attracts a wide audience, some even in the same household. But the shift is unmistakably real and will require examination of new business and advertising models. Whether individualized viewing feeds the growth of streaming services or vice-versa, the experiential consequences of the result are wide-reaching.



Stephen Johnson is an independent analyst specializing in video advertising technology and design for media distributors. He established his consultancy, Coach Media, in 1998 to provide services in user experience design, information architecture, programmatic advertising, and intellectual property creation and advisement to clients worldwide.



Monthly Mobile Consumer Data Traffic (in Petabytes) (Sources: Cisco/Statista)

From Screen to Touchscreen

As personal tools literally made for interaction, the phones and tablets streaming OTT content rarely sit still. Unlike the “lean back” experience with a large distant screen, a mobile device offers an irresistibly tactile set of interactive tools to either play with the content directly or share it with everyone you know. Since most apps weren’t especially designed with streaming in mind – indeed, to them video is merely another flavor of underlying media – they’ve honed viewer engagement for its own sake. Since there’s an app for nearly everything, interactivity is never far from the experience – even the highly personal one of watching a program or video.

But beyond providing more fodder

for social media applications, what does interactivity offer and how does it commensurately change the viewing experience (on any device)? No doubt the aforementioned distributors and studios have a few ideas, but their acknowledged rival might have a jump on them for creating a new (or rather, resuscitating an old) model: viewer-directed narrative has been recently showcased by Netflix’s ‘Black Mirror: Bandersnatch,’ allowing over a trillion unique permutations of the same story and inviting interactivity at every turn. While it’s possible to imagine a roomful of viewers “playing along,” this experience appears particularly directed at individuals. Viewer response so far as been positive enough that the studio isn’t overly concerned with older devices



(Courtesy: Netflix)

being unable to support the technology¹.

Short Attention Span Theater

Probably not unrelated to interactivity is the average length of programming watched on individual devices. Shows longer than 10 minutes don't even capture half the mobile audience (compared to over 80% for the same length on connected TVs), suggesting a strong emphasis on short form content (e.g., "clips"). This trend hasn't gone unnoticed by producers², but advertisers have largely not bothered to shift their models. Pre-rolls and bumper ads remain the distraction of choice for nearly all SVOD services. And while mobile hardware logistics could be driving much of this preference – who wants to watch a three-hour movie on a phone? - the difference between devices remains clear: mobile watching means shorter watching.

I'm Talkin' to You

So unavoidable ads still introduce programs (or even clips), but are they at least relevant? The long-sought promise of individual ad targeting has almost certainly been oversold from a broadcast perspective, but individualized viewing has effectively solved the targeting part of that equation by definition. Quietly slipping through a technology world newly obsessed with privacy, streaming services (with the help of new standards like ATSC 3.0) plan to target viewers like never before. Where broadcast media can only aggregate an audience or anonymize an audience of pay TV subscribers, OTT viewers in a broadband world are relatively fair game – not least because, as noted above, they're simply interacting with an app and not "watching TV" as traditionally understood. Social networks, as might be expected, have embraced viewer targeting with particular gusto.

As targeting occurs within a household and identifies individuals through their personal devices, new connections and opportunities start to emerge. Customized experiences become possible, but so do

new demographic group profiles based on a more accurate knowledge of all household members. And ad-tech-friendly protocols like MPEG-DASH support this model by allowing for alternate airings within the same avail and programming, effectively customizing the ad (and sometimes even the content, see above) for each individual. From at least the advertising perspective, "watching" very soon may no longer be a common household experience at all.

From a Single Hearth to a Network of Warm Bonfires

Resurgent interactivity, a preference for short-form content and being targeted by personalized ads look like natural outgrowths of individualized viewing. But, does that mean every aspect of the common TV viewing experience is gone? Is the old glowing TV hearth on its way to (literal) extinction?

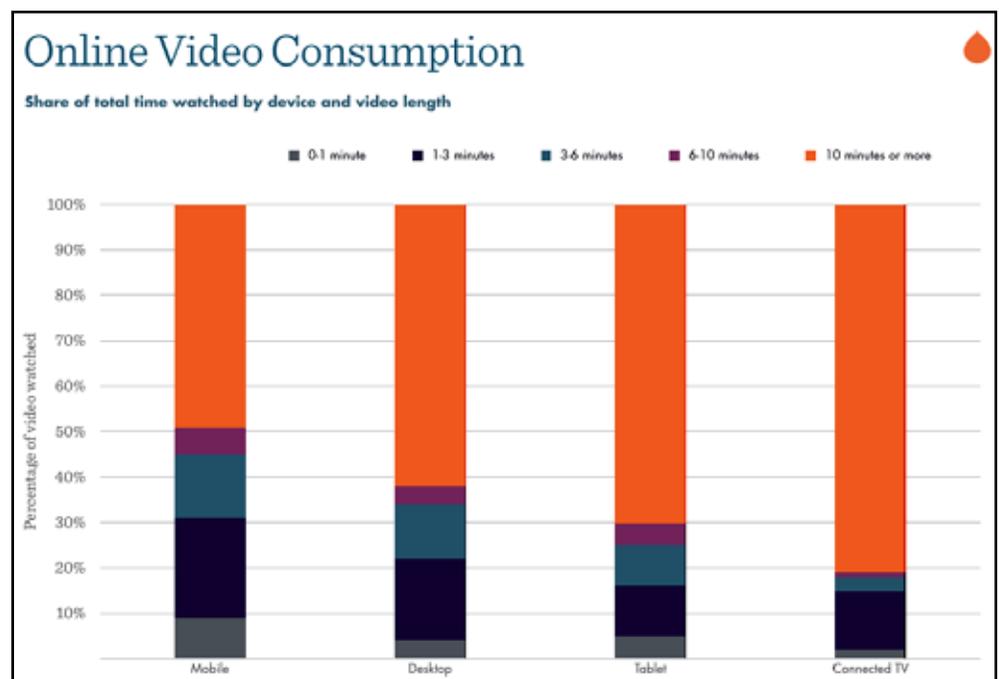
These trends appear irreversible but individualized experience doesn't necessarily mean solitary experience. Mobile users are clearly attached to their own devices and consume video content on them as easily as any other activity; but evidence suggests that hardly means they refrain from sharing the experience or otherwise being part of a crowd enjoying the same program. Ironically, the same interactive tools that immerse mobile users in customized content also allow them to revel in just how many other users are sharing the same thing. Redefining the group with whom we're watching doesn't make watching any less intimate; indeed, a realization of collective watching deeply

personal content may make it more so.

And while it may appear a bit cold to replace gathering around the TV with interacting over an electronic network, it's worth remembering that the latter remains connected to a significantly larger, ever-evolving world of experiential possibilities. The vaunted "internet of things" may not be realized just yet, but other connected devices in the home – including voice-recognizing speakers, cameras, thermostats, even humble phones and TV screens – are neatly supplementing and complementing OTT services. If the simple experience of gathering around a TV expands into participation in a global, immersive, multi-sensory, personally tailored yet widely shared experience, it'd be hard to argue we'd be the worse for it. □

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Online Video Consumption (Source: Ooyala)



Consumers and Their Devices: TV in the OTT Era

By: Charlie Nooney

It's no surprise that consumers are interacting with content and their connected devices in ways that would have been unimaginable even a few short years ago, making OTT the preferred method for accessing content. In order to predict the path this evolution will continue to take, we must also begin to rethink our current assumptions about the consumers, their devices, and the content itself. In the rapidly evolving world of TV providers, understanding that "content is king" will be essential to delivering the service consumers actually want. This upends the traditionally held notion that viewers will come to the content if they want it. Today's new reality is that viewers want the content that they want to come to them, and providers that can do this in the most convenient manner will come out on top. To fully understand, we need to take a quick look at how devices have evolved – and the resulting behavior changes in consumers.

The Evolution of Devices

For decades, the terms "television" and "TV" interchangeably referred both to the device used and the content itself, but those days are long gone. As the capabilities of TVs expanded, so too did the number of options for content. During this time a similar evolution occurred with phones; now, the number of calls made with smartphones is actually dropping, with more people indicating that their device's ability to connect to the Internet is a more important feature.¹ The same thing occurred with gaming systems and accessing content on the Internet – more and more options for accessing content are available than ever before, making how consumers access that content less relevant.

While these devices have become much more versatile, we have also seen the introduction of inexpensive streaming devices for TVs which can access content easily and from anywhere. These can be purchased virtually anywhere, connected within minutes and provide ubiquitous access to a huge variety of content services. In this world, the device itself is a secondary concern. Users no longer care *how* they access the content they want; they are far more interested in *how easily* it can be

accessed from the myriad of devices they may want to use.

The Current Dilemma

So, while we have come a long way in terms of how much content we can offer consumers, there is still much that can be done to simplify and enhance the user experience. Today's content ecosystem is, for many individuals, a complex web of sometimes overlapping subscriptions, which may or may not also include traditional cable. This is further complicated in homes with multiple user profiles, especially if the viewer happens to forget one of the passwords.

And while some content is shared across many streaming services, other content may be exclusive to one service or another, meaning that the user is often forced to have multiple subscriptions—or even different devices—to access all of the content they want. Searching for a particular title may or may not require accessing several platforms in order to find it. In sum, today's viewers



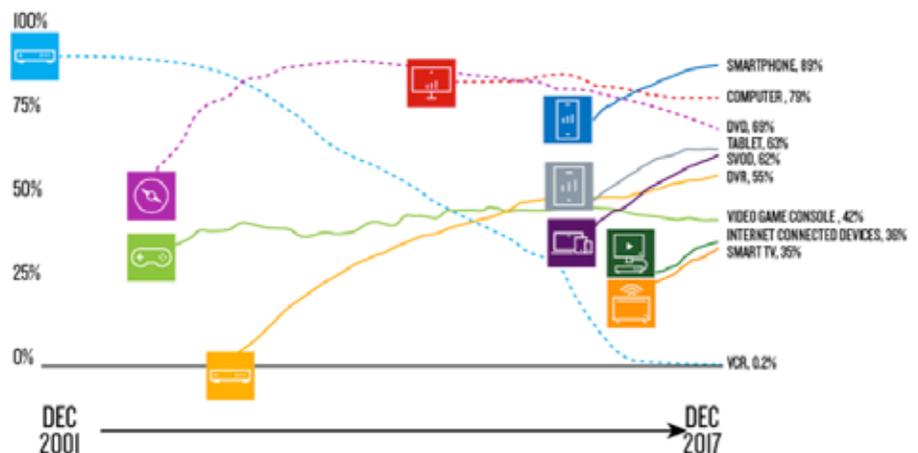
Charlie Nooney is Chairman and CEO at MobiTV, Inc. He's a seasoned media executive, with a career dedicated to connecting media and mainstream brands with consumers through emerging technologies. Prior to his role at MobiTV Inc., Nooney has also held previous leadership positions with companies such as The Walt Disney Company, where he served as executive vice president, as well as Chairman and CEO at Premier Retail Networks; and President of Broadcast Services and Out of Home Media at Thomson/Technicolor.

can access more content than ever before, but given the multitude of options, it's not always easy to access, and the experience can leave many of them frustrated.

The Modern Consumer

These are just some of the pitfalls many current viewers typically face, but

UPWARD TRAJECTORY: 15+ YEAR GROWTH TREND OF CONSUMER DEVICES



Source: Nielsen

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when we begin to think about future trends and demographics, it becomes easier to understand how OTT providers can deliver a better experience.

• **Device users are becoming more sophisticated.** They expect a personalized, user-friendly experience. Kids are gaining access to more devices at younger ages; with this level of native knowledge, they intuitively know how to work them and will show little patience for experiences that are less than ideal. Children up to age eight spend nearly 2.5 hours with a connected device every day, and almost three-quarters of that time is spent viewing TV and videos. For eight to twelve-year-olds, this figure jumps to over 4.5 hours. In addition to this, Generation Z and Millennials now make up over half of the viewing demographic in America. These users know how to use technology and want their experience to be personalized, easily accessed, and ultimately, very enjoyable.

• **Devices are becoming less expensive.** As the technological capabilities continue to make leaps and bounds while production costs remain low, viewing devices are becoming more accessible to a greater proportion of individuals than ever before. This is happening on a global scale, which means that the inherent value from viewing content will be with the content itself, not the device.

• **Mobility is important.** We are all busy, which means that a substantial portion of our day is spent outside of the home, and many individuals travel on a semi-regular basis for work. Lifestyles have adapted to increased mobility. Data is less expensive, Wi-Fi more readily available, and 5G is around the corner. People are being conditioned to expect to have the Internet and all of its conveniences

constantly available. They want to take their personalized experience everywhere they go, and will accept nothing less.

• **Subscription-based access will continue to grow.** There are over 417 million household ‘media relationships,’ or entertainment-related subscriptions, exceeding the number of total Americans. These relationships come in many forms, including Internet, Pay TV, and streaming services in video, gaming, and music.² This figure underscores the importance of the subscription model but given consumers want both simplicity and choice, the experiences around how to bundle subscriptions is a central question for the future.

• **A more connected future is inevitable.** With recent advances in the smart home arena, the widespread adoption of the Internet of Things (IoT), connected cars, augmented and virtual reality, as well as artificial intelligence, a more connected future is in the works. The genie is out of the bottle and cannot be put back in. In this increasingly connected world, users will expect continued ease of access for ALL of their content and digitally powered experiences.

• **Cable TV is still very much alive.** There are currently nearly 190 million cable TV subscriptions – although this figure has been dropping by three to four percent over the last several years.³ The bottom line is there is still a robust market for cable service. Many cable providers believe adapting to the modern world by embracing app-based delivery of content will allow them to not only maintain existing market share but grow it. This may be a winning combination, especially for consumers who prefer the simplicity and certainty of cable service and are willing to forego the possible value gains

obtained by some multi-provider mix of OTT subscriptions. In order to truly meet the needs of an evolving consumer base, these trends need to be taken into consideration and the common complaints that many users have with current options need to be addressed.

Service providers must also factor in the foreshadowed future of technology in the industry. This includes artificial intelligence (AI), virtual reality (VR), and augmented reality (AR). Leaning into virtual assistants such as Amazon’s Alexa, Google Assistant and Siri is a good place to start.

Challenges for OTT Providers

In order to truly meet the needs of an evolving consumer base, these trends need to be taken into consideration and the common complaints that many users have with current options need to be addressed.

Most importantly, users want a seamless service across all of their devices and subscriptions. This is especially challenging in environments with multiple shared devices. Logistically, it is a hassle for many viewers with multiple subscriptions to determine how to best view the content they want. In addition to this, many are paying for redundant services, since some of their subscriptions have overlapping content – especially if they currently have cable as well as OTT services. Alternating between multiple platforms and/or user profiles to search and view for content is inefficient and time-consuming.

Service providers must also consider how AI, VR, and AR will impact the market, and factor that into their strategies. This is all a tall order, but we are moving in this direction and providers that embrace this quickly will have an edge over those who continue to resist inevitable change.

Television’s future will be very different from its past. Cable service, while still prevalent, has lost its market dominance primarily because it resisted technological advances and ignored the changing preferences of customers; but it’s never too late to put users’ needs first. □

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Television's future will be very different from its past.

The Birth of a Notion: How The Preview Channel Came to Be

By: William Sager

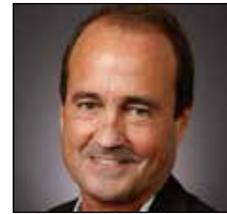
“Find something you love in life and then go after it.” – Clint Eastwood

These are indeed interesting times in the business of television and channels. My experience goes way back to the early 1990s when cable was just spreading its wings. I worked for Group W, Westinghouse Broadcasting and Cable for 8 years. One of the largest MSOs at that time, it was sold to CBS cable and eventually absorbed. It had several themed, programmed cable networks: The Satellite News Network (CNN competitor that failed), The Travel Channel, Home Theater Network, Country Music Television and the infamous ‘Z’ Channel (yes- the one that out-subscribed HBO, SHOWTIME, CINEMAX and THE MOVIE CHANNEL combined in Los Angeles).

The pay-per-view business was just beginning. I thought that was going to rule the TV landscape. It didn’t. Eight years later, I left Group W, raised \$3m and founded The People’s Choice, one of the 3 nationally satellite delivered addressable PPV movie services. My competition was Viewers Choice (Scott Kurnit, whom I am still friendly with

today) and Request TV (Jeffrey Reiss, and RTV was owned by all 6 studios). I definitely was the dark horse in this race. I got killed, just trampled. But I learned many valuable lessons along the way and also met some wonderful people who helped me negotiate the planks I had to walk at the studios to license first-run theatrical movies. I watched as the cable networks grew. And they grew quickly. And they named themselves with names that usually described what you might expect to see on the channel. For example, on The Travel Channel, you’ve got travel related programming. The same with Animal Planet - animal related. Easy to figure that out from its name.

Jump to today. A few years ago, the OTT channel business began in earnest. With the rise of broadband, the TV world figured out it could deliver a TV channel over the internet (IP) instead of broadcasting it or using a satellite up and down link to get it to a cable headend. Pay TV and cable stalled in growth. Sling TV appeared with 20 channels for \$20.00 and that was like the little Dutch boy pulling his finger out of the dyke. A whole bunch of channels appeared that were



William Sager founded one of the first satellite PPV movie services with all 5 studios aboard. He has worked with some of the largest media companies in the world from Google, Fujitsu, Hipcricket, idealab, Verizon Telecom, MGM/UA, Westinghouse Broadcasting and Cable to the legendary ‘Z Channel’. Mr. Sager recently launched ‘The Preview Channel™’ on over 100 million Smart TV’s via Xumo TV, a Viant company, a division of Time, Inc. and several other Smart TV manufacturers. In Los Angeles, he produced 26 episodes of Sid and Marty Krofft’s ‘D.C. Follies’ and six original home videos starring Bob Keeshan, ‘Captain Kangaroo.’ At idealab Mr. Sager launched 4 start-ups and produced the 1999 broadcast of the 35th Woodstock anniversary concert streamed live across the U.S. He sits on the board of advisors for Gravitare Pictures and is a member of The National Academy of Television Arts and Sciences.

delivered over IP. So I took a look at all of them last year. As of 4/01/2017, I found 119 channels offered on Amazon Channels (and that was hardly all of them out there).

Here are some of their names: Acorn TV, XiveTV, BaeBle, MHZ Choice, XTerra TV, Alchemiya, Cinepride, DekKoo, Hi-Yah, 88bb, Ameba, Herra, Panna, GiladTV, Toku + many others. Would you know what kind of content was offered on any of these channels? However, I bet you could tell me what was on ‘The Movie Channel’. Comprehend?

So, I looked around at what was carried on cable. Then I examined all of the programming carried on each of these channels whose names didn’t tell me a thing about what was on them (and yet, they all wanted me to pony up a monthly fee of \$ 3.99 for each channel). No wonder the cable/TV/broadcast business is in trouble. IMHO not all of these channels will be around for the long run. Niche is OK, but niche without a name or branding won’t work in the world of a thousand choices and constant media bombardment to the senses.

An idea began to percolate. Sitting in a movie theater bombarded with movie trailers of films opening months from now, some I’d never heard of, I marvelled at the immense production value of this content and its enormous entertainment value



Preview Channel offers movie trailers, video game trailers and even an original program called “The 1st Annual Academy Awards Trailer Show.”

– in this particular case more than the film I came to see. There are so many films, we can't possibly see them all but where to go to experience them in trailer form? At that moment I realized what was totally missing from the TV landscape - a channel that carried upcoming new movie trailers and video game trailers (the really cool CGI animated graphics kind).

I went back home, dreamed up a name, and snagged the domain which was (a stroke of luck) available. (<https://thepreviewchannel.com/>) and I set off on another channel venture. The first major challenge I faced was – how can I access the content? Although the studios and other distributors make their trailers available in a number of places and ways what I was seeking was the ability to get them all on a timely basis.

There was only one source. I formed a joint venture with the 900lb. gorilla in this space—ScreenPlay, Inc. ScreenPlay has been in this business since 1989 and distributes these assets to over 10,000 retail locations. They used to supply Blockbuster with all of their in-store TV promotions and trailers; now they supply Amazon's IMDB and others. ScreenPlay Inc. has been providing a great video service to North American businesses for 30 years, and has a library of over 200,000 music videos and film, game and TV trailers. With the launch of The Preview Channel they now extend their reach into the TV/Cable/Broadcast/OTT market.

It didn't happen overnight. In the past, I put together a PowerPoint and begged for capital. This time, I turned to my family and friends. There was no time for raising money – the TV business was moving too quickly. It has required substantial capital and sweat equity, some real trial and error, some starts and stops; but on February 15th, 2019, The Preview Channel was launched, offering movie trailers, video game trailers and even an original program called "The 1st Annual Academy Awards Trailer Show" to 35 million Smart TV sets, with plans to launch to another 65 million Smart TV sets by summer. Initial audience and advertiser response has been excellent.

The channel is laser focused on the exact demographics that everybody in the TV business is chasing: Millennials and adult males 25-35 years old. There is no shortage of brands and other promotions or products that want to be seen next to movies that are opening nationwide in theaters. Those same brands know their audience, and also realize it's the exact same audience that plays video games. The CPM's for this are off the charts - ranging from \$20-35. There's a reason you see ads for Coke and GM Trucks in movie theaters before the feature starts.

We also have Loop Media, Inc., on

board as co-owners, which is super exciting. They just launched earlier this year as an innovative streaming media company focused on premium short-form video for businesses and consumers. Their launch immediately coincided with their acquisition of an extremely valuable company, formerly mentioned ScreenPlay Inc. We have corralled and included ScreenPlays' large library of movie assets that are one-of-a-kind — exclusive to them and to the channel now. They include 50,000 classic movie trailers (from the 40s on up to present), 7,000 star and director interviews, 50,000 movie clips, 7,000 video game trailers, and 20,000 classic TV trailers.

Having them on our team lets us supplement our licensing deals with their treasure trove of content.

My second partner, Xumo TV, a Viant company and a division of Time Inc, provides our TV platform with one of the more elegant and easy-to-use, consumer-friendly formats I've ever encountered in this space. The Hollywood studios send out new content and Screenplay encodes it daily and delivers it directly to Xumo who then, using machine learning automatically retires the older content and inserts the new content into the schedule – avoiding any human hands required to run the channel. The Preview Channel could not operate at the high level it



does without the wonderful cooperation and help of the folks at Screenplay or without Xumo TV's awesome technology.

This year is going to be really exciting for us. We're about to announce our integration directly into top smart TV manufacturers and international distributors and even a return to broadcast. We have initially launched The Preview Channel on Xumo, which we expect to be followed by 4 additional launches over the course of the next 2-3 months, including Samsung, Vewd and Zone TV.

The Preview Channel is now available in over 35 million homes. XUMO is available on your Hisense, Magnavox, Panasonic, Philips, Sanyo, Sharp and VIZIO smart TVs. Channel Plus, powered exclusively by XUMO, is available for free on LG smart TVs in the US and select models of LG smart TVs in Canada.

Once available on all of these platforms, The Preview Channel will be seen on over 100 million Smart TVs by Summer 2019.



In the Spring, we will also be available internationally in France, Germany, Spain, the UK, Brazil and Italy.

We are talking with one of the world's largest mobile carriers to do a promotion with them for a launch on their handsets in August. We will be integrating an alert system for consumers when their favorite trailers debut (Star Wars, Marvel Superhero's, D.C., etc.).

You can watch the channel today using the XumoTV app on iTunes or Google Play. It is also available on Roku and will be available on Amazon's Fire TV by summer. We are also working on our own iOS and GooglePlay app as well.

We are also voice-enabling the channel so you can make requests to find certain interviews or trailers you want to see by just asking Alexa.

And, finally, very often I hear "but you can find these on YouTube." Yes, some of them, but you must know the exact title to search for it. This is a channel that offers a lean-back, watch TV experience for those who still watch TV and with the apps, the channel becomes totally interactive with a rich vault of movie and game trailers, behind-the-scenes star interviews, director interviews, and older classic movie trailers that you can access day and night for free. A true entertainment channel with a constant refreshed stream of content with the biggest stars and the highest production values. And unlike some of the other new channels out there, this one takes little to no explanation of what it is (unless you've been living under a rock). Most people know and enjoy watching movie trailers and kids and adults love video game trailers. Nothing to explain here, just a whole lot of original programming and content to watch and enjoy all year long. □

The Viewer Experience: Past, Present, and Future

Interview by Kurt Michel with Ramon Duivenvoordeni, CCO at 24i Media

Ramon Duivenvoorden, COO at 24i Media, sat down with Trender Research's Kurt Michel to share his thoughts on where OTT has been and where it's headed.

Kurt: Hello Ramon. Thank you for taking some time to speak with us at OTT Executive Magazine. As your website tells us, you “create and deploy video apps for every screen, from set-top boxes, SmartTVs and media players to game consoles, tablets and mobile phones.” What would you identify as the most significant trend or capability being requested by your customers, and how are you addressing that?

Ramon: Customers are increasingly seeing the value of being able to manage all their apps from one place. It's not enough anymore just to be able to deploy apps to all platforms on the market; it's important to have a centralized interface to manage all of these apps. Making a simple editorial change to one page of your app could take hours of updating each platform to maintain consistency or else you would be left with several different apps, all with slightly different editorial content.

With regards to the user experience itself, personalization has been increasingly important, and 24i has been addressing this by adding the ability to modify user experience based on audience segmentation. There are, of course, two sides to this - data gathering/generation and UI design. While 24i is not in the business of AI, we recognize the huge potential of enhanced metadata creation within the space and are doing everything we can to enable its use. To account for this, our Backstage system allows for a huge amount of flexibility in metadata. It can intake and make decisions on how to create dynamic groupings of content. Another part of this is serving these dynamic groupings to the right audience. It's important that audience segments be as granular as possible, so we make it easy to manage, dynamically serving the right content to the right segment.

Kurt: How have end-viewer complaints changed over the last 5 years? What were the most common complaints then, and today?

Ramon: Five years ago, the most common end-viewer complaints were poor streaming quality, buffering, live streaming, content



Ramon Duivenvoorden is the CCO at 24i Media and joined the leadership team after 24i's acquisition of Vigour where he served as founder & CEO. In his current role, he continues to focus on sustainable value creation for the company and its customers. Ramon is based out of the 24i office in LA.

availability, little or no personalization and recommendations. Today the technology has evolved, 4G and 5G are making streaming quality better and more accessible for everyone. In addition, today's end-viewers are much more sophisticated and have higher expectations and demands from a streaming service. Most end-user complaints today are on usability, latency, content, and personalization. If a viewer today sees an ad, they expect the advertisement to be relevant for them based on their needs and wants. If they see the same ad several times in a row or cannot immediately find the content they are looking for, they are likely to drop off more quickly and try their luck with a different service.

Kurt: What is the difference between “content availability” and “personalization” 5 years ago and now?

Ramon: Five years is a long time in this industry, and access to content has changed dramatically over this period. Besides the enormous inflow of short form and user-generated content in the market, access to premium content has improved drastically too. Five years ago there were a handful of major streaming services in the SVOD and broadcaster space. True OTT access for Pay Television was not widely available and many broadcasters were still hesitant to launch direct-to-consumer distribution as they feared this would undercut revenue obtained through licensing deals with Pay TV Operators.

Today, we have instant access to premium content from nearly all broadcasters on every screen through a wide variety of streaming apps. Content is available through



24i works with clients to create apps that provide a seamless experience across HDTVs, tablets, and mobile devices.

direct-to-consumer services from networks, Pay TV operators such as Sling or DirecTV Now, and a variety of large streaming services like Netflix, Hulu, Amazon or YouTube TV. With several major services still expected to enter the market (Disney, Apple), the battle for viewership in the online video market will only intensify, giving consumers more choices to cherry-pick their media spending and better access to content.

With the increased access and choice of valuable content, the growing importance of an intuitive, personalized user experience cannot be overstated. A library of 5,000 or 10,000 content items has little value when users cannot find content that is relevant to them quickly. Given the increasing competition and large amount of capital required to source valuable content, investments in personalization, high-quality metadata and a premium user experience are essential to successfully compete in the space and generate positive business results.

A specific example to demonstrate the innovation with regards to personalization is provided by Netflix. Five years ago, personalization was done primarily on the basis of the relevance of titles and genres (Netflix being a pioneer in personalization even at that time). Today's user experience is personalized to the degree that category titles, movie descriptions and artwork are all tailored to appeal to your personal tastes and viewing behavior. A romantic comedy that stars Tom Hanks might be advertised to you with artwork that prominently features the actor because Netflix knows you are a fan; while another viewer that likes the genre but has no interest in Tom would instead be served an image that emphasized the romantic nature of the movie.

Kurt: How has video app design changed in the last 3 years? Would you say the innovation is accelerating or decelerating?

Ramon: I would say that innovation is accelerating. As end-users are becoming increasingly sophisticated and demanding, the need for streaming services to offer immersive, flawless and personalized experiences continues to grow. The simplification of user journeys in video apps is an area that will continue to show much innovation and improvement. When viewers interact with streaming services, they have a particular goal (most often to be entertained). And usually, the less effort your users spend on achieving this goal, the better the user experience. Whether we are talking about cross screen interaction and enriched meta-data, voice, personalization or monetization - exciting developments are happening everywhere.

The most interesting aspect is that many of these fields of innovation have the potential to cross-pollinate each other in ways that stimulate new innovation and opportunity. For example, user interfaces that connect personal devices to the big screen can enable new ways to personalize device experiences on what have traditionally been "shared screens," while improved understanding of the tastes and behaviors of users provide a plethora of opportunities to create and serve more relevant ads or content offerings, allowing content owners to monetize services in new and better ways.

Kurt: What do you see as the role of voice in the video app user interface? Is a natural, conversational based UI the ultimate destination, or something else?

Ramon: The significance of voice as a UX paradigm will undoubtedly drive a new and important wave of innovation for video apps and software applications in general. A natural, conversation based UI is definitely in the cards, although I expect that voice will exist as an incremental UX layer rather than replacing existing paradigms completely. Voice can be especially powerful in situations where our current interfaces fall short or are too complex, such as searching a content library or browsing through an electronic programming guide.

At the same time, there will still be plenty of situations where the click of a button or a simple swipe will be the most effective way for a user to interact with the application, whether it is because they are interacting on their phone in a public setting or because the interaction is simply faster than the voice alternative. The real challenge for future application developers will be to blend different interaction paradigms across a wide range of physical contexts and screens in a way that maintains a simple and intuitive experience for the end-user. This challenge is one of the key aspects that makes it so exciting to be at the forefront of this industry.

Kurt: One of the most significant challenges in video apps we continue to hear about is managing the constantly increasing array of devices and operating systems. You just can't test every combination! How has the app development industry come to grips with that?

Ramon: While we make use of a variety of software that allows us to test on "virtual machines" during development, it is our experience that testing the apps on a large variety of real devices is the only guarantee to account for hardware issues and ensure that performance

and functionality are really optimal.

To this end, we have fully equipped test labs in our main development offices in Amsterdam and Brno to allow us to test our software extensively across a wide range of device models through both automated and manual testing before shipping. Because we use a productized development framework that reuses and unifies code and UI components across both templated and customized applications, we have the opportunity to test our apps and user interface components at scale, and then leverage the investment in our testing facilities and efforts across a large number of streaming apps and customers.

Kurt: Is there a significant difference in video apps based on global regions? For example, are the apps for North America fundamentally different from those provided in APAC or EMEA? Or do the video apps all follow a common blueprint?

Ramon: Cross region differences in video apps are mostly driven by the prevalence of different business models in different markets. For example, in regions like APAC and LATAM, most services are monetized through ads or tied-in to mobile or operator subscriptions; while the EMEA and US markets have a larger share of SVOD services or services that combine an ad based 'free' tier with subscription- or transaction-based OTT. Another unique regional UI/UX difference is the change from "Left to Right" to "Right to Left" (RTL) interfaces for apps that use Arabic or Hebrew language. While the user interface is typically mirrored in these situations, there are many small details and rules that should be taken into account in order to provide an optimal experience for end users in these markets.

As mentioned before, a good user interface should never get in the way of the user, and many paradigms that make up an effective and attractive user experience are based on universal principles of good UI/UX design. Shared UI/UX principles and extensive AB testing have caused video apps all over the world to converge and look familiar on the surface. The difference between a good and a great user experience is therefore often determined by execution and details.

Kurt: Thanks Ramon. We look forward to continuing improvements in the viewer's user experience, as you and your peers drive user experience innovation in 2019. □



Content Curation Is Key

By: Michael Nagle

With the OTT Executive Summit rapidly approaching I can't help but flashback to many of the events of previous years in the TV business.

There was CTAM (National and local chapter events), NCTA, the Western Cable Show, NECTA, PCTA and many more. If you had booth duty those events could become a challenge since there were sessions and presentations worth listening to (and admittedly – some less than interesting) and people to meet up with as they rushed from one session to a meeting or to take a call in the hallway.

If you forget the education that many attendees may have accumulated during these conferences, consider the relationships they enabled many professionals in the industry to develop.

Sure, some of the parties were excessive. If you happened to be the person setting up OR manning the booth at 8AM, getting to bed anywhere between 2 – 4AM (if you were lucky) certainly made that an unpleasant challenge. However, these gatherings often gave attendees an opportunity to meet with colleagues and influencers who otherwise would have been unreachable. They also allowed many of the participants to see each other in a very different light.

Some of the best friendships I've begun in the television business are with my former competitors. At the time we should have been sworn enemies, but somehow we all

managed to leave the competition behind as we mingled at one of the bigger soirees being hosted by many of the usual suspects (read that as HBO, MTV or Madison Square Garden Network).

One of the words that continues to bubble up in the industry is "curation," but it is in reference to content. The same word can be applied to the work you put in to beginning, maintaining and growing relationships – both personal and professional.

There appears to be an assumption that once you have the phone number and/or the email address of a target prospect that you're halfway to closing business. Try applying that theory when you go through the 200+ emails that come to your inbox between the close of business one day and the start of business the next morning. Emails from a contact you don't have history with may not even get read by many people. Consider how many other people like you might be reaching out to the same person for a similar or more urgent purpose? How optimistic are you that your approach will stand out? Was it a cut & paste message or did you really personalize your email to the person you're trying to reach?

OTT and Streaming are evolving as the space continues to thrive. Terminology changes along with the capabilities of the hardware associated with production, transport, consumption and sponsorship. How comprehensive is your knowledge on all of the changes that are happening? How well do you know the thought leaders in the space? If your business or job depended on arranging a meeting with any of the key players, how confident would you feel about securing that meeting?

When you do a bit of digging on past participants in the OTT Executive Summit, it becomes clear that this is a primer for many of the companies and professionals who are leading the industry in strategy, growth and innovation beyond the present day. If you've been to the event you also likely know that you can actually have a conversation with some of these people between sessions or during one of the networking opportunities. The trick is – you have to be there and you have to put down your phone and hustle. You won't get everyone on your wish list but you



Michael Nagle is the CEO of Ashling Digital, Inc. and has spent more than 25 years in the media business working for SONY/Columbia Records, The Box Music Network, Bloomberg LP, Playboy, FlixFling and NatureVision TV. In 2016, he became President of Get Cast, the comprehensive platform for media production, casting professionals and actors. Michael also serves as the Head of Content Licensing for Viva Live TV. Michael has managed Bloomberg's distribution and advanced product development (2000-05) as well as Playboy's sales and marketing for North America and Eastern Europe (2005-15). Home Media Magazine named him one of their "Digital Drivers in Media" in both 2016 & 2017 for his efforts on behalf of Invincible Entertainment.

will get some of them. When you do – don't give your elevator pitch. Introduce yourself and begin a relationship with a simple conversation. Ask them when it might be best for you to reach out regarding your ultimate goal. Make a positive impression.

Another good idea is to visit the table top exhibitors and collect whatever literature and business cards you can carry. If you don't know those companies you will want to make an effort to find out who they are and determine if they can help your business – or even if you can help theirs.

I would also recommend that you reach out to some of your clients and colleagues and ask them if they are planning to attend the Summit. Send them a link just in case they aren't aware that it is taking place. Bring some value to your communication with them. Ask them, "I'm planning to be there for the duration. If you're going to be there also – let's grab a few minutes or a cup of coffee during the break. I'd like to share some details with you about X, Y and Z."

There is no greater value than looking someone in the eye when you are communicating. A handshake can change a relationship. Your emails may soon get a faster response. Your phone calls will get returned quicker.

After all – curation is key. □



Over the Top and Through AI to Big Data's House We Go

By: Ted Korte

The media delivery business has become a game of seconds. The lines have blurred between broadcast and other IP-related services for delivering media, while content creation has grown from original TV series and movies to how-to videos and social media posts. Access to content for consumers seems limitless, with digital audio and video now the preferred media for nearly all of our daily activities. With so much content being consumed for a wider variety of purposes, viewing time and audience attention spans have grown shorter, making every second count.

The main contributor to the rapid expansion of content creation and consumption has been the emergence of Over the Top (OTT) delivery, made possible by broadband connectivity to a wide range of “connected” devices. This model gives consumers access, convenience and value that wasn’t available via traditional linear services. However, Cable, Satellite, IPTV and Over the Air (OTA) delivery will not completely disappear; each will find their place in this new media delivery ecosystem. For these providers, competing in this fragmented landscape will require a mix of traditional linear services alongside new OTT services, combined with a strong data-driven approach.

Content owners maintain very little control upon turning their product over to CDNs and OTT service providers for delivery. To complicate matters, they lack insight into the viewer’s quality-of-experience (QoE), as more and more third-party services become part of the end-to-end solution. This vacuum of information begs for new methods that

ensure a quality experience and proper measurement of viewer engagement.

The aggregation of quality-of-service (QoS), QoE, and viewer behavior data produces extremely large but trusted data sets. By harnessing sophisticated Machine Learning (ML) and Artificial Intelligence (AI) technologies to process this data, media enterprises can glean the valuable insights needed to improve the viewer experience. Significantly, these techniques can be used to predict – in turn allowing operators to prevent – customer-impacting problems before they occur, which is invaluable in minimizing subscriber churn.

The OTT Challenge

OTT has tremendous growth potential for the media and entertainment sector, with growth projected to exceed \$158B worldwide by 2025¹. OTT delivery can provide consumers with one-to-one, personalized experiences while offering providers the ability to collect immediate feedback. To maximize this opportunity, content creators will need to determine the right content, right duration, right time and right platform to reach their audience in real time.

Regardless of the end goal, though, the first question in any decision tree should be “Is the quality great?” Studies consistently place poor quality in the top four reasons why viewers abandon OTT video. And with short-form content consumption on the rise, even relatively brief problems become very noticeable – for example, imagine a five-second delay in a four-second pre-roll ad.

To complicate matters, OTT is extremely difficult to control end-to-end. OTA



Ted Korte is the Chief Operating Officer of Qligent Inc. He has 25 years’ experience in the Broadcast industry delivering hardware and software solutions in Terrestrial TV and Radio, Audio Studios, Contribution and Distribution, Master Control Automation, Asset Management, Video Servers, Non-Linear Editing, Quality of Service monitoring and Delivery Analytics. Ted has a passion for aligning market and technology trends with business objectives. Ted’s goal for Qligent is to help Networks, Broadcasters, MVPDs, and infrastructure service providers integrate Quality of Service and modern Delivery Analytic workflows into their organizations more efficiently and cost effectively.

broadcasters controlled the entire chain through to their transmitters, while Cable, Satellite, and IPTV distribution offered a single handoff both technically and commercially.

The picture is quite different for OTT. Payout is moving to the cloud via third-party providers, as are streaming service functions, including transcoding, packaging and DRM. Meanwhile, multi-CDN and multi-ISP solutions are becoming the norm for reliable delivery and reaching consumers on-the-go. This approach enables incredible scale and speed-to-market, but comes with a cost: loss of control. There could potentially be several hand-offs between separate third-party service providers, thus making a holistic, end-to-end data aggregation, monitoring and analytics system a “must-have” for a successful OTT channel.

The best way to optimize OTT-delivered

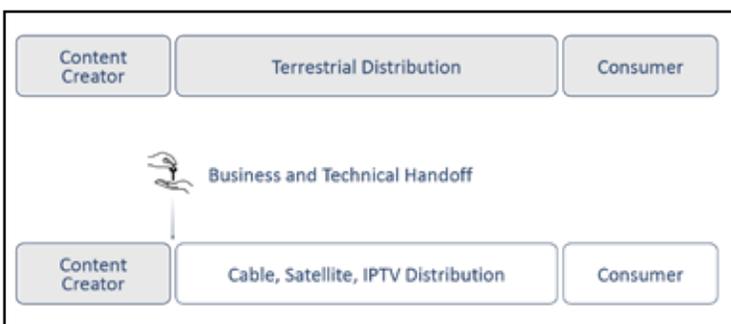


Figure 1: Traditional Linear Service Provider Mix

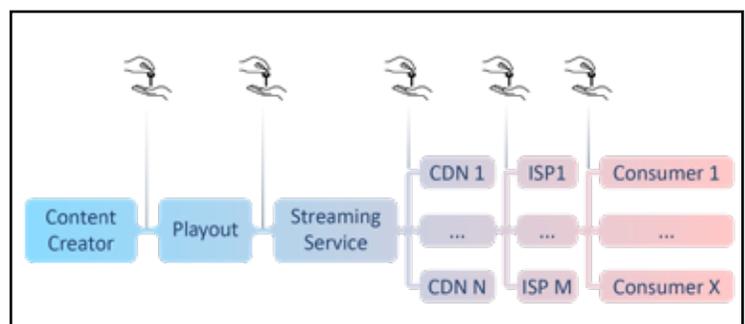


Figure 2: OTT Service Provider Mix

content is to start with high-quality delivery to a target audience, and respond to feedback in real-time. To achieve this, many are looking toward new technologies – most notably, AI.

Enabling Technologies

AI has been talked about for decades, but adoption and useful results have been a rollercoaster ride. It didn't really become a practical reality until the cloud, big data, and IoT enabled the capture, storage and processing of vast quantities of data.

Large datasets can hold a lot of potential value, but it is challenging to find patterns, trends, and anomalies within them. Methods and approaches from computer science, mathematics and statistics have been joined together to extract and interpret knowledge. Approaches vary from Data Warehousing and Online Analytical Processing (OLAP) to Data Mining and Machine Learning (ML).

Data Mining is defined as the process of discovering patterns in data, either automatically or semi-automatically². This process is supported by tools and practical techniques also known as Machine Learning, which are used to identify the underlying structure of the data. Data Mining techniques can be used to predict future outcomes based on historical data – for example, identifying customers unhappy with their OTT service and predicting the likelihood of them cancelling their subscription. Machine learning can support this analysis by, for example, using clustering methods to categorize customers based on their consumption habits.

There are numerous AI methods and approaches that can be used in Data Mining applications, depending on the characteristics of the available data and the questions to be answered. It is critical to pick the right set of tools and techniques. With the help of a

Data Scientist, the project goals can be decomposed into subsequent tasks that can be solved by certain Machine Learning techniques. Selection of the proper model or approach requires investigation of the data, which must first be cleaned, transformed and properly ingested into the system. The path to an optimal Data Mining solution may involve iteratively exploring, building and tuning many models.

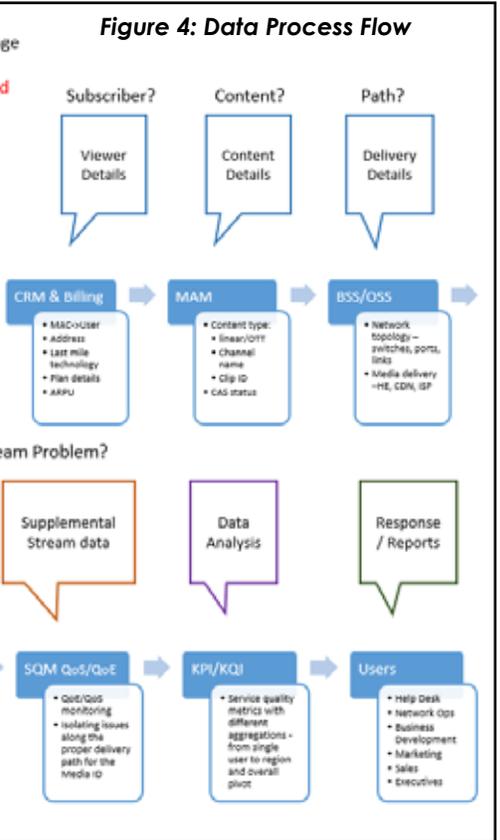
Various off-the-shelf software tools offer graphical and conceptual support for all phases of the knowledge discovery process. This eases the daily work of Data Mining experts and allows a growing number of non-experts to start knowledge discovery projects, but since every use case is unique, you will need to understand how to properly use these components. There are always factors such as exceptions to rules and errors in data that require further analysis of data and fine tuning of the models.

Customer Case Study: Big Data and AI in Action

An example of the use of AI and ML to turn Big Data into actionable business insights is a project that Qligent deployed with a large-scale provider. Their primary objective was understanding, preventing and reversing subscriber churn, but to do so they needed a better understanding of their end-customers' experiences and consumption habits.

The provider deployed an intelligent analytics system that supplemented data collection and mining with controlled "Last Mile" probes and end-user IoT probes. A Big Data architecture was designed to process the new and legacy data in real-time, and a workflow sequence was created to process the data as shown in Figure 4.

Key Performance Indicators (KPIs) and Key Quality Indicators (KQIs), shown in the seventh stage in Figure 4, were developed



to create both predictive and prescriptive analytics. The complex analytical computations behind the KQIs were modeled to indicate service availability.

To simplify the understanding and use of the results, the KPIs and KQIs were broken down into three topological domains – the headend, the network and the subscriber – and designed such that any output metric lower than 95% would trigger corrective action. By leveraging these insights, the provider realized quantifiable improvements in quality and viewer engagement while reducing support calls and churn.

The analytics system currently generates approximately 20,000 predictive tickets each week across all KQIs in all macro-regions. The number of tickets is expected to continuously drop as the provider's first-line and second-line support teams use this information to optimize the performance and reliability of their network.

The headend and network KQIs were initially already above their minimum target of 95%, but increased another 1.4% for the headend and 1.7% for the network over the first six months with the help of analytics-driven corrective actions, and continue to grow. Interestingly, this seemingly modest improvement in quality was followed by an increase in concurrent subscriber usage. The provider was subsequently able to correlate that the service quality improvements attracted more concurrent viewers and longer

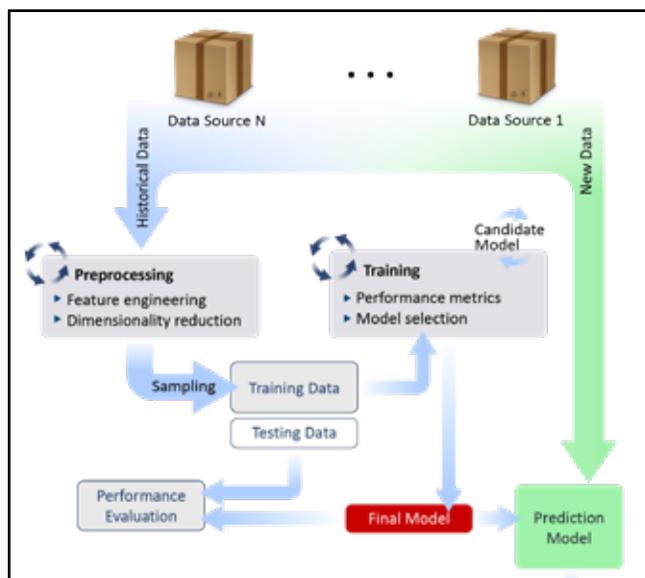


Figure 3: Machine Learning Process Flow

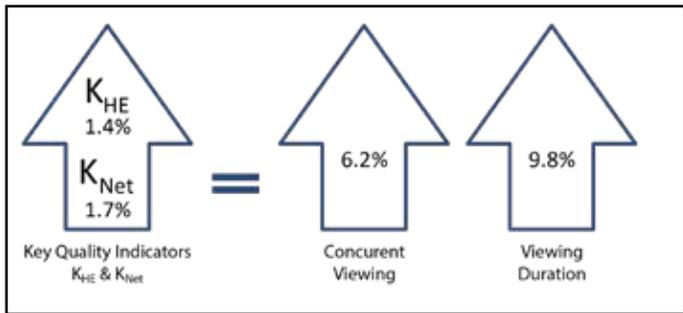


Figure 5: Viewing Impact of Quality Improvements

average viewing times.

Between 150 and 300 subscriber-related predictive tickets are generated by the system daily per macro-region, each representing an individual or small group of subscribers predicted to be affected by a critical fault in the next three to five days. The second-line support team investigates each predictive ticket, with a goal of preventing the fault from happening.

an 86.2% decrease in customers calling multiple times about the same problems. This confirms the benefits of quickly determining the root cause of any issues.

The analytics results also enabled the provider to create a prioritized “churn prevention” list for customer service agents to proactively contact. Initially, the weekly-generated list had a large number of subscribers to call, with roughly 35% of them predicted to have a very high probability of leaving the service. After six months, the list was reduced by over 80%. Furthermore, by arming service representatives with analytics about subscribers’ preferences and past technical problems, the agents were able to demonstrate the provider’s commitment to customer service when speaking with the subscribers. Having this personalized knowledge

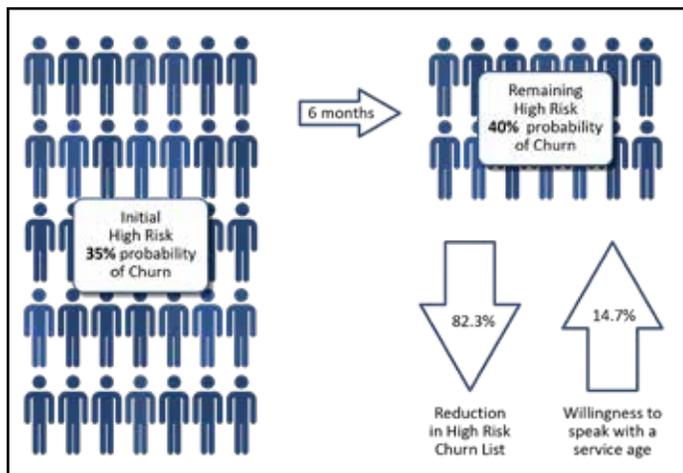


Figure 6: Churn Reduction Impact of Quality Improvements and analytics insights

As a result, the first-line support team saw a 6.6% decrease in the number of incoming customer problem reports. Even more impressive has been an astounding 93.8% decrease in repeat calls from customers about the problems detected and sent for investigation by the analytics system. Similarly, the second-

line support team saw before the call proved far more successful than generic questionnaires or robo-calls.

Conclusion

OTT enables an array of compelling new business models, including personalization at a global scale. It changes everything from the size and type of content, to how content is measured and monetized. This trend also introduced new players into the media and entertainment landscape, many of whom were early pioneers in the use of the cloud, Big Data and AI. Now, the new and traditional players alike are looking toward these technologies to gain a competitive advantage.

Bringing these technologies together can provide media organizations with valuable insights they can use to improve their subscribers’ experience. Most importantly, the use of AI and ML enables providers to predict problems before they actually occur, and thus correct them before they impact their viewers. As seen in our case study example, early project results demonstrated a direct correlation between quality improvement and end-user engagement. More viewers tuned in, watched longer, and were less likely to cancel their service after knowing their provider is staying on top of QoS and QoE issues. The only thing worse than not addressing quality problems quickly enough is not knowing about them at all. □

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Solving the Video Marketplace Connectivity and Payments Challenge

By: Ed Laczynski

Connecting the dots in a crowded video marketplace poses a significant challenge for video content owners trying to push products to the right place for consumption. The OTT market is flooded with set-top and mobile marketplaces where viewers go for on-demand and live content like iTunes, Google Play, Roku, Amazon Fire, and others. Each has its own payment and marketplace management rules, dashboards and APIs. Managing the integration between video products and services across these marketplaces proves to be a big technical and operational challenge.

Enterprises that are building video-centric products and services — especially those that are based on a monthly or annual subscription model — need strategies and tools to conquer the marketplace connectivity challenge. It starts with understanding the marketplace landscape and preparing a monetization strategy accordingly. Content owners must understand what is required and know the marketplace delivery points for their content.

Understand the marketplace landscape to prepare your monetization strategy

Typically, when product managers are launching a new subscription service they rely on a number of marketplaces like

Apple iTunes, Google Play, Roku Channel Store, or Samsung Tizen (among others). These platforms provide reach to millions of potential audience targets with easy-to-use in-app purchasing. While many successful services launch on just one marketplace, to reach the full global audience most services eventually need to deal with this fragmentation.

Each of those marketplaces—and the app stores that consumers use to download and pay—function differently in terms of quality assurance rules, merchandising and authentication rules, as well as how their backend payment system works. However, if not planned and integrated carefully, these marketplaces can obscure valuable customer information, as well as making it a challenge to provide a “buy once, use everywhere” model where your customers can subscribe on Apple iPhone, for example, and watch from home on their desktop computer through your website. Considerations like these are what help knowledgeable product owners make smart decisions regarding marketplace and monetization.

Multiple Marketplace Payment Infrastructure: APIs and tools to solve this challenge



Ed Laczynski is the Co-Founder of Zype Inc. and serves as its Chief Executive Officer and Director. Laczynski has more than 10 years of digital technology leadership experience. As a Senior Vice President at Datapipe, he led the business and product development vision, achieving significant sales and customer growth. A frequent speaker and author, Laczynski is recognized throughout the industry for his thought leadership, vision and experience helping organizations succeed with cloud computing. He is an award-winning entrepreneur and developer.

Speed-to-market is crucial; however, enabling frictionless payments and unifying information across multiple app marketplaces can be complex and time-consuming. While customers have the option of building middleware to integrate into multiple app stores and harmonize customer accounts, entitlements and transactions, to realize fast time-to-market they should strongly consider marketplace-ready infrastructure to enable in a more streamlined way.

To solve this challenge, product owners should consider building or buying software that can serve as a Multiple Marketplace Payment Infrastructure. This is defined as:

- All monetization offerings, price points and associated entitlements can be monitored and managed under a single view — along with business rules for various promotion plans including discounts, coupons and trials. All of this can be accessed via API.
- All integrations with the various marketplaces — including point of sale and backend event handling and receipt validation, should be automated, with implications for entitlements made available as soon as possible to your services. This is so consumers that buy can watch everywhere as soon as possible, and those that cancel cannot.

This type of architecture can provide a turnkey payment infrastructure and leverage



Understanding the marketplace landscape is key to monetization.



How do you turn marketplace connectivity into a payment machine?

simple, unified APIs that provide authentication, entitlements management and customer account synchronization that works across these marketplaces to provide a great experience for customers and your VidOps team.

Give your VidOps team great tools

Another important factor in beating marketplace connectivity challenges is reducing complexity among teams, processes and tools. A single streamlined workflow creates visibility into processes and tools for more effective payment management and will help your team get access to data quicker, make

better decisions, and ultimately work better together.

Overcoming the marketplace connectivity challenge is important for content owners looking to drive engagement through seamless customer experiences while growing revenue. By understanding the marketplace, using an effective monetization strategy, incorporating a payment infrastructure that provides support across marketplaces, and unifying teams, processes and tools into a single workflow, content owners will find success in the growing video marketplace and opportunities to build, establish and engage audiences. □



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Cloud Components as the Future of Streaming Services

By: Olga Kornienko

Content protection equates to security for the revenue stream of each and every video service. That is the simplest way to define the business rationale for DRM protection mechanisms. With that as a simple premise, the actual detailed discussion of security for video services can sometimes seem to be vastly overcomplicated: from considerations of what security is needed and how to implement it, to how DRM technologies work, and how to make sure all your customers can see the content they are authorized to see. To some extent, the technologists in the history of our business have had a tendency to muddy the waters with generations of products that demanded proprietary formats, esoteric interfaces and a propensity to hide key topics behind a veil of secrecy that only served to obscure the key logic and central principles of our industry.

But it doesn't have to be this way. As the video industry is working hard on projects that essentially democratize the creation and delivery of video content, the use of security - vital to the business dimension of every service - is bit by bit starting to feel a little less arcane.

A best practice approach for this new landscape is the focus on products and services rooted in cloud environments. For a number of years, the market has seen monolithic cloud video services—often termed Online Video Publishers (OVPs)—that provided a white label framework for setup and delivery of video with low capital expenditure. But the current trend is towards disaggregated cloud offerings providing “best of breed” functional building blocks. Other essential advances include frameworks for operators to assemble, connect and manage these components to provide a flexible, resilient workflow for service deployment and expansion.

Such cloud-based specialist *microservice* components are now a significant force in the streaming business; and video services built utilizing this approach are setting the standard for efficiency, scalability, and agility in the new video marketplace. There are a number of key characteristics that help propel this trend:

- Exceptional individual component performance characteristics, in terms of



Olga Kornienko is a Co-Founder and COO of EZDRM, the original DRM as a Service Specialist. Since 2001, Olga has driven the growth of this very international enterprise and established its strong market branding as both a business and a technology leader. Olga is an expert on video security, security industry history, and a frequent contributor to industry publications and conferences.

efficiency, latency, throughput, etc.

- High component scalability
- A level of automatic resilience
- Simple to use inputs and outputs
- API-based operational configuration

Take, for example, the recently announced EZDRM API integration with Amazon Web Services (AWS). Specifically, AWS Elemental

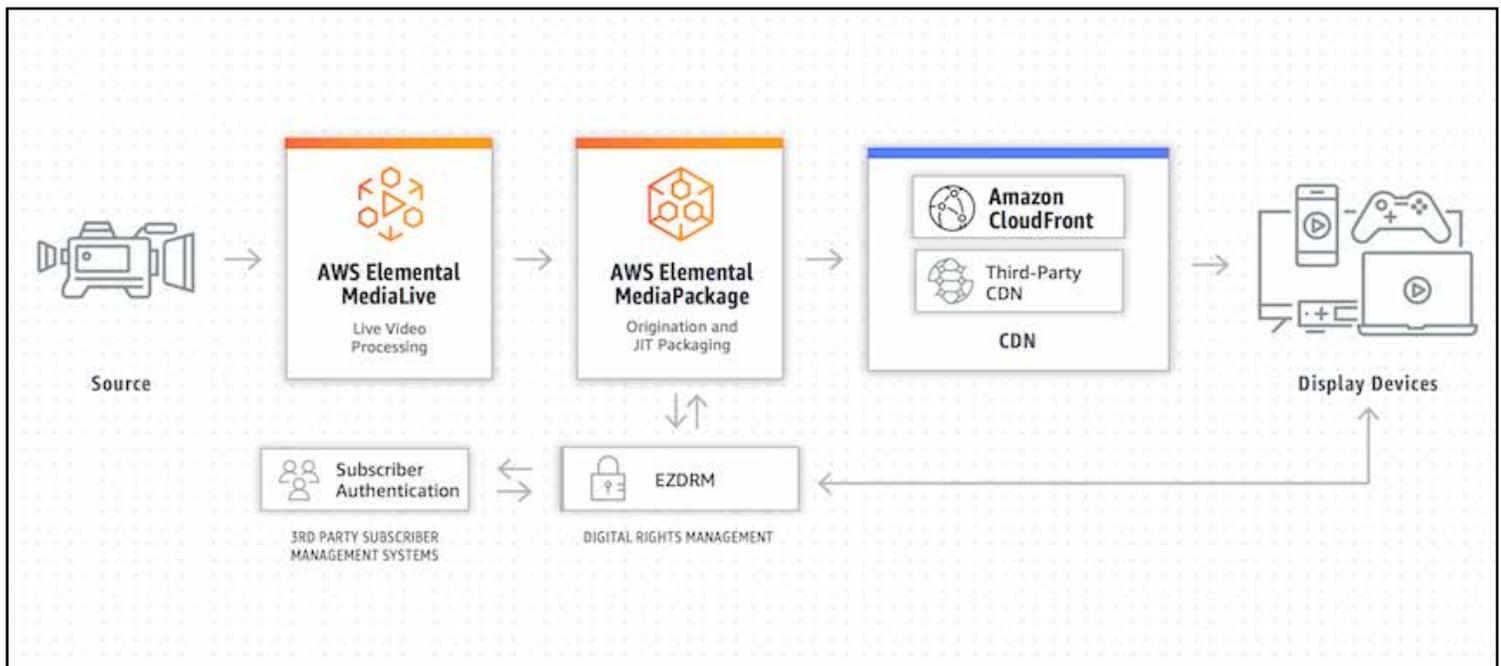


Figure 1: A simple example of the combination of basic components.



DRM complexity should no longer be a barrier to business success.

Media Services are a good illustration of the power of this kind of innovation (a full brief is available on the AWS Elemental website at <https://www.elemental.com/resources/briefs/multi-drm-cloud-based-video-workflow>).

A simple example of the combination of basic components is offered in the diagram (Figure 1). Think of it as Lego blocks for video streaming, if you like. Live video workflows combine real-time encoding using AWS Elemental MediaLive and just-in-time packaging, origination, and encryption using AWS Elemental MediaPackage with a DRM solution to securely process and deliver linear broadcast and event-based content to consumers.

The power of the component-based approach can be seen through:

- Use of AWS Elemental MediaLive real-time video encoding service to provide channel by channel advanced live compression that optimizes quality level at each tier of video bandwidth all the way from mobile resolutions up to premium 4K/UHD/HDR quality.
- AWS Elemental MediaPackage providing just-in-time packaging, stream formatting, manifest generation and encryption for the full range of Adaptive Bit Rate streaming formats required by diverse customer devices.
- The Digital Rights Management (DRM) solution provides complete multi-DRM encryption, including Google Widevine, Microsoft PlayReady and Apple FairPlay Streaming across the range of packaging

formats to secure playback on client devices.

- Effective QoS through last mile delivery service based on Amazon CloudFront and 3rd party CDNs.

The interconnect and management of this architecture is all enabled through AWS Elemental Media Services, which provides customers the capability to ingest, process, package, and deliver video content at scale. When head-end infrastructure of this type is combined with complete client-side SDKs, it is possible to rapidly configure and deploy world class end-to-end video services that are complete, scalable and expandable.

How does all this technical effectiveness relate to improving the economics of service delivery and the simplicity of the business models? We think it can be demonstrated that technical scalability of this type is paralleled by business scalability, with straightforward and simple models to understand and implement. Most importantly, cloud resources have the compelling advantage of a pay-as-you-go model. A few points that underscore this argument:

- The microservice-based approach makes sophisticated technical components available to deploy with very low initial expenditures. Setup fees are typically low, and service-related fees typically scale very well with user load - and therefore potential service income.
- A significant cost driver for video is CDN bandwidth so small optimizations of encoding profiles can pay back very quickly. This

is a continuously developing field, so access to routinely updated software components that track best-in-class performance without extensive system management complexity is a big plus.

- Workloads for video tend to be very dynamic. Channel line-ups vary event-by-event. Ingest to on-demand libraries needs fast response, but on a typically irregular basis. So, it's a big advantage to be able to switch compute power on and off as required.

It seems clear that best of breed, virtualized video service building blocks are lowering the technical and commercial barriers to competitive service deployment as a prime example of cloud best practices. Using a fully managed, hosted cloud-based service avoids serial integration of different DRM technologies and provides a straightforward, future-proof interface between your workflow and secure, reliable service delivery.

With DRMaas, there are no functional compromises involved in the implementation and the business approach enables functional completeness while scaling for the future service capacity. The service business approach is always the top priority, and DRM complexity should no longer be a barrier to business success. □

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2019 OTT Accolades Finalists Announced

By: Brian Mahony

We are excited to announce the 2019 “OTT Accolades” (OTTA) finalists. Each year, we honor the executives and companies that stand above the crowd representing the best of the OTT industry. Winners for each category will be announced live and crystal “OTTA” trophies awarded at OTT Executive Summit, May 29th in New York City (www.OTTExec.com).

We had huge interest in this year’s OTT Accolades awards program (OTTA is pronounced “otter” with a Boston accent). Based on feedback, we also made a few changes. First, we combined the “Product of the Year” and “Company of the Year” categories. There really wasn’t enough differentiation since companies that excel usually have a good product behind them. In the case of a company that is part of a larger conglomerate (e.g. Comcast) we’ll duly note the product or division deserving the kudos. Second, we have separated the announcement of the OTTA finalists, who will now get deserved recognition by being highlighted in the Spring/NAB issue of the magazine every year, from the award winners, who will receive their crystal trophies in person at OTT Executive Summit. Winners will then have their profiles featured in the Summer issue of the magazine.

Full disclosure: some of the companies on this list, including Roku, Amazon, and Netflix, are part of my current stock portfolio, or may be at some point in the near future.

Without further ado here is the list of OTTA Finalists.

2019 OTTA Executive of the Year Finalists

This year’s batch of OTTA executives represent a mix of innovators, survivors, and leaders guiding their companies through re-birth. Perhaps most famous of all is Netflix’s Reed Hastings. Love ‘em or hate ‘em, Reed has guided Netflix from a DVD mail order company into the worldwide streaming giant that it is today. All new services must use the Netflix strategy as a competitive benchmark, including new services from industry behemoths Apple and Disney. Netflix’s billion dollar investments in original content, and cold shoulder to the recent Apple TV+ launch, will shape the OTT landscape for years to come.

Other executives deserve praise for guiding their companies through various types of acquisitions, spin-outs, or re-launches. Take for example Synamedia CEO Yves Padrines and MediaKind CEO Angel Ruiz, who find themselves at the helms of the former video divisions of Cisco and Ericsson, respectively. Unencumbered by the larger conglomerates, they are now focusing like a laser beam on the burgeoning OTT space. Then there are those execs growing their companies through acquisition, namely CEO Jeff Ray of Brightcove (acquired Ooyala) and CEO Scott Puopolo of Telestream (acquired IneoQuest). Building scale and a more complete OTT product offering is a good way to survive the consolidation happening in the industry.

Speaking of consolidation, how about those executives who have lead their



Brian Mahony is the CEO and Principal Analyst of Trender Research. He is also President of the 45,000 member OTT Executive Community—a vibrant and growing network of TV and video professionals engaged through social media, publications, and events. Brian has 25 years experience with consumer-oriented technology products and companies.

companies to stay the course and NOT get acquired? Kaltura CEO Ron Yekutiel and JW Player CEO Dave Otten stand out for surviving and thriving despite competitors around them getting picked off like flies.

Then there are those leaders growing through innovation. Tru Optik CEO Andre Swanston presented at the 2015 OTT Executive Summit when his company was just getting started. Now his viewer analytics company is signing big deals and growing rapidly. Other innovators include Ken Klaer, EVP & President at Comcast Technology Solutions, who is valiantly tackling the challenge of bridging the gap between the worlds of OTT and cable.

Finally, BritBox President Soumya Sriraman earned our praise for leading the charge for this new joint venture by the BBC and ITV. Can she carve out new space in an OTT world dominated by the likes of Reed Hasting’s Netflix?

Executive of the Year Finalists



Reed Hastings
CEO, Netflix



Ken Klaer
EVP, Comcast
Tech. Solutions



Dave Otten
CEO, JW Player



Yves Padrines
CEO, Synamedia



Scott Puopolo
CEO, Telestream



Jeff Ray
CEO, Brightcove



Angel Ruiz
CEO, MediaKind



Soumya Sriraman,
President, BritBox



Andre Swanston
CEO, Tru Optik



Ron Yekutiel
CEO, Kaltura

2019 OTTA Company of the Year Finalists

This year's cast of companies driving the industry forward are some of the leaders behind the infrastructure that makes OTT work. Since "the app" is what increasingly defines the OTT user experience, 24i Media is on this list. Similarly, Vindicia earns its spot for its industry leading subscriber

management solutions—you can't grow your OTT service if you can't keep customers. Similarly, companies such as IBM Watson are finding ways to use big data, analytics, and AI to provide a more customized viewing experience. Others are focused on the central plumbing of video processing video transport, and video quality-- such as

AWS Elemental and Anevia. Still others are providing a "one stop shop" for new OTT services, which is why ViewLift and Zype made our list of finalists. Both companies are excellent choices for a complete platform that includes content management, distribution, monetization, and intelligence.

Company of the Year Finalists



vindicia
www.vindicia.com

anevia
YOUR NEXT GENERATION TV, NOW
www.anevia.com

ViewLift
www.viewlift.com

Zype
www.zype.com

24/i
www.24i.com

IBM Watson
www.ibm.com/watson

aws elemental
www.elemental.com

2019 OTTA Service of the Year Finalists

"OTTA Service of the Year" was the most fun category for us to review. It's amazing how many OTT service options there are now (over 1,000 by some estimates). And the content is awesome, if you can find it. On that point, we named CobbleCord a finalist for their excellent "service selection" portal. Though not really an OTT service offering in its own right, the portal helps consumers choose streaming services based on simple, customized criteria. With that out of your way, you can choose niche offerings

that appeal to a wide variety of interests. FuboTV, initially focused on Spanish-speaking soccer fans, has now expanded into a full vMVPD. If you are looking for a fill lineup of British, Golf, or Christian/Family content, then BritBox, GolfNow, and Pure Flix, respectively, are excellent additions. If you are looking for a more comprehensive service with both free and premium channels, Xumo or the Roku Channel might be exactly what you are looking for. All of these OTT content service offerings impressed us with strategies that exemplify what is possible

with OTT— wide-scale streaming of high quality content to audiences around the world via a multitude of different devices and screens. Our decision on the ultimate winner of this category will come down to a judgement about the quality of the content discovery and viewing experience, breadth of content, and service availability.

I hope you can join us on May 29th in New York City when we will hand out the crystal trophy OTTAs at OTT Executive Summit. □

Service of the Year Finalists



CobbleCord
Manage Your Entertainment. Wisely.
www.cobblecord.com

PURE FLIX
www.pureflix.com

xumo
www.xumo.tv

fubo^{TV}
www.fubo.tv

britbox
www.britbox.com/us

ROKU
www.roku.com/whats-on/
the-roku-channel

GOLFNOW
www.golfnow.com

A Labor of Love: How an OTT D2C Provider is Lifting Millions

By: Katia Loisel

What makes us truly happy? A Harvard Adult Development Study into what makes us happy, conducted over 75 years, revealed that the secret to happiness is love. The research found that it's not the amount of money, fame or success we have, but rather the quality of our relationships that is at the heart of our happiness. Our close relationships buffer us against stress, improve our health and make us feel greater contentment. Great news if you're blissfully coupled up, but what if you're not?

Where is the love?

Finding and maintaining healthy relationships isn't always easy. We've never been more connected and yet we're lonelier than ever; and it's impacting our physical, emotional and psychological health in a big way. As face-to-face connections are rapidly replaced with digital ones, it begs the question: *What are we losing and what can we gain by reconnecting to one another?* At Love Destination, we believe that love is at the heart of everything and are passionate about leveraging the power of OTT for good. To help alleviate loneliness and inspire and empower people to reconnect and create more fulfilling relationships with themselves and others. Spreading much needed love (and perhaps even happiness) into the world.

Our background in the relationship space provided invaluable insight into how we connect and the impact that love (or lack of it) has on our lives and behaviour. When you're looking for love or having issues in your relationship, finding a solution becomes of utmost importance. However, for many, one-on-one coaching is simply too expensive, and content found online isn't always from trustworthy sources, compounding the problem. This insight helped shape the very core of who we are and what we do. We wanted to make expert content accessible, delivering content that empowers, educates and entertains.

The Love Destination, which combines eLearning with digital TV, launched its SVOD and AVOD streaming video network for everything love, dating and relationships in late February. It is available on a growing range of devices and will soon launch on

over ten million connected TVs worldwide. With a catalogue at launch of more than 1,000 titles, including 50 expert-guided courses, we're thrilled to deliver a wide variety of expert-guided courses, how-to's, lifestyle shows, documentaries, films and expert resources that will stimulate your mind, touch your heart and help you transform your relationship with yourself and others. Our viewers can enjoy our on-demand programming, and access experts at their fingertips—anytime, anywhere. We offer selected ad-supported content for free, while premium service provides access to the entire library across all Love Destination supported-devices.

Our relationships: Helping us spread love to millions

Our relationships have always been a key component of our customer acquisition and brand awareness strategy and are at the heart of our success to date. As a startup, we needed to find ways to license content and reach our target audience cost effectively while mitigating risk. One of the key questions we asked ourselves was "How do we reach millions without a multi-million dollar budget?" The answer was partnerships.



Katia Loisel, Founder and CEO of The Love Destination, is a relationship and body language expert with over 19 years experience in content production and media, developing and producing dating, relationship and lifestyle content for the global market. She has worked with thousands of singles and is passionate about helping people to connect and spreading love worldwide.

From day one, we knew that we didn't want to build from the ground up; we wanted a tech partner that could do more than just develop our framework and apps. We needed a partner that had perfected the recipe and was willing to share the secret ingredients.

Our partnership with OTTera provided just that, as they had over 10 years of fruitful partnerships with connected TV and set-top box manufacturers worldwide. This relationship accelerated our road to market, allowing us to leverage their partnerships with the world's largest consumer electronics manufacturers, including Hisense and Vizio TV. Working with OTTera took the headache



The Love Destination: spreading love to millions of viewers via OTT.



Finding love and expert advice...at our fingertips.

out of building out our tech and finding the right distribution channels, freeing us to focus on successfully growing our community to over 70,000 viewers today. Utilising OTTera's highly adaptive framework, our apps have been launched on a growing range of digital platforms including browsers, iOS, Apple TV, Android, Google Play and Roku set-top-boxes, and will soon launch on over 10 million connected TVs and devices through our partnerships with Hisense, Sharp, Toshiba, and Vizio TV – with more to come. These partnerships would have taken us years to secure on our own.

Driving brand awareness by working with experts, influencers and brands who share our audience is also an important part of our strategy, allowing us to reach those who are

actively looking for expert advice on finding love or navigating their relationships.

Curating a catalogue that empowers, educates and entertains

As anyone in the OTT space will know, a robust go-to-market strategy is nothing without the right content. However, curating a large catalogue of content is no mean feat, particularly when you're serving a niche. This has been one of our biggest challenges to date. We made the decision early on to focus our internal production efforts on content that we couldn't easily acquire. We then leveraged our 400-strong stable of experts for what we were already good at; creating a cost-effective catalogue of exclusive original expert-guided content, documentaries and

shows on everything love.

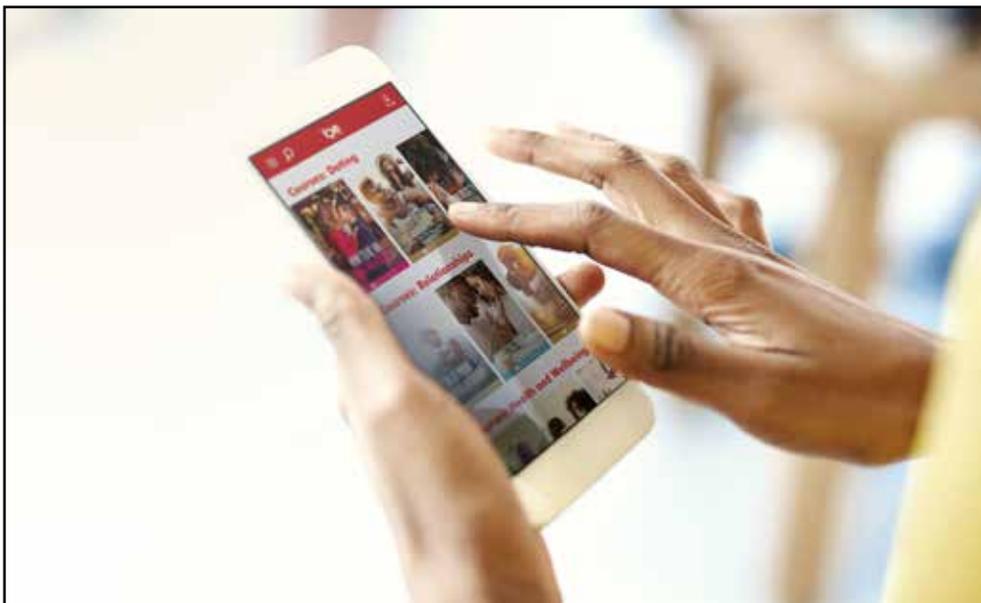
Our viewers can now access experts at their fingertips, on demand, 24/7, for a fraction of the price they'd normally pay for expert courses or advice. We've built up our expert programming to include courses on dating, relationships and wellbeing. These courses are tailored to help you heal your heart, date with confidence, master body language, manage conflict, navigate relationship issues, reignite the spark with your partner, and help you to reconnect with yourself, offering powerful steps to self-love, confidence, and health and wellbeing. We stand out from our competitors by offering original tailored expert-led online courses designed to help our subscribers solve a problem at any stage of their relationships, super-serving our subscribers and providing unbeatable value.

However, producing content was only part of the content puzzle. We also needed to license content. But as a startup, we needed to avoid paying large upfront licensing fees, and where possible, use a revenue-share or cost-per-view licensing model. We learned that there were a limited the number of distributors we could work with, particularly pre-launch.

In 2018, we partnered with Oovvuu, an Australian video scaleup using proprietary artificial intelligence (AI), which allowed us to license short and long-form content from a catalogue of over 50,000 titles. Oovvuu partnered with Love Destination in order to continue to fulfil its mission of delivery high quality content from the world's best broadcasters to the ever growing worldwide audience seeking brand safe content from quality trusted journalists. Since launching in 2014, Oovvuu has partnered with 100 global broadcasters and publishers including The BBC, Reuters, Bloomberg, Agence France Presse, Associated Press and Australia's Seven West Media.

This partnership allows us to curate a constantly growing catalogue of brand-safe inspirational stories, films and documentaries on social issues, relationships, kindness, health, and human connection, that stimulate your mind and touch your heart.

While we have come a long way, the challenges of building and scaling an OTT direct-to-consumer (D2C) business continue. However, through it all, we have our sights and hearts firmly set on growing our catalogue, building our community and spreading the love worldwide. □



Love and relationship content and advice on the go.

The Future of OTT: Marrying Artificial Intelligence with Video Processing

Interview by Brian Mahony with Guido Meardi, CEO and Co-founder, V-Nova

Guido Meardi, CEO and co-founder of V-Nova shared his insights about the future of OTT with Trender Research's founder, Brian Mahony.

Brian: Tell us a little bit about yourself?

Guido: As CEO and co-founder of V-Nova, I am passionate about making the future of digital and AI come alive, empowering everyone to access high quality digital experiences whenever they want, wherever they are.

Before setting up V-Nova in London I was a senior partner at McKinsey, as well as an avid angel investor in tech. I'm a happy hybrid of business, technical and entrepreneurial backgrounds. Throughout my career, I've maintained a deep interest in computer technology and artificial intelligence, and believe that breakthroughs in compression, data quality and processing speed will be transformative for many industries and consumers.

Brian: Can you give us an overview of what V-Nova does?

Guido: V-Nova stands for applying AI and parallel processing to data compression. By

redesigning the foundations of encoding from the ground up, we ultimately achieved better data compression and substantial processing power reductions without requiring dedicated hardware acceleration, hence maintaining compatibility with the devices we all already use.

We were the first company to commercialize and deploy an AI-based codec. We offer the most efficient video and image codecs in the world and we assembled a unique patent portfolio of over 300 international patents. Our umbrella family of formats (PERSEUS) already stemmed two distinct software-based codec formats: PERSEUS Pro, for mathematically lossless and visually lossless professional production and contribution applications; and PERSEUS Plus, for high compression efficiency in content distribution to end users, web publishing and peer-to-peer applications. We are also involved in multiple standardization efforts in SMPTE and MPEG.

Our products enable operators to improve customer experience, serve more users, reduce equipment CAPEX/OPEX, reduce bandwidth/storage requirements, and speed up semantical indexing, whilst maintaining compatibility with existing devices, standards and workflows.



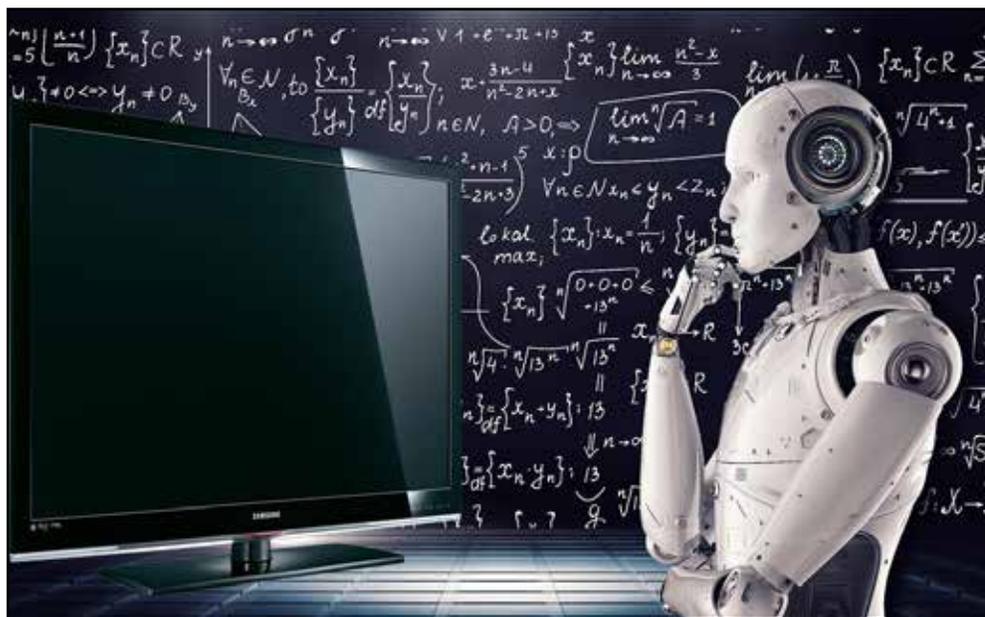
Guido Meardi is CEO and Co-Founder of V-Nova, and a former senior partner at McKinsey. Guido has extensive business experience as well as technical depth. He directly contributed to the technology development of V-Nova's PERSEUS, a unique family of compression formats that provide a step-change in the quality, reliability and cost-efficiency of video services, with over 200 patents co-authored and filed.

Brian: What new products are you excited about and how will it help/change the way people view OTT content?

Guido: PERSEUS Plus is continuously gaining more ecosystem partners and deployment options, most recently with Telestream adding support. This is helping more services to upgrade their video delivery to PERSEUS and we recently deployed the first payTV OTT service able to provide premium full HD live sports to large TV screens at bandwidths as low as 2.5 Mbps. We also showcased the first OTT mobile apps able to distribute live 1080p channels at bandwidths as low as 1 Mbps, and the first satellite UHDp50 live channels at bandwidths lower than 10 Mbps. This all boils down to enabling more people to view better quality video, however constrained their internet connections are.

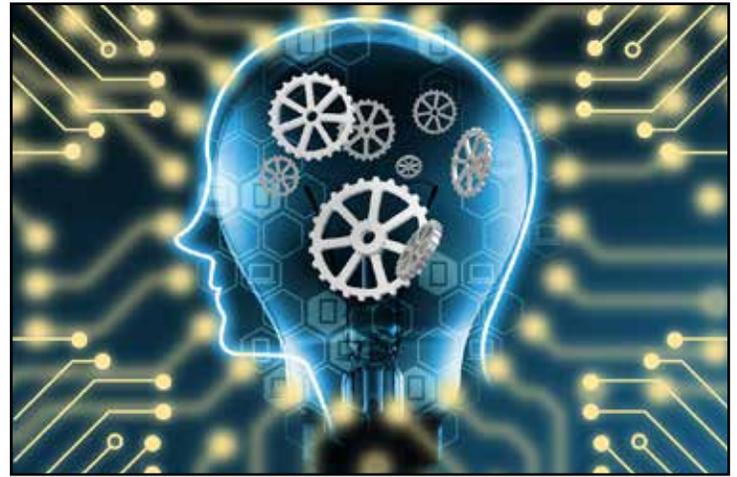
I'm also proud that V-Nova was the first company to commercially deploy a video codec that included AI at its core. PERSEUS Pro with Deep Learning was recently implemented on our live contribution encoder/decoder product and in non-linear editing plugins. PERSEUS Pro realises vast savings in equipment CAPEX/OPEX, bandwidth and storage requirements, which is great to accelerate the feasibility and therefore growth of UHD HDR OTT services, and more efficiently produce and distribute tier-2 sports and eSports content.

This development is part of the wider opportunities which the introduction of AI and machine learning offers to media companies at almost every level of production





Increased live streaming has led to QoS issues.



AI will help operators to better understand their audiences.

and distribution. Most specifically, AI and ML will help operators to better understand their audiences by leveraging the data they already have at their disposal from network glitches to consumption patterns and search behaviour, and to use that to optimise and personalise the experiences they provide to their viewers. We're playing a key role in driving forward those personalised services by leveraging PERSEUS Pro to significantly accelerate AI semantical indexing of content.

Brian: What role do standards play with regard to video encoders and decoders?

Guido: They play a critical role in listening to the industry and helping to bring together key technologies in a way that can be rolled out across very complicated workflows and ecosystems. Through our work with bodies like SMPTE and MPEG we also see how these organisations can be an amazing hotbed of talent and innovation.

In particular, we are seeing rapidly growing interest in enhancing compression efficiency, and doing so without necessarily requiring new hardware is something the industry and our customers find compelling. By bringing together leading vendors across the industry and focusing minds on solving real issues, a lot of progress is being made in this area that will bring major benefits.

In parallel to standards, which are essential to fragmented open ecosystems and relatively small operators, it must also be said that more and more ecosystems are migrating towards software on top of general purpose hardware and OS/middleware stacks. For large operators, industrial use cases and secured apps this means controlled end-to-end workflows where operators are free to use any technology they feel like using, including proprietary components. This trend, already established for audio codecs, has the potential to foster faster cycles of

innovation and more competition, which ultimately will benefit the end consumer. The era of "one size fits all" and "there can be only one" is over for video codecs, and we are happy to be one of the companies heralding this new era of quality and choice.

Brian: What obstacles must be overcome before we have full consumer adoption of UHD TV?

Guido: Adoption of UHD TVs themselves is absolutely happening and at a great rate as it becomes the default for CE manufacturers and retailers. You only have to look at the recent announcements from the Consumer Electronics Show in Las Vegas where 4K displays have become almost secondary to new flagship 8K TVs. That there is next to nothing in native 8K to watch on them, unless you live in Japan, is beside the point. The industry is headed in this direction.

The bigger challenge, of course, is how to deploy UHD content services that can operate at scale and deliver a good quality of service. This involves a lot of components across the delivery chain, but fundamentally the volume of data required and the costs of encoding it are core to the challenge. Reducing bandwidth requirements improves QoS and reduces delivery costs for operators – therefore making more services feasible from a business standpoint.

Brian: What do you feel is the biggest challenge in the OTT market today?

Guido: The main challenge remains delivering a QoS that matches traditional TV distribution whilst the demand for OTT consumption continues to grow apace.

The tremendous growth in live video delivered via OTT—dramatically more challenging than VoD for encoders and CDNs—continued apace in 2018. However,

the gap between demand and network capacity meant that we saw another slew of quality-of-service issues and unserved demand across the globe. I fully expect this trend to continue throughout 2019, driving increased interest in solutions to the problem of large-scale TV-like (and better-than-TV) live streaming such as V-Nova's own PERSEUS Plus.

Driven in particular by sports and eSports, content rights owners and operators will increasingly distribute premium content over the internet in 1080p60, 1080p60 High Dynamic Range (HDR) and UHD HDR. This will impact the whole delivery chain. Production workflows will require upgrades to support UHD HDR, while higher volumes of content will require different solutions, including remote production and unmanaged networks contribution. Solutions that reduce capital outlay and transmission costs to a fraction, including our PERSEUS Pro and PERSEUS Plus solutions, will become a must.

I also expect compression advances to contribute to making live cloud-based workflows as cost efficient as on-premise ones, further fuelling the explosion of services and channels. Content owners of any size will be able to go direct to consumers, with no need to "build" infrastructure. This trend will continue to drive industry consolidation in 2019, as well as to question the long-term validity of some existing business models in the value chain for both vendors and operators. □



OTT: The Most Misunderstood Acronym in Digital Media

By: Jon Sumber

In a digital advertising/marketing world filled with DSPs, SSPs and PMPs that accept IOs based on CPM, CPC and CPV to meet KPIs defined by CTRs, VCRs and CPAs, it's somewhat remarkable that OTT – an acronym with which most media professionals are relatively familiar – is still so *misunderstood*.

Let's take a shot at a working definition: OTT is broadly defined as the transmission of video over a broadband Internet data connection ("over the top" of the data pipe) onto a video playback device without requiring a subscription to a "traditional" cable or satellite pay-TV provider. The video is often (but not always) accessed via an app.

To be sure, there are a ton of streaming options (ad-supported, ad-free, hybrid) all battling it out for adoption. After all, consumer choice is the accepted wisdom of the digital economy, and such wisdom holds sacred the philosophy that supply and demand will inevitably sort the wheat from the chaff.

But how should advertisers look at OTT while the space sorts itself out? Surely not all video being streamed is created equal. But does that even matter? OTT is an audience-based television product, so who cares if my ideal customer is watching *This is Us* or funny cat videos? All the same, no?

No. Not all OTT video is alike, so to speak.

First, what do we mean by "video"?

Should a marketer pay the same price to serve an ad on cat videos as they do on *This is Us*? Fortunately, the lexicon has evolved such that we now have the more appropriate term "long-form video." Progress...

But wait, how does one guarantee that ads are serving within long-form and higher-quality video when it's a well-known limitation of OTT advertising that I can't target or report at the program level?

Meet the *full episode player*, or, as it has become known, "FEP"...because, acronyms... *amiright?* OTT salespeople barrage advertisers promising "100% FEP!"

Well... not exactly.

An FEP is designed to *handle* long-form content (think 30- to 60-minute TV programs); it does not *define* the content.

It's a valuable product requirement for OTT, but in the end, it's still just a video player. In other words, "100% FEP" may be another cat video.

FEP content does not follow any specific rules of length or quality, and the "transparency" offered by most OTT campaigns is limited to an app level view or, at best, a channel.

And a marketer is asked to pay a premium CPM for this inventory?

Yes.

Well, all right. Guess we're done here. OTT is a cluttered, unregulated, messy space that isn't safe for advertising.

Messy and cluttered, yes, but OTT ad revenue exceeded \$2 billion last year—not bad for a misunderstood acronym.

We hear consistently that advertisers want to reach the right person at the right time within premium content. Here are two rules every one of those advertisers should consider:

1. Be sure to separate online video (OLV) from over-the-top (OTT);
2. Partner with those who have proximity to the premium content itself.



Jonathan D. Sumber is the Vice President of digital sales at Hearst. Before joining Hearst, Sumber was manager of digital accounts and business development at Media Networks, Inc. (MNI), a division of Time Inc. Previously,

he was the digital product supervisor for the newspaper division of Gannett in White Plains, N.Y., developing, selling, and executing digital media plans, as well as Gannett digital partners, such as Cars.com, to produce customized, targeted campaigns.

It is common for OTT resellers and demand side platforms (DSPs) to include web-based online video within OTT offerings because (a) anything longer than a handful of minutes in duration can be argued as "long-form," and (b) the market-rate \$15 CPM charged for OLV does wonders in diluting the \$35-45 CPM market rate of quality OTT inventory, making the product appear more competitive. If your reports include web domains for inventory and clicks as a performance metric, *beware*. Instead, get a raw report from your partner and visit the apps/sites/channels where your ad served. Significant waste in your spend can be uncovered.

Bundling OLV and OTT can be an



Should a marketer pay the same price to serve an ad on *This is Us* as they do for cat videos? © NBC.com

effective strategy, especially when a holistic video campaign utilizes the same device graph and data management platform (DMP) to deliver sequential messaging and enhance frequency. However, your partners should be transparent about your inventory. Want a \$25 CPM? Fine; be aware it might entail a 40/60 OLV/OTT inventory split.

Rule #2 applies for marketers seeking association with premium inventory because most OTT resellers utilize a DSP, which means they don't have a close relationship to the content owner.

Consider the process by which an impression becomes available for purchase:

A major publisher produces a TV show and associated streaming apps. The publisher's sales staff sells around 30% of the inventory to the biggest agencies. For the remaining 70% the publisher cuts big deals with buyers who can commit to a minimum spend against audience targets and cuts similar deals with platforms carrying the publisher's app. These major players

have developed business relationships with the content owner, who will often transact utilizing the same ad server to ensure data integrity for targeting and fulfillment.

Once these preferred partners have sold what they can, the remaining unmonetized inventory is typically made available within a handful of OTT-focused DSPs. The catch: Some publishers' rules limit a DSP's access to inventory. One premium publisher with whom we work only allows DSPs to compete for 50% of ad breaks, and one commercial within those pods. In practical terms, this means the DSP might begin with access to just 10-13% of available quality inventory.

From there, campaign parameters such as geo- and audience targeting eliminate substantial relevant inventory. Then factor in frequency caps and pod-collision rules, and suddenly the bottom of the funnel is left with little to no premium inventory. Further complicating matters, volatility and competition will drive up pricing for remaining quality inventory; those without

priority access to premium publishers may find themselves selling at high CPMs or mixing inventory types to remain competitive. In other words, OTT inventory resellers with a heavy publisher component offer a sensible means of complying with Rule 2.

Ultimately, the publisher controls the inventory, the data, and the access to advanced insights. The seller's *proximity* to the publisher allows the seller to maximize access to premium content, heightened transparency and more reliable targeting.

OTT is burgeoning thanks to a wealth of quality and opportunity. But a good deal of snake oil is sprinkled in. It can be a less challenging and more worthwhile space for advertisers who follow the two rules. □

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A Call for More User Control Over the Streaming UX

By: Virginia Juliano

Will Streaming Heed the Lessons that Cable Didn't?

We all know that streaming has come a long way over the last 20 years and OTT video usage continues to increase. However, there are some glaring consumer pain points that should be addressed sooner rather than later. If not, percolating dissatisfaction could bubble up and undermine the considerable 'user good-will' that streaming services have generally been afforded. It's time for streaming services to start giving consumers more control over their user experience before it comes back to haunt them.

Consider what's happening to the Traditional TV Providers that didn't heed the call for more consumer-centric approach, until it was too late – and obviously, pushed people into the awaiting arms of OTT. Clearly, the user interfaces and smart use of data on the part of the online streaming giants is far superior to that of the Traditional Pay-TV world. But the increasingly frequent lament we all hear is that users (or viewers) spend more time searching for something to watch than actually watching. And the new OTT launches from Apple, Disney, WarnerMedia, NBC, etc. on the horizon promise to amplify the problem.

If you don't believe me, just take a look at the results of a recent PwC survey that showed almost 90% of consumers are dissatisfied with content discovery and recommendations. That certainly doesn't sound like a ringing endorsement for the multitude of content recommendation AIs many streaming services have put so much

stock in.

Now that streaming has become fully mainstream and the embarrassment of content riches continues to explode, giving users the option to take (at least some of) the reins seems like a logical next step in the industry's evolution.

Lean Back or Look Forward?

During the early development of video streaming app ecosystem, most of the players decided that the overarching UX approach should give users some straightforward controls (like add to watchlist, basic search and very simple filtering), but largely reinforced the "lean back" nature of video viewing, particularly with apps created for the TV screen.

The assumption was that viewers would want to be served up content while they sit back and passively receive it, essentially recreating the traditional TV viewing experience. Netflix has practically spun its programming recommendations and auto-play features into a veritable product-design art form. Of course, they've done quite well with that approach to date.

But the streaming landscape has changed dramatically over the last few years, and the new flood of content choices has made the lean-back model a source of increasing frustration rather than assistance. The endless rows of scrolling content artwork, the seemingly arbitrary arrays of content categories and obscure micro-genres, the limited and confining search and filtering functions, and the infernal auto-play trailers (my personal pet peeve) are really starting to grate on the nerves of streamers.

And of course, the more people stream, the more of an annoyance it becomes. This sad state of affairs is especially irritating to the self-determined millennial generation, who value freedom, control, flexibility and ultra-customization



Virginia Juliano is the Founder & CEO of CobbleCord (www.CobbleCord.com), a disruptive startup that helps people cobble together personalized bundles of both free and paid streaming services. Its patented process uses customer content, device, internet and price preferences to craft a custom list of services for each user, empowering them to find the best streaming solution to fit their needs and get the most from streaming.

above all else.

Borrowing from the Past to Shape the Future

In a perfect world, relevant content would be easily discovered and displayed to the right person at the right time across the countless walled-gardens of apps. That's surely a goal to work toward, but there are various corporate conflicts and technical hurdles that have slowed its progress (which is another story for another day).

In the meantime, I'm suggesting to simply give users more control within each individual app or service as an incremental way to improve streaming's overall experience. Addressing the 'content fatigue' issue quickly is key to keeping OTT's momentum going.

I believe that this is a product-design challenge more than a technology one. We need a shift within the very product-driven culture of Streaming Tech to a more user-empowered approach – specifically when it comes to the content selection and curation process.

Many long-standing online companies have been perfecting the use of interactive customization and filtering tools for decades. In fact, they are some of the basic tenets of the internet and e-commerce. The streaming world could easily borrow from some of the tried and true, "lean-forward" techniques of these businesses, such as online retail, publishing and travel. Granted, translating these concepts to the TV screen using the clunky remote control as a navigation device surely doesn't lend itself to ease of use. But



it's not an insurmountable hurdle.

Imagine if you could harness the multiple-criteria filtering capabilities of Zappos, the self-curation controls of Flipboard and the sorting capabilities of Expedia to help you determine exactly what you'd like to watch on an average Saturday night. Here are a few ways to start the ball rolling toward more user-empowered Streaming UX.

• **Customizable Home Screen Displays** - The ability for a user to organize and personalize the home screen of an app/streaming service to their taste. For instance:

Want to always see New Releases in the top row? And Nature Documentaries below that because that happens to be your thing? And so on...
— Users should be able to arrange the content rows that are displayed and at what levels.

Don't want to see the Recommended Rom-Com row, just because you watched that one Hugh Grant movie six months ago?
— Let users easily remove certain categories or micro-genres from the display to create a more focused, less cluttered screen.

• **Ramp Up the Filters & Sorting Capabilities** – Think about how much time could be saved if you were able to punch in multiple criteria to surface exactly what you were in the mood to watch. Then sort the results by various components. And those controls were front and center (or at least easy to find). For instance:

Want to see Comedies made in the 90's? And drill down to those starring

Sandra Bullock. Then sort by director?
—Those options should be a few clicks away.

Some services have attempted to address this with predictive or related search functionality, which I've found to be middling at best, and way off-base, at worst. Amazon borrows from their e-commerce roots to allow for multi-layer filtering of video on their desktop and mobile experiences, but they haven't carried it over to their TV app.



• **Features Checklists** - Giving people the ability to turn certain features on or off within an app should be as easy as subscribing or unsubscribing to an e-newsletter. For instance:

Want to disable auto-play trailers (or at least have the option to mute their volume), stop next episode auto-plays completely, turn on credits-skipping and closed captions for all titles in one fell swoop?
— Imagine if each streaming service had an easy-to-use personalization screen or module that allowed you to check or uncheck a few boxes to enable or disable these options, just like you would with parental controls.

Some services do allow for a degree of feature control on an asset basis. For example, on Netflix you can skip credits and

intros while you're bingeing an individual show. Others have enabled very lightweight customization buried deep within the user profile sections on their websites or mobile apps. But so much more could be done.

Emerging platform aggregators (like Apple and Roku) may have plans to enable some feature control on a platform level, which could be helpful. However, most subscribers watch streaming services across multiple platforms and devices, so giving users more control on a service level is a better solution.

Of course, a major counter-argument to user-empowered streaming UX is that streaming services need to promote and curate their best titles. They've invested millions (even billions) into original titles and high-stakes libraries to drive awareness, trial, retention and increasingly important brand equity. I totally get it and I believe that they absolutely should (and must) highlight their best wares.

But the right to showcase top content and the option of user personalization are not necessarily mutually exclusive. There is enough screen real estate to go around, if smartly engineered and cleverly carved up. I'm sure that there are ways to solve it, given all the smart technical, product and creative talent there is in the industry.

And let's not forget that this type of customer-centric thinking will actually help the streaming services in the long run. Personalization contributes to customer stickiness and higher retention rates, which will become increasingly important as new high-profile players enter the space and the streaming wars begin in earnest.

Nothing But Choice

OTT is on its way to becoming the dominant way of watching video, and the last thing we need is to stall or jeopardize its progress by not helping users get a handle on, what is essentially, too much of a good thing – content.

At core, OTT streaming is about customer choice and empowerment. It's about options and personalization. It's about transparency and control. What it's definitely NOT about is expecting newly liberated consumers to go back to the type of one-way relationship that Traditional Pay TV Providers forced on them for many years, when there were no other choices.

Now, for better or worse, there is nothing but choice (I, for one, think it's for better). Services that focus on giving users the tools to navigate this newfound choice will be the ones that have an advantage that will translate into streamers' hearts and minds. And most importantly, into happy, loyal subscribers. □



Cobblecord provides a content selection platform to help frustrated viewers.



OTT End Game: Allow Major Players to Dominate, or Change the Rules?

By: David Price

To say the TV and Media business is in transition is an understatement, but to say that it is in turmoil is equally an overstatement. Everywhere we read about the record-breaking losses in pay TV subscribers. We hear a constant stream of news about industry consolidation such as Synamedia arising from the remains of Cisco’s video business (with Technicolor picking over what was left of their set top box business) and Arris being bought by Commscope. We have seen private equity getting in with their investments in Imagine (formerly Harris Broadcast) and MediaKind (formerly Ericsson TV & Media, formerly Tandberg Television), for example. The way we view video entertainment is changing with Twitter and Facebook now starting to become a significant place where people source their streams. Even the free-to-air sector is transforming itself, such as in the USA with ATSC 3.0. Nearly all the changes have their roots in the ubiquity of the internet. This is now bringing the power of Artificial Intelligence/Machine Learning (AI/ML) into the mix.

In the encoding process, AI is being used to only consume bandwidth that is necessary to avoid artifacts and errors that the human visual system can perceive. In the delivery process, AI is being used to predict rather than just react to consumption patterns. In



the user experience, AI is being used to make far more accurate recommendations. The use of Cloud computing is taking the load of creating a compelling user experience away from the home, allowing far cheaper CPE and generating the agility and flexibility to constantly refresh and improve the user experience. Finally, we are seeing, at last, the “any” finish line; i.e. any content, any time, on any device, anywhere.

A recent report showed that the number of connected devices capable of displaying video has doubled in the last decade. Industry icons have said publicly that “Hollywood is Dead” and Netflix has become a powerhouse of content production. Fighting back, the studios have seized the mantra of D2C (Direct to Consumer). Libraries that have been gathering dust for decades are now starting to become available for consumption by end subscribers. A recent survey by JP Morgan predicts that Disney’s new D2C service will garner more than 160m subscribers and thus become a real threat to Netflix, who today has a mere 139m subscribers. However, privately many question the length of time it will take to get past the 100m mark. Using AI and Cloud, viewers will be able to search for and find the content they want easily using voice that seems to be accelerating in power on an almost annual basis. AI will be the next primary mover, after IP, in the transformation of the video entertainment industry

So, what will the end game look like? Well one thing is for certain—bigger beats smaller and content will always be King (or at least a face card). The bigger studios will continue to swallow the smaller ones and D2C will become ubiquitous. At the same time, the major ISPs will continue to grow and will add content rights through acquisition and/or in-house productions. These larger content owners will also accumulate, mostly by acquisition, the mission critical technology elements for the protection and primary distribution of their content. But, absent net neutrality, the power will still lie with the connectivity providers for the secondary distribution to the display device. So, you have to divide the world into those regions where net neutrality is mandatory and those places where it is either not mandated or not



David Price has driven transformational activities providing advanced technology in the TV and Media industry since the transition to digital technology. He has driven aggressive top and bottom line growth as an executive in a number of leading communications technology companies around the world. Currently he holds a number of Board and advisory positions in the TV and Media technology industry and is Principal at Scala Advisors LLC.

enforced. Where net neutrality prevails, you will see D2C become predominant. Content there will be King for sure and ownership of sports rights will only add to that “King’s” power. Where net neutrality has been abandoned the role of the connectivity provider will become King, especially where the provider also owns rights. Interestingly, cable operators will remain the best way to provide IP connectivity to the user, even with the emergence of 5G, which will take longer to become ubiquitous due to the cost and infrastructure density needed, especially outside high-density populations. So far, cable operators have avoided being labeled as a utility (which, in their primary roles as ISPs, surely they truly are). Will administrations emerge that are strong enough to categorize ISPs as utilities, powerful enough to enforce net neutrality and brave enough to forcibly split companies that own rights and connectivity? Judging by current conditions we would be wise to not hold out breath. □





How Publishers Can Capitalize on AI This Year

By: David Mowrey

In 2018, social media channels limited the amount of news content distributed on their platforms; and a few months ago allegations against Facebook were made for inflating video ad metrics to lure publishers into sharing content on their sites. In spite of these unfulfilled promises that made it tough for publishers to turn a profit, the new year presents them with an opportunity to get back to basics, and focus on how to make the most of incoming traffic on their own sites. To capitalize on this opportunity, publishers can turn to artificial intelligence (AI) to identify and organize complex video metadata in order to better understand everything from visual, audible, and textual data to emotional tones and geographic locations within their video content. With a deeper understanding of video data, publishers can leverage viewer history and behaviors to recommend the right content at exactly the right time. Here's how publishers can use AI to captivate audiences and better monetize their content.

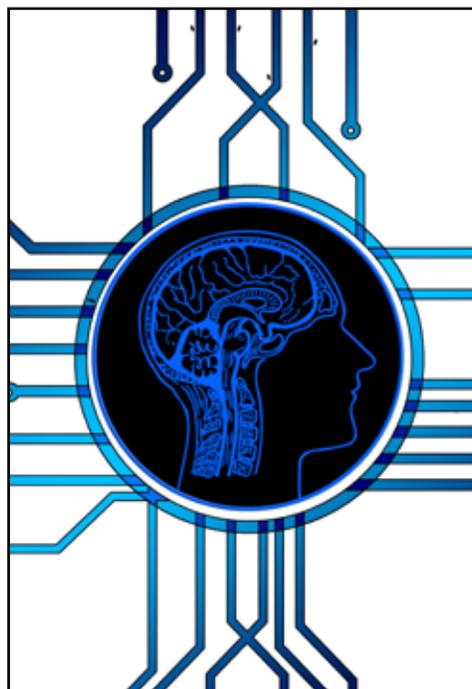
Getting it Right the First Time

Within a crowded industry, publishers are constantly looking for ways to break through the noise and get eyeballs on their content. Take breaking news for example: publishers have an opportunity to captivate audiences with relevant and engaging video. The challenge, however is acting fast in order to make sure the most relevant content is available and ready to accompany written content. That's where AI comes into play. With enriched metadata, editors can quickly search for video content by topic, and then easily determine which videos will best complement a news article. For example, suppose a news organization publishes breaking news about US- China trade relations. AI can help determine whether editors should include a video of the White House Press Secretary briefing or one of political pundits explaining future implications of the relationship, reducing the time it takes to get important news coverage out to the public. With so much of today's news coming in the form of push notifications, delivered straight to individual users, timing is even more important. To ensure audience attention, retention and loyalty, publishers

can leverage AI to recommend the most appropriate supplemental video content based on the news and audience.

...And Also the Second, Third and Fourth Time

For publishers, the first step is attracting audiences; yet maintaining their user base within a bustling media environment is just as important. Publishers today have the opportunity to keep folks on their platforms longer by curating highly personalized video playlists. Using AI-driven insights, publishers can figure out which specific content (from themes to locations, anchors and beyond) resonates with viewers to determine what an individual would be most interested in seeing next. For example, if someone is reading about a risqué joke made on a late-night comedy show, one can imagine that playing a video of one of the skits would resonate with the audience. But which one? How about content from another comedy bit? AI can unlock insights to help answer these questions, curating the ideal playlist that keeps audiences watching clip after clip,



AI can unlock insights into your audience.



David Mowrey is Head of Product and Development for Watson Media at IBM. With nearly twenty years of three-screen product development experience, David now leads product strategy and new business efforts

for the IBM Watson Media business unit. David previously served as Vice President of Strategic Planning & Business Development at IBM Cloud Video. He also served as Vice President of Product Management at Clearleap, an IBM company. Prior to his work at IBM and Clearleap, David served as Director of Media Solutions for Yahoo!, where he managed some of the company's largest mobile and telecom partnerships.

extending the opportunity to monetize video content and grow ad revenue.

...So Ads Aren't Such a Burden to Watch

Though 60% of video content viewers believe ads take away from their overall experience, stripping publishers of a necessary revenue stream is not a plausible option. The solution instead lies in creating an experience where consumers are so engaged with the videos they're watching that they are more willing to endure those advertisements. With AI technology revealing the best videos to complement news articles, consumers are more likely to watch the frequent advertisements that appear in between every couple of video clips, looking forward to the next piece of content. And with that level of engagement on their platform, publishers can charge a higher CPM for the brands that want to advertise with them.

In the coming year, publishers can best take advantage of new viewer traffic by implementing AI technology to generate deep understanding of their video content. 2019 will be a breakout year for publishers to engage audiences, drive the value of their content and subsequent advertising revenue up, and improve the overall experience for consumers in a today's competitive digital-media age. □

As Traditional TV and OTT Blend Together, New Challenges Arise

Interview by Nichole Janowsky with Nagra's Senior Vice President of Marketing, Ivan Verbesselt

Nichole Janowsky caught up with Ivan Verbesselt, Nagra's Senior Vice President of Marketing to discuss many of the pressing topics surrounding OTT today.

Nichole: Thanks for meeting with us. Please tell us how you believe the OTT market is evolving and how NAGRA is supporting that evolution?

Ivan: With traditional TV and OTT rapidly becoming synonymous, TV is simply considered TV no matter how or where it is consumed. The viewer is in charge, setting the tone for what the market must deliver to enable them to watch the content they love wherever, whenever and however they choose. In this environment, operators are playing catch-up. Driving innovation forward will depend on the service provider embracing its role as super aggregator to help consumers find what they want to watch easily and in a personalized way.

And, that's where NAGRA comes in. We help ensure efficient on-boarding of OTT content, effective content value protection and an elegant data-driven approach to content discovery – one that actively drives service loyalty and monetization, which are

key factors in today's TV landscape.

Our cloud-based and OTT solutions are perfectly suited for this new environment. They include cloud SSP, our cloud-based Security Service Platform, a unified and flexible platform for managing all operator content security requirements across all screens; advanced and off-the shelf OTT solutions, such as the OpenTV Suite and Conax GO Live; and a new low-latency Sports OTT Streaming offering that delivers an immersive fan experience for sports leagues and teams. All of our OTT solutions are suited for any device, including Android TV.

And, while OTT has opened up many possibilities for content owners and service providers, we can't ignore the fact that it's also fueled new forms of piracy, such as illegal IPTV services and Kodi add-ons – which are a huge area of focus for NAGRA. Ultimately, the solution to fight piracy is a combination of content protection, anti-piracy services and forensic watermarking – which we provide to protect premium content assets, fight pirate services across all distribution networks and ensure the best experience possible for viewers.



Ivan Verbesselt is Senior Vice President Marketing at NAGRA. Previously, Ivan was Vice President in charge of Alcatel's TV business, otherwise known as Information, Communication and Entertainment (ICE)

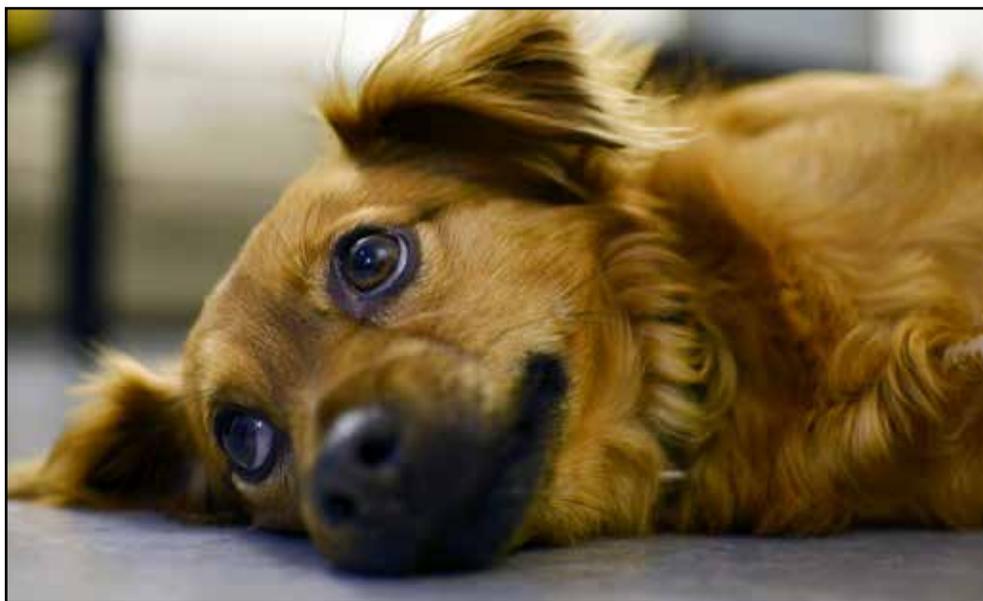
after having led the Product Marketing and CTO office of Alcatel's DSL business. Ivan started his career in telecommunications in 1990 with Alcatel's Corporate Research department and has held various positions in product management for broadband access products and services, both within Alcatel and Belgacom, and was Principal of Quadratio Consulting Ltd, focusing on Broadband TV.

Nichole: Cord-cutting is accelerating, and consumers are becoming more comfortable with their OTT content options. But they are still overwhelmed with their choices and how to discover content that is meaningful to them. How does NAGRA help them improve their user experience?

Ivan: That's a huge issue and pay-TV operators have the opportunity to play a key role to solve the problem, which goes straight to my earlier point of pay-TV embracing their role as super-aggregators. To expand, a super aggregator is a player that is consumer-facing, boasts a large user base, and is primarily a branded content distributor that delivers superior value for consumers through choice, flexible packages, price and convenience. This includes onboarding new content and being able to help consumers find what they want to watch easily and in a personalized way.

A successful super-aggregator will take a very pragmatic approach towards blending different OTT content bouquets into a coherent experience. We are moving towards a world where there will be a platform-agnostic approach to distributing TV content and video, blended together, and made available across all networks and devices. Users need to be able to switch between multiple services effortlessly with a simple, uncluttered and engaging interface that doesn't overwhelm them with options.

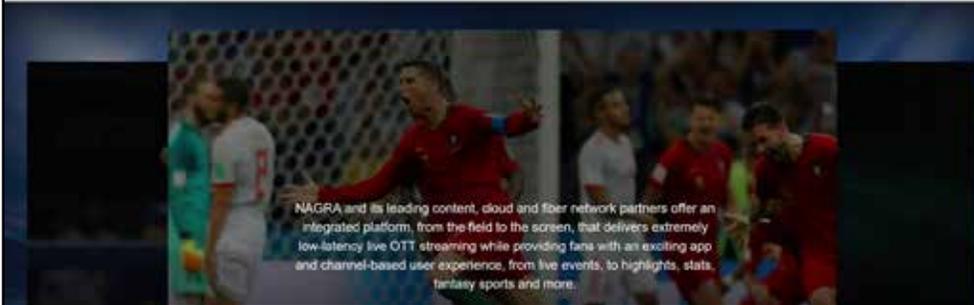
At the same time, UIs and backend business and security services platforms



Are you overwhelmed with all the OTT content choices?

We enable sports leagues, teams and rights owners to create unique connections with fans worldwide.

Reaching out to your fans on any screen, anywhere and anytime has become the new bar for the sports industry. Yet how do you scale video delivery, operations and reach to be successful?



Nagra's new OTT Sports streaming solution.

must create a bridge between content silos. With numerous needs to address, such as integrating various sources of content, running cloud operations and offering more flexibility, players in the M&E space must have the right strategy in place for success and these are all areas in which NAGRA can help.

Nichole: What about the role of data and analytics, how can they improve the experience—and does NAGRA have a play here?

Ivan: Absolutely. Today, more than ever, data, advanced analytics and AI are the keys to automating and improving customer service operations to reduce churn, delivering more relevant advertising, personalizing content recommendations, and helping companies optimize the full value and cost of their content portfolio.

While OTT and social media platforms such as Netflix and Facebook have built their success on the ability to capture, analyze and act on data and AI to deliver a consumer-driven experience, the pay-TV industry has been comparatively slow to adapt to the new analytics and AI-driven world.

Few have been able to properly collect, implement and use data to gain valuable insights to improve their pay-TV service and overall business operations. However, we want to change that, and developed a solution to harness data as the new currency.

NAGRA Insight is a pay-TV data analytics platform that leverages AI to drive subscriber value, content acquisition and management, operations and advertising. Through actionable insight, we help service providers deliver better business results and free up resources for next generation

platform investments.

Nichole: Piracy is a big topic these days and the threat seems to have grown bigger along with the growth of OTT. What is NAGRA doing in this space to help content owners and rights holders safeguard their assets?

Ivan: We couldn't agree more and have worked extensively over the last few years to help both Pay-TV service providers and content owners combat the threat, particularly in the area of live sports streaming.

Technology is proving to be a crucial tool in fighting commercial piracy (the paid-for pirate services) through the combination of anti-piracy services and watermarking technology. Coupled together, they allow service providers and sports content owners to identify illicit streaming services. They also enable them to identify the source of the content leaks feeding such pirate servers. This is now possible for both broadcast and OTT-distributed sports content, through a unique, invisible identifier (the watermark) added into the content itself.

A great example is NAGRA's work with Deutsche Fußball Liga (DFL). Focusing on IPTV piracy, DFL and NAGRA have collaborated to tackle pirated live sports content—a challenge requiring fast action given live sport is only valuable while it's happening. This has included a unique combination of forensic watermarking, takedown capabilities, technical countermeasures, legal action and a global network that provides DFL with the right foundation to beat piracy at its source.

Ultimately, the key to tackling this new sports piracy ecosystem requires the rights owners and distributors to forge a closer partnership with the TV and video ecosystem

at the regional and international level, while working with experienced anti-piracy vendors. It is also about communicating key messages effectively to consumers about the impact that illegal streaming, IPTV services and Kodi add-ons have on the future of premium OTT content including live sports.

Nichole: Nagra has been a leader in the industry for a long time. Does Nagra have any upcoming initiatives you can share with us?

Ivan: If I have to pick one that would most interest your readers, it would be our new OTT Sports streaming solution which I referenced earlier on.

We saw an opportunity to work with sports leagues, teams and rights owners to help them create unique connections with fans worldwide—doing so on any screen, anywhere and anytime—which has become the new standard for the sports industry. However, in terms of video delivery performance, operations and reach, this is challenging to accomplish.

Yet we're making it a reality. By collaborating with leading content, cloud and fiber network partners such as TATA Communications and leveraging other Kudelski Group technologies like SKIDATA's field-proven fan engagement solution, NAGRA is delivering scalable, low-latency streaming technology integrated with our OpenTV Suite to enable sports leagues and teams to deliver an immersive sports OTT fan experience directly to consumers worldwide, and on any device, including Android TV.

It's live OTT streaming "from the field to the screen" that also provides fans with an exciting app and channel-based user experience, from live events, to highlights, stats, fantasy sports and more. It also relies on our forensic watermarking technology and anti-piracy services to fight off pirate streaming services and protect the business model of sports rights holders.

We're very excited at the opportunities and look forward to sharing more in the near future! □



Bringing OTA and OTT Together: A Roll-Out Plan for ATSC 3.0 NextGen Broadcast

By: Fred Baumgartner

In 1995, in the United States, the *Grand Alliance* published what was to become ATSC 1.0—more commonly known as Digital TV. In 2009, the last analog stations in America signed off leaving an all digital broadcast television system. From the beginning, there were objections to ATSC 1.0 because of its inflexibility and very poor mobile performance. In time, as previously unforeseen OTT became viable, it became clear that a broadcast television platform that did not support all of what OTT offered would soon relegate over-the-air TV broadcast to antiquity. The ATSC 3.0 standard recently adopted and now being put on air aligns broadcast TV with OTT and supports very robust transmission into homes, offices, vehicles and portable devices.

Overview

NextGen Broadcast is the all-encompassing upgrade to the Internet that allows TV, radio and all manner of content to be distributed as IP, supplanting the linear and immutable century old ubiquitous technology that we know as traditional TV and radio.

For most of the Internet's 48 years, video – which now wholly dominates Internet volume and continues to grow – was impractical. It requires an expensive universe of fat pipes, edge servers, and managed networks to work around the Internet's limitations.

For all of Over-the-Air (OTA) Broadcast's 107 years, interactivity and extensibility – which is necessary for everything from dynamic advertising to supporting higher quality content, customization and any advanced user experience – was unrealized. Any number of piecemeal enhancements have been proposed, demonstrated and tested; but all have fallen far short of expectations as they were unable to break the basic bonds of Broadcast's technology legacy.

NextGen Broadcast promises to make the largest single improvement in the history of the Internet itself.

The Back Story

NextGen Broadcast has been in the making since the Advanced Television Systems Committee drifted away from a

backward compatible ATSC 2.0 standard to a greenfield ATSC 3.0. (ATSC is the organization that gave us the standards that drove the nearly 20-year long transition from analog to digital TV that concluded in 2009). The reasoning within the broadcast industry was that the interim 2.0 standard simply did not do enough because it left a long list of compromises and didn't improve TV enough to justify its use. Faultiest of all -- 2.0 was not extensible.

Broadcasting has historically depended on standards that define how it is transmitted (or modulated —*the physical layer*) and how it is decoded (or *demodulated* – broadcasting's layer 2) and displayed (all of the specifications that define how TV is compressed, etc. as in 720P and 1080i – skipping directly to layer 6).

ATSC 3.0 is basically a dumb, but very uniquely useful pipe with two principal use cases. The first is simply to replicate the standard broadcast function of delivering audio and video to simple TVs and radios. The second use case is far more interesting. Here, the NextGen pipe appends the existing Internet's pipe in a home "NextGen gateway" at Layer 3—IP network. Done correctly, the combined ("hybrid RF/IP") bits are indistinguishable to the higher layers. In the simplest view, NextGen implements a form of Layer 3 Least Cost Routing (LCR). Bits that need to go to many destinations with maximum quality in real-time, go through the NextGen RF Internet pipe. Everything else—return communication with viewer requests and data, content with few destinations, and all the usual email and WEB traffic—remain on the traditional Internet infrastructure.

Why that Matters for Streaming

The most demanding streaming is for live (real-time) high bandwidth, high QOS applications; the Super Bowl, Olympics, Presidential addresses, etc. ATSC 3.0 provides inexpensive, high QOS distribution that relieves the wired/wireless RAN Internet of much of this burden. The *OTA broadcast* part is key. The architecture of NextGen creates a simple, one-way, radio frequency path that bypasses all of the walled gardens, congestion, hand-offs, ISPs and



Fred Baumgartner is a long-time broadcast engineer with a background in Over-the-Air, OTT, mobile TV, Cable and Satellite TV who has been an architect and consultant for implementation of new and often disruptive media technologies.

other impairments that make massive OTT streaming on the Internet challenging.

It's easy to see that the OTA/OTT architecture has a cost of delivery that can be orders of magnitude less per viewer than the existing infrastructure. More than that, the cost of the existing OTT infrastructure can be reduced by leveraging NextGen's ability to off-load a significant amount of peak traffic. A popular metaphor is to say "that NextGen adds an HOV lane to the Internet highway."

How it works

NextGen Broadcast uses the current TV spectrum. In the United States, what remains of the UHF broadcast TV allocation is the bandwidth between 470 and 608 MHz (Channels 14-36) after the "repacking" is complete. The VHF spectrum remains (Channel 2-13), but the lower VHF frequencies don't have the reach UHF does, and thus are more useful for things other than NextGen Broadcast to mobile devices. VHF is suitable for feeding NextGen home gateways where larger and often outside antennas are viable and as a Studio Transmitter Link (STL) to feed Single Frequency Network (SFN) Booster stations.

Figure 1 illustrates the relationships between the video display devices, the existing Internet and NextGen Broadcast. For OTT video distribution, the existing Internet attempts to mitigate its limitations with technology like Adaptive Bit Rate (ABR) encoding, and Content Distribution Networks (CDN) with edge servers to provide high-quality service. Every viewer represents a unique stream and the investment in infrastructure must be made to accommodate that. Rural Internet customers are particularly hard to supply as bandwidths are often limited

often to that available from Wireless Internet Service Providers (WISPs) or IP-satellite services at costs that are significantly higher and speeds that are significantly lower than urban customers experience. Making OTT available to wireless users requires a Radio Access Network (RAN) that we know of as a plethora of carriers, cell towers and cell sites. The last mile to most homes is via Cable TV, Telephone wires, fiber and IP satellite services. The conventional last-mile and RANs are all expensive but expensive.

Figure 1 also shows NextGen's overlay to the existing Internet. Rather than an ABR encoding with various quantum steps of quality to accommodate the wide range of QOS the Internet provides, NextGen Broadcast can deliver content with different payload sizes and different robustness. Part of NextGen's extensibility is that broadcasters can break up their service into Physical Layer Pipes (PLPs) and each can have a different throughput and robustness. Consider a broadcaster that elects to send both a very robust but bandwidth limited service on one PLP, and another payload intensive but fragile PLP. The robust payload is suitable for mobile devices in a hostile Radio Frequency (RF) environment. The other is suitable for where a home NextGen gateway has a non-moving (fixed), well-placed (often a "leaf" antenna in a window -- and in the case of rural homes, a roof-top) antenna.

The NextGen Broadcaster is likely to take advantage of Scalable Video Codecs (SHEVC). Here, a "base layer" of content is transmitted robustly. Devices that can

take advantage of higher bit rates (larger displays) and can receive the more fragile "enhancement" layers will decode both layers. Unlike ABR, scalable video-enabled receivers don't waste the lower bit rate encodes, but build upon the base layer to make a better picture.

QOS in NextGen Broadcast isn't dependent upon the ever-varying effects of having to share the "best effort" infrastructure that dominates the WEB streaming conversation; instead it's simply about whether one can receive a given PLP. When a PLP can be received reliably, the quality is unimpaired, lossless and perfect -- regardless of how many viewers are watching or whatever other traffic issues exist anywhere else on the Internet.

NextGen has two powerful tools to extend connectivity and improve it. On the user side, it's the receive antenna. For a few dollars, even a distant rural customer that can only receive Internet services via satellite, can likely receive NextGen Broadcast services. In the case of a smart phone, the antenna is built-in and thus a compromise, so a robust signal is necessary for a good experience. Unlike current broadcast services, NextGen Broadcast uses *orthogonal frequency-division multiplexing* (OFDM), OFDM enables booster transmitters all on the same frequency without interference in a SFN. Present-day broadcast -- and wireless RANs for that matter -- achieve expanded coverage by inefficiently using additional and diverse spectrum. ATSC 3.0 synchronously reuses the same spectrum at each SFN booster site to enhance service reliability. NextGen UHF

transmission can utilize up to 1,000,000 Watts effective radiated power (ERP) under current regulation. The wireless RAN must limit interference between towers and the power allowed is much lower, typically in the 100-Watt range.

Figure 1 also shows that content is fed to both NextGen and streaming encoders. Being able to move seamlessly between the legacy Internet and NextGen service improves the experience of both. This creates a hierarchy of accessibility. If a device can receive the full OTA feed and take advantage of it (small devices are unlikely to be able to use the enhanced, high resolution content), they do. If the OTA feed is completely unavailable -- even the low payload-high resiliency base layer -- the device goes to the Internet if available and negotiates the highest data rate available that it can use.

There are complexities with both content restrictions and cost. While the WEB feed might be available anywhere, current broadcast TV content is most often restricted for use in a defined geographic area (there are 210 DMAs [Designated Market Area] in the U.S.). Some content rights prohibit Internet distribution entirely (the reasoning is that it may be easier to misappropriate and the quality might degrade the product making the viewer experience less than desired and impacting future views). By tradition, if you can receive the OTA signal, you can watch it even if you are outside of the DMA. Satellite, Cable and "translators" (small transmitters that rebroadcast to hard to reach locations) can relay a TV station's program to viewers, but usually only within the DMA. Internet streaming has similar restrictions. There is a gray area where a viewer can -- via the Internet -- view content from the home, including local stations, anywhere. NextGen might be the opportunity to formally extend that privilege for those who might want to watch local news, etc., while travelling.

Cost too is an issue. While viewers are important in TV's ad supported business model, margins are often too thin to profitably support the Internet CDN costs. Conceivably, a viewer whose smart TV or smart phone reverts to Internet connectivity, might ask the viewer to pick up the additional cost.

The initial buildout of the wireless RAN and cell phone service first used a sparse network of long-range cell sites. Over time, additional sites were brought on-line to fill in gaps and shadows and better reuse spectrum. The RAN is constantly being improved as economics dictate. It is likely that NextGen broadcast will follow a similar path. You can't realize revenue if the customer can't access your product. The end game for NextGen is to have the entire UHF spectrum in use to provide nearly seamless coverage

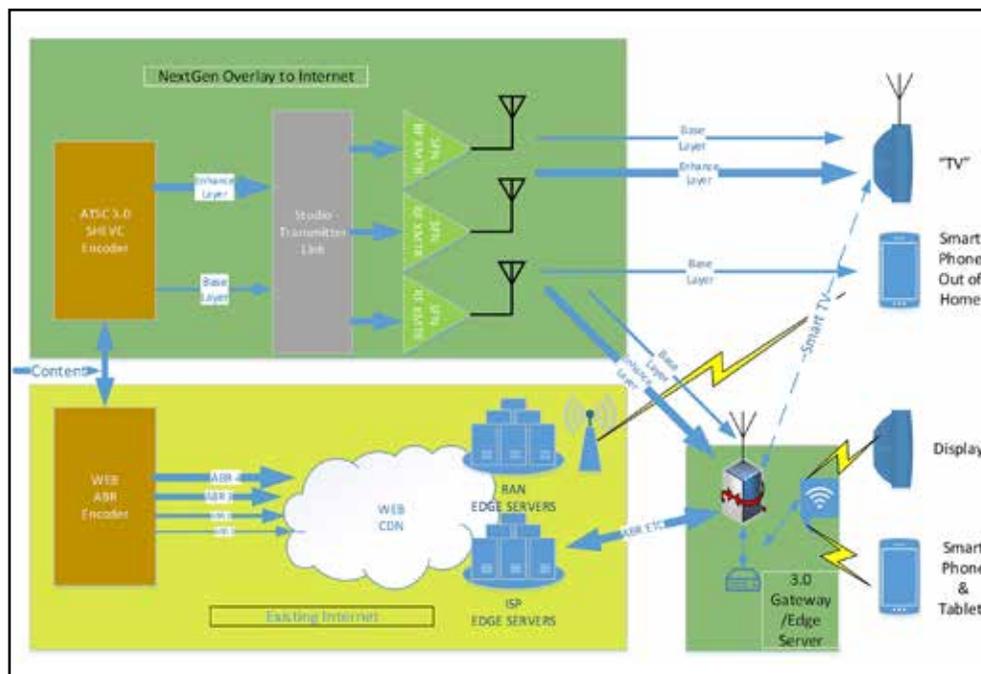


Figure 1: NextGen Broadcast provides a simpler, less expensive, higher quality IP delivery path that is perfect for mass distribution of content.

from coast to coast. Current FCC regulations do not allow this, but regulations can be changed.

As with the wireless RAN, building penetration is important. With more SFN NextGen boosters, penetration improves and with more signal, you can also increase payload size. Because for broadcast, a kilowatt at the corner is better than a Megawatt on the mountain, NextGen SFNs are likely to be constantly developing with time.

Devices

Figure 1 shows that NextGen can be received directly by a 3.0 ready smart television receiver, and if connected, some interactivity and viewing data can be returned. Inserting spots in programming as part of any digital ad insertion (DAI) scheme is difficult given the likely limited on-board storage. Most schemes reward DAI-connected customers with special incentives that are not offered to those that are not connected. A smart TV needs to receive any insertion from the Internet either exactly when needed, or moments before, if cache is available.

Smart phones and tablets are a very special use case. They are used as a portable smart TV, but they can also be used as a very capable TV remote control in the “second screen” scenario or out-of-home (OOH), extending the viewer’s access to their content while they are mobile. Mobile/portable viewing represents a large audience that currently is not directly accessible to broadcasters due to technology limitations. Nor is it efficiently or reliably reached by OTT on the Wireless RAN in the same way supported by NextGen. For this reason, most broadcasters have a “mobile first” strategy in place for their conversion to NextGen. Vehicles also play into this scenario as elaborate audio services to update the car radio are planned by some, while others look to NextGen as an economical means of updating maps and real-time services like traffic and very detailed road hazard and other information.

The world of IOT is also certainly a beneficiary of NextGen broadcast. As with any disruptive and enabling technical advance, it is impossible to see what the world will be like as it matures.

The NextGen “Gateway”

There is not yet a good name for this critical piece of hardware. It has to exist in some form, although there is great latitude in what functions and features it will support, or whether it is hardware or a cloud service. A smart phone or smart TV will have some limited version of the NextGen gateway functionality.

Each NextGen home service gateway has

the typical WAN/ISP connection. What is unique is that it also has an “RF front end,” that connects to an antenna that receives the broadcast NextGen signals. With any luck, broadcasters will share tower sites and architecture, so all channels have nearly identical coverage. This level of cooperation both keeps the costs of the distribution network low and makes NextGen a better more consistent service. In an urban, well-covered area, the antenna might be a simple “whip” antenna attached directly to the gateway device, probably via an F-connector as is traditional for TV antennas and cable TV.

More often, a “patch” or “leaf” (they look like a leaf from a tree and are widely used for DTV reception) stuck to an outside window is ideal. In rural America, the traditional UHF outdoor TV antenna attached via a coaxial cable is called for. Internally, multiple tuners, usually four, receive the channels as needed. Multiple tuners allow the gateway to do more. In time, the technology will likely shift to front ends that continuously and seamlessly receive the entire 138 MHz width of the UHF NextGen band.



The rest of the NextGen gateway is familiar. There is likely a WiFi hotspot built in and probably an Ethernet port or two for physically connected devices in the home LAN. There needs to be a substantial amount of storage. There also needs to be substantial processing power. The NextGen gateway closely resembles a home media server system.

The core of the NextGen home gateway is the middleware that manages a very large assortment of functions. Managing the network connections is the primary purpose. Implicit in that is conditional access (CAS) and encryption. Even if the content is to be consumed without cost, there is likely to be a requirement that it is distributed encrypted. Rights management can be complex, but it tends to apply to the whole home, so managing this in the NextGen gateway rather than each device makes sense. More than that, devices in a home work best when they work together. Simple things like the “second screen” experience, where a tablet or smart phone is used as a remote control for the larger screens and to enable social media in conjunction with the content being consumed require this NextGen gateway.

Another way of looking at the NextGen

gateway is as the ultimate edge server. The closer the edge server the better the performance. Some functions are well known and popular. Digital Video Recorder (DVR) functions and common media storage can be supported for the home from the NextGen gateway.

Digital Ad Insertion (DAI) is a must for most business plans. Current TV broadcast advertising is very inefficient in that unlike the world of Internet advertising ad tech; TV commercials are broadcast to lots of people who have no value to the advertiser. DAI can change that for broadcasters. The NextGen gateway can store the spots for insertion and host the ad decision machinery that selects the ads to be played and reports back that an ad has been properly placed for billing purposes. Of course, part or all of this can live in the cloud, though there are caveats. One edge case is the Super Bowl. If every time a commercial availability comes along, every NextGen household pulls the spot from the cloud, it represents a lot of peak demand. Then there are the cost and quality of service issues. Is it better to have the commercial placed once at the NextGen gateway (aka local edge server) than to pull it repeatedly from the CDN?

The NextGen gateway also has to manage different devices and displays. This is more than transcoding -- the desired user experience allows viewers to change rooms and devices seamlessly. Handling different device user interfaces is challenging. In any case, the user experience and profitability depend upon the NextGen gateway, user experience and extensive and improving middleware and applications.

When?

Speed of adoption, or success at all, is always difficult to predict. Broadcasters need NextGen broadcast, and the basic conversion of an existing transmitter is fairly inexpensive and easy. Something like half the country is expected to have their first NextGen coverage in the next year or so. How quickly and how viewers are incentivized to bring NextGen gateways, or even ATSC 3.0 TVs, into their lives is yet to be determined. But one thing is for certain; NextGen broadcast has the potential to dramatically affect both the OTA and OTT video businesses. □

DRM Pricing Demystified

By: Gabe Elton

Last year, in “Purchasing DRM Services: An Insider’s View” I wrote about different options for purchasing DRM. In that article, we compared Service Agreements vs. Software License Agreements and explained the various models offered by DRM vendors and how they relate to your business.

With this piece we hope to further demystify questions around DRM pricing that will further your understanding of how DRM fits into your budgeting requirements.

We will be focusing on DRM as a Service (DaaS) rather than a perpetual software license model.

How is DRM Usually Priced?

The most common format of DRM pricing that you will see across the industry usually includes differing buckets of licenses that are included each month as part of your monthly fee. Once the bucket has been depleted in any 30-day cycle, overage tiers are offered that become less expensive the more licenses that you use.

These buckets start as small as 10,000 licenses and move on to infinity. Packages may include tiers, such as 40K, 400K, 4M, 40M and Unlimited licensing. The more licenses that you buy, the less expensive they become per license.

What is a License?

The next obvious question becomes – what do you consider a license? In order to implement DRM, there are three major things that need to happen.

1. In order to encrypt the content, it must be encoded into a suitable streaming format and then packaged using encryption keys – MPEG-DASH packaging for PlayReady and Widevine DRM technologies, and HLS packaging for FairPlay DRM technology.

2. The Middleware or CMS must be able to allow you to authenticate your user and pass a token or an authentication xml to the player. This authentication xml is encrypted and digitally signed by you and includes the rights that you would like to express to the user.

3. The player will notice that the content is encrypted and first check to see if it already has a license to play the content. If it does not, it will ping the DRM services’ server for the decryption key.

Each response = 1 license with each license tied to the specific device that is consuming the content.



Gabe Elton is the Director of Sales at BuyDRM. Gabe is an expert in helping large-scale Media and Entertainment brands navigate through the various studio-approved services and solutions required by content owners and offered through the KeyOS Platform. By assisting customers in dozens of countries and on every inhabitable continent, Gabe has developed the knowledge and insight to understand the complexities of the OTT Landscape and how important content security is to that puzzle.

How often that happens depends on several different factors. The first is how that content is packaged. In a VOD scenario, if each title is packaged with a separate encryption key, a new license will have to be delivered for each new piece of content viewed on each device. However, if an entire catalogue of content is encrypted with a single key, a single license will unlock the entire catalogue.

Similarly, for live content, if each channel is packaged with a separate key then each channel will require a separate license. If they are packaged with the same key, then a single license will unlock them all.

Can Licenses be Persistent?

Another factor to consider is which playback platform the content is being consumed on, and perhaps more importantly, does the player support persistent licensing. Downloads of DRM-protected content have been supported for nearly a decade now. However, the main question here is not whether your DRM Service provider supports persistent licensing and downloads, but whether your PLAYER supports it.

The reason this becomes important is that, depending on the playback platform, an O/S embedded player, Set Top Box player, HTML5 player, or A/V player may be closed or otherwise shut down, and it will not store the license. This means that even if the same device or same user were to try to access the same piece of content, a new license will need to be delivered.

You should look for Players and Player SDKs that support downloads and persistent



licensing as a standard feature. This means licenses can remain on the device after the initial play, avoiding the need for a new license to be requested and delivered each time the downloaded content is played within the license's term.

But Wait, There's More

DRM service providers offering multi-format support are generally agnostic to how your content is packaged or how long you would like a license to remain valid on the viewer's device. From their standpoint, while not best practice, you could package all your content with the same key and leave the license valid forever (if the player supports it). However, the content owners probably have a different opinion.

In order to estimate your license usage, it is important to review your agreement with the content owner or licensor. Content owners will most likely require that you package each piece of content with a different key. They may even have requirements around how long those licenses can remain valid. With live content, they will most likely also

have terms around how often those keys must be rotated.

Without knowing the terms of the agreements with the content owners and the habits of your users, budgeting for DRM purchased on a consumption-based model is nearly impossible.

Per Device Pricing

For many DRM service buyers, it seems that the simplest, most convenient business model would be built on a flat, per-device or per-subscriber fee. Indeed, this would make life much easier for budgeting, and for this simplicity buyers may be willing to pay more. Fixed DRM costs are easier to work into the pricing structure and business plan and, once accounted for, can easily be covered. Some DRM service providers have taken on this challenge, but it is important to recognize that since the actual costs scale with consumption, these service providers are accepting the risk of unexpected consumption and unanticipated costs. As a result, these models will be priced to cover the risk.

At BuyDRM, we have been working on such a model internally and are very close to releasing standardized flat rate pricing based on devices and/or users. However, based on our experience, the least expensive route from the customer standpoint is clearly conventional consumption-based pricing. But if the ability to easily budget and factor in costs associated with DRM into your downstream business logic exceeds the fear of a consumption-based model, you will be happy to learn that per device and/or per user pricing model availability is increasing.

Which Works Best for You?

For customers willing to pay the additional cost of risk mitigation in order to streamline their budgeting requirements, service vendors like ourselves at BuyDRM are beginning to offer the flexibility to choose a flat per device/ per subscriber pricing model. Depending on your budgeting needs and audience demand variability, you may find this a valuable alternative to the more conventional consumption-based models. The choice is yours. □



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Why the Content Hub Could be the Answer to Today's Streaming Wars

By: Brice Clinton

With new streaming platforms on the rise — from Walmart, ESPN+, Disney+, FOX and NBC, coupled with giants like Netflix, Hulu, and the like — the way we consume content is changing drastically. What does this shift translate into for an ideal consumer experience? Options, options, and more options.

Streaming providers offer a myriad of choices to grow revenue and compete with companies not typically in their competitive mix. A perfect example — Walmart (with its Vudu service) entering the programming space to compete with Netflix's production and service model.

On the surface, it may seem advantageous for consumers to be given nearly limitless options from non-traditional content creators and distributors; however, it can pose a challenge to service providers and consumers alike. For service providers that challenge is ensuring profitability and staying competitive in an increasingly large field of players. For consumers it is options, options, and more options. With a new, unprecedented emphasis

on content—specifically original content—providers must change the way they value and monetize their programming.

Disruption Changes the Competitive Landscape

The streaming wars are a never-ending cycle of providers working to be number one when it comes to content consumption — which at their inceptions was volume play. As that streaming market has grown and brought those consumers that volume of content, the focus of those consumers has shifted to stronger quality of content, not quantity. The leader in the space, Netflix, took this route in their past; churning out loads of content, but quickly realizing that quality perhaps plays a bigger role in their overall business strategy. In pursuing the volume play, Netflix inadvertently created a new set of growing pains moving from a content aggregator to a content creator.

However, when original programming can only be accessed on a singular platform, it drives up the cost of quality programming.



Brice Clinton is a Senior Engineer at CSG where he builds the strategies and solutions that power digital media services, content delivery, digital service monetization and cutting-edge consumer experiences. Brice also serves an Adjunct Professor at Northwestern University where he leads a course devoted to technology in sports.

The dramatic (and positive) impact of this was on prime display at this year's Oscars where Netflix's programming earned the company multiple Oscar nods, including a Best Picture nomination for *Roma*. Though not Oscar-nominated, *Bird Box* starring Sandra Bullock was watched on a whopping 45 million Netflix accounts. All of these examples demonstrate that for those providers who want to deliver on a superior content promise, they're going to have to invest in the best content creators, directors and actors for the job.

Thus far in 2019, we've seen providers double-down on this strategy, with both Netflix and Hulu raising their prices this year to allocate more funds to creating more original programming. On top of this, all three major streaming providers (Netflix, Hulu and Amazon Prime) invested in ads during Super Bowl LIII to promote their own original content, with Netflix doubling down and releasing the trailer for *The Irishman* during the Oscars. Netflix, Hulu and Amazon Prime are all looking to allocate funds to creating original content, which includes increasing the speed of production and better meeting their audiences — the 21st century family who is looking for more niche programming.

Choice is Empowering, But It Can Also be Paralyzing

Content consumption for consumers, along with many other facets of life, is now fraught with the paradox of choice. Today, increasing numbers of consumers subscribe to more than one service (Netflix, Hulu, HBO Now and others). On top of that, there are choices within each provider. Netflix, for

The streaming wars are a never-ending cycle of providers working to be number one when it comes to content consumption - which at their inceptions was volume play. As that streaming market has grown and brought those consumers that volume of content, the focus of those consumers has shifted to stronger quality of content, not quantity. The leader in the space, Netflix, took this route in their past; churning out loads of content, but quickly realizing that quality perhaps plays a bigger role in their overall business strategy. In pursuing the volume play, Netflix inadvertently created

Streaming wars are never-ending.

example, offers three subscription offerings, depending on the number of devices and the content quality that the consumer desires. Hulu offers a regular service, an ad-sponsored service and a live television service. When prices (inevitably) go up, consumers will start to make the choice of which service to cut, meaning the Netflix price increase might not impact Netflix, but it might cause consumers to rethink other subscription services, especially if they don't see the inherent value when comparing their various streaming platforms.

Ultimately, there is a tipping point for consumers when they will reevaluate the services they invest in. According to my Gen Z class of students at Northwestern, this tipping point is \$20 – for some consumers it could land slightly above or below, but the important point to note is that the growing number of services available are causing consumers to zero in on this cost, and what services provide the most value. Consumers will have to consider if they're most inclined towards a strong content library, like Disney's streaming services say they'll offer, or a better technology experience created by more

veteran providers like Netflix, or services that integrate directly with a consumer's cable box.

A Hub to Organize the Many Options

With a growing number of subscriptions to manage, consumers are increasingly craving a universal hub to view all of their favorite programming. This hub must serve as one place where consumers can search all of their video content, while also providing a consolidated billing and payment service to manage their subscription in one simple invoice. A sleek interface accompanied by integrated search, voice commands and on-demand recommendations will also improve the user experience by providing more customizable content.

According to a recent survey from CSG, 46 percent of streamers value featured bundles that can manage all of their subscriptions – especially millennial subscribers. To meet the consumer need for a universal hub, OTT providers may revert back a bit and lean on traditional service providers, like cable, to serve as this unifier. This will allow them to reach a wider audience and ease the

consumers' ability to watch and pay for their programming.

There will come a point when consumers are going to feel overwhelmed by the streaming options on hand and the prices that come with them. For service providers to hold onto consumers, they need to look for ways to differentiate from the competition and create an unparalleled offering for consumers. Giving consumers options when it comes to ease of access and content quality are huge factors that ultimately influence what services or platforms end up on the chopping block. □

OVER THE TOP VIDEO Executive Summit

OTT Executive Summit Speakers 2019

Keynote Speakers

- Piper Rosenshein
- Stefan Van Engen
- Stephen Strong
- Sarah Eisenberg
- Adam Noble
- Christian Petersen
- Bernarda Duarte
- Peter Chelala
- Lionel Bringuier
- Andrew Hare (Magid)
- Soumya Sriraman (britbox)

Fireside Chat

- Deepakjit Singh
- John Lawson
- Denise McManus
- Michael Smith
- William Sager
- Chris Knight
- Katia Loisel
- Kurt Michel
- Eric Bolten
- Blake Sabatnelli (newsy)
- Harold Morgenstern (PLUTO)
- Hannah Brown (fubo TV)

Speakers

- Brian Mahony
- Dave Zimmer
- Adam Lewinson
- Virginia Juliano
- Stephen Johnson
- Chris Wagner
- Tim Eaton
- Rob Yarin
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Is OTT Really More Expensive Than Other TV Buys?

By: David Wiesenfeld

A common perception among advertisers is that OTT is expensive ... but is that really the case?

This is an important question to get right. The notion that OTT is costly can dramatically affect media plans, relegating OTT to a supporting role when strategically it ought to play a big part. The belief that OTT pricing is literally “over the top” is an oft-cited reason for deploying it on a limited basis against narrow objectives, such as achieving incremental reach among cord cutters or down-funnel targeting of prime prospects.¹

Using OTT as an adjunct can sell your TV investment short, especially for brands with qualified buyer sets (e.g., baby gear, pet food) or specific target audiences.

Consumption of ad-supported OTT continues to grow at 30% - 40% annually,

and ad inventory across OTT publishers is increasingly transacted through unified platforms. Many advertisers are now executing precision-targeted OTT campaigns with the scale, simplicity, and consistency of network buys.

That leaves price perceptions as one of the few remaining barriers to large-scale OTT buys. Linear TV also offers advanced data-driven targeting, which is typically less expensive than OTT on a CPM basis. Are indexed linear buys a more cost-effective way to do targeted TV than OTT?

Refer to Figure 1 to see a real-world example that highlights the cost differences between indexed linear and OTT.

Indexed linear uses data to improve the targetability of traditional TV. But you’re still buying shows, not audiences. And that makes all the difference.



David Wiesenfeld is the Chief Strategist at Tru Optik, responsible for aligning Tru Optik's services and deliverables with marketplace needs. David has over 20 years' experience in consulting, strategy development, and digital media with both brand advertisers and service providers.

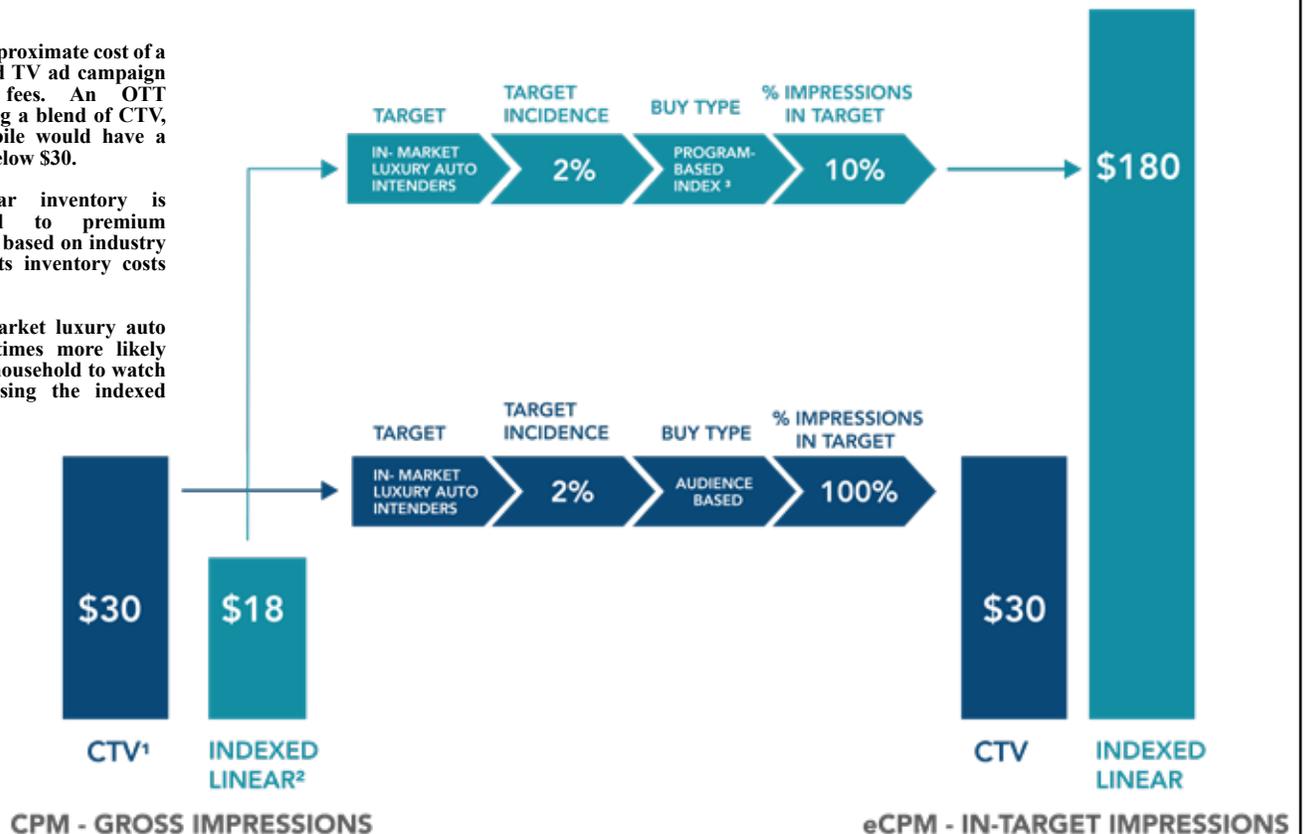
In the case below, a luxury car manufacturer can buy commercial time on a set of shows that is 5X more likely to be watched by consumers in the market for a luxury car than by the average household. But if only 2% of the population is in the market for a luxury car, then 90% of impressions still miss the mark.

Figure: 1

1. \$30 CPM is approximate cost of a targeted connected TV ad campaign including data fees. An OTT campaign featuring a blend of CTV, desktop, and mobile would have a composite CPM below \$30.

2. Indexed linear inventory is typically limited to premium content. \$18 CPM based on industry interviews. Reflects inventory costs plus data fees.

3. Assumes in-market luxury auto intenders are 5 times more likely than the average household to watch programs comprising the indexed linear buy.



OTT allows the advertiser to target just the 2% of consumers shopping for luxury cars.

As the example illustrates, OTT's audience-based approach is far more efficient at reaching the target, yielding an in-target CPM (aka "effective CPM" or eCPM) six times lower than the eCPM for indexed linear. More TV advertisers are using eCPM to account for the variations in targetability across different forms of television.²

Indexed linear can also come with an opportunity cost. Not all luxury car intenders will necessarily watch one of the shows in the indexed linear buy during the campaign flight. Because the OTT buy is audience-based, it does not depend on a set of programs to act as a conduit to the target. Luxury car intenders have the opportunity to see the campaign on OTT regardless of the content they consume.

Advertisers should always request target reach estimates for linear buys as well as OTT buys. These days OTT can reach specific audiences as effectively as linear TV and with greater efficiency—especially for younger and more affluent targets.

There are cases in which indexed linear in combination with OTT is the sensible approach. Brands that appeal to a broad swath of consumers might achieve their campaign goals more efficiently via indexed linear or even traditional linear, with a layer of OTT to deliver specific messaging to key groups. An example would be a well-established coffee brand whose main goal is brand reinforcement among coffee drinkers but also wants to highlight a new flavor to conquest heavy users of its main competitor.

Taking targetability into account flips the perception that OTT is expensive relative to linear TV. As OTT continues to siphon

viewing time from traditional TV, it starts to raise a new question: What is the value proposition of linear TV advertising relative to OTT?

That's one advertisers will be asking more frequently in 2019. □

References:

1. Perceived cost was #1 factor inhibiting use of addressable advertising (mainly comprised of OTT) in a 2017 study commissioned by AT&T AdWorks and Advertiser Perceptions. Ahead of the Curve: Addressable TV Insights. https://www.thevab.com/wp-content/uploads/2017/10/ATT_WhitePaper_2017.pdf
2. Approximately one in four advertisers use eCPM in media planning and the majority of advertisers recognize its benefits. Ahead of the Curve: Addressable TV Insights. https://www.thevab.com/wp-content/uploads/2017/10/ATT_WhitePaper_2017.pdf



Congratulations to our past OTT Executive Summit winners!

Past Winners:

NYC 2018

- "OTT Genius"— Suzanne Mei, People TV
- "OTT Hero"— Adam Lewinson, Tubi
- "OTT Guru"— Greg Bernard, ION Media

NYC 2017

- "OTT Genius"— JR McCabe, Poker Central & eSports Productions
- "OTT Hero"— Nick Buzzell, NBTV Studios
- "OTT Guru"— Paul Hamm, Endavo

NYC 2016

- "OTT Genius"— Kurt Michel, IneoQuest
- "OTT Hero"— Don Wilcox, PBS
- "OTT Guru"— Roger Keating, Hearst Television

NYC 2015

- "OTT Genius"— Brian Balthazar, Scripps Networks
- "OTT Hero"— Rich Antonello, Complex
- "OTT Guru"— Rick Howe, The iTV Doctor

NYC 2014

- "OTT Genius"— Jean-Michel Planche, Witbe
- "OTT Hero"— Amit Ziv, EPIX
- "OTT Guru"— Steve Harnsberger, OTT Digital Services

Boston 2014

- "OTT Genius"— James Norman, Pilotly
- "OTT Hero"— Jim Turner, Net2TV
- "OTT Guru"— (Tie) Gabriel Dusil, Visual Unity; and Jason Thibeault, Limelight Networks



1st Place



2nd Place



3rd Place





Reigning in the Complexity of Monitoring OTT Streams

By: Erik Otto

The global consumer demand for video-on-demand (VOD) and the industry's increasingly ambitious attempts to reach them may never see another year like this one. To the already heated battle led by Netflix and Amazon, we can anticipate the launch of AT&T-owned WarnerMedia's SVOD fed by Turner and HBO content - possibly to coincide with the final season of *Game of Thrones*. Disney, after wrestling with Comcast for the right to own Fox, will launch its "Disney +" direct to consumer service featuring a first *Star Wars* live action series. Apple's highly anticipated launch of a video app is also in the cards, as are others such as ITV - if the UK's broadcasters don't launch a collective SVOD service first.

With premium content being split in all directions, this explosion of OTT will be a feast for the consumer, while at the same time creating confusion. It is also likely to be highly challenging for the technical teams of any broadcaster onboarding these new offerings onto their platform.

There is simply no division in the audiences' mind between a programme

broadcast and a programme streamed. The same standards for video, audio, and captioning that apply to traditional television apply to OTT as well.

Not only do engineers need to ensure compliance for content viewed on multiple devices and delivery outlets, they must also ensure a quality of service (QoS) to meet the contracts struck with providers. Keeping up with this complexity can be daunting, and that's even without throwing live-streamed content into the mix.

Compared to traditional broadcasts, OTT video is not only more complex, but also cloudier. Operators need to rely on Content Delivery Networks (CDNs), or in many cases, several third-party networks in order to deliver content. Depending on the setup, Adaptive Bit Rate (ABR) streams can be encoded and pre-packaged in advance before reaching the CDN's cloud.

There should be little difference in picture quality once reaching edge locations and on to the final viewing device. Though content may be correctly streaming from the playout encoder, an edge location may experience



Erik Otto, CEO of Mediaproxy began his career in media after studying applied engineering far too long ago. He's has had an extensive career working in audio engineering, television broadcast, computer graphics, digital film and high-end computing. Erik has also founded XDT Pty Ltd, which develops the fast data transfer solution Catapult. The software-based solution enables media companies to efficiently utilize internet and VPN connections via its UDP accelerated transfer protocol.

its own issues, which could be local or originating from within the CDN. However, it's very difficult to monitor exactly what is happening to OTT video downstream of the CDN.

When relying on CDNs for OTT services, it's important that ABR streams are monitored and logged not only from playout, but also from various edge locations. There are a number of issues that may occur within CDNs or at edge locations which may not be immediately apparent by only looking at OTT playout. These could include local blackouts, hosting and bandwidth issues.

To address this, a monitoring solution must enable broadcast engineers to monitor and view both playout to the CDN and edge server return feeds streams side-by-side.

In some cases, broadcasters may decide to further process OTT playout streams in the cloud. In this scenario, a high-quality mezzanine video stream is streamed to a cloud-based encoder, which then transcodes it into multiple ABR streams. The final step of packaging those streams into different formats, including HLS and MPEG-DASH, can occur within the cloud or at the edge. As a result, any effective monitoring solution must be able to capture, monitor and compare streams at any and all points along an OTT delivery path, whether they be in the cloud, or on premise.

Better OTT delivery with better data

As TV broadcasters adopt IP technology including media over IP (NDI, SMPTE 2110) for production, engineers are able to track



and analyse detailed metadata, which can help identify issues across the entire OTT delivery chain. Operators also need to be able to keep tabs on digital program insertion triggers (SCTE-35), loudness levels and closed captions across multiple video sources within a single transport stream.

When it comes to monitoring live channels over multiple OTT streams and ABR profiles, it is no longer practical for display panels to mirror all the possible video outlets. The human eye simply can't monitor so many different profiles simultaneously. To address this issue, one needs to have a monitoring solution that aggregates and displays an array of information for use in master control rooms. This solution should allow OTT operators to custom-configure both data and video information panels for monitoring transcoded feeds and edge streams.

By being able to dynamically arrange how specific information is displayed, engineers and master control room staff are given a high-level view of all transport streams, including incidence alarms, in a context they understand and are well-trained in. Extensive live-stream monitoring and post-broadcast reporting tools are able

to capture and visualise transport stream and OTT data, and track critical video and audio errors including signal loss, picture freeze, and blackouts alongside data panels displaying the bandwidth, URL and manifest information for multiple edge points. Specific bandwidth thresholds can also be configured to raise alarms when ingest encoders or edge points go below or above what is expected.

As targeted advertising becomes an increasingly important revenue stream, the ability to report on specific edge location streams including SCTE-35 triggers and monitor replacement content streams is becoming imperative.

By being able to flexibly deploy software on premises, within virtualized environments, or in the cloud, broadcasters can log, analyse, and monitor OTT streams from anywhere within a single unified interface. Using such software, operators can reconcile and compare originating transcoder outputs to CDN edge points using both traditional broadcast and data-centric panels.

Making quality control work for you

With the advent of OTT services, playout is no longer the final point of quality control. Going further down the content

delivery chain, CDN edge points, targeted ad-insertion, multi-language support, and event-based channels require the expert scrutiny of broadcast engineers. Fortunately, the tools are available to enable centralized monitoring of what is happening to your live video content beyond playout.

Broadcast logging has evolved from a narrow compliance role to a much broader range of applications encompassing monitoring, analysis and revenue-generating functions for broadcasters, MVPDs and OTT providers. Indeed, the humble logging system has become a valuable tool that is not only used by compliance officers, but which also provides broadcast engineers with a means to review and track down on-air incidents.

Logging, monitoring, and analysis tools which are designed for experienced broadcast engineers must deliver the same high level of service quality to mobile devices usually expected for primary screens, hybrid set-top boxes and smart TVs.

Having a unified system for monitoring compliance and identifying issues across all traditional and OTT playouts, such as those we have developed at Mediaproxy, is critical in reigning in a complexity both now and into the future. □



OTT Executive Magazine is accepting contributed pieces for our upcoming Summer issue. Please contact Nichole Janowsky for more information: njanowsky@ottexec.com.

Feature Styles:

Case Studies: An example of actual OTT deployments. May include lessons learned, best practices and pitfalls to avoid.

Trends & Analysis: A detailed research and analysis piece including supporting data. Articles typically include supporting charts and graphics.

Executive Q&A: An interview conducted by Trender Research in Q&A format.

Executive Insights: A short advice or opinion piece for an executive audience.

Best Practices: A detailed drill down on how to solve a specific OTT technical or operational challenge.

Defining the “Plus” in CDN

Interview by Kurt Michel with Mike Palackdharry, Limelight Network’s Senior Vice President, Strategic Solutions

Kurt Michel recently connected with Mike Palackdharry, SVP, Strategic Solutions at Limelight Networks to chat about how Limelight Networks is helping to transform the way customers can view live streaming.

Kurt: Limelight has been a key provider in our industry since 2001, initially as a CDN, and then adding value-added services as the need for them arose. Can you provide some perspective on the last few years – how the industry is changing, how you are responding, and amidst this change, what are the core elements of a successful OTT platform?

Mike: Consumer viewing habits have shifted significantly over the years. Online video viewership as well as consumer expectations for a broadcast-quality online viewing experience continue to grow. Viewers are no longer satisfied to just have the ability to watch programs on their own schedule. They expect high-quality video that plays reliably without rebuffering. In fact, in our latest State of Online Video 2018 report, global viewers said they would only let an online video rebuffer 2.2 times before they stop watching, down from 2.7 times two years earlier.

Limelight has invested in deploying its own global private network that connects our more than 80 global delivery locations. Limelight’s private network bypasses typical internet bottlenecks and provides a more secure environment for delivering video. We have also continued to expand the reach and

capacity of our CDN to help our customers to easily reach massive global audiences and have direct peering relationships with almost 1,000 ISP and last-mile providers to reduce the number of hops that video needs to travel to reach viewers. In addition, we have optimized our software to deliver online video with the highest possible quality and the guaranteed lowest video rebuffer rates.

As streaming services become more prevalent and move to live broadcasts and OTT multi-player gaming, content providers understand the need to get content as close to the user as possible. The next generation OTT battlefield will move from cloud computing to edge computing. One of the many benefits of the Limelight and Ericsson partnership is that it positions Limelight and Ericsson Edge Gravity for the launch of 5G networks and technologies. Together, Limelight and Edge Gravity will have the most comprehensive and advanced content delivery capabilities coupled with a landscape-changing edge platform for operators, content providers and application providers alike.

Kurt: Does device proliferation (types and software versions) continue to be a significant issue for you and your customers?

Mike: The number and different types of devices being used to watch online video continues to create challenges for OTT providers. Viewers are watching from a variety of devices such as smartphones, tablets, set-top boxes, gaming consoles, and



Mike Palackdharry is the Senior Vice President, Strategic Solutions at Limelight Networks. Mike has more than 30 years of senior executive experience focused on B2B business transformation and acceleration.

He joined Limelight from Aquire, Inc., where as President and CEO, he successfully re-imagined and rebuilt the company and greatly increased revenue before the successful sale of the company. In addition, he was President of Nationwide Energy Partners where he doubled the size of the company in just three years. Prior to that, Mike was SVP and GM for Convergys Corporation when he led the global telecommunications practice.

streaming devices. Supporting delivery to multiple devices is no longer a “should I?” it’s a “must do.” This means supporting multiple different streaming formats including HLS, MPEG-DASH, MSS, and more. In addition, content needs to be delivered in different resolutions and bitrates to accommodate viewers with different bandwidth and screen sizes. Encoding and storing all of these different combinations adds additional cost and complexity to the workflow. To help simplify the content creation and management process, Limelight offers just-in-time video packaging for both live and on-demand content. Limelight MMD-Live and MMD-OD automatically converts live and on-demand video content to the correct format, resolution, and bitrate as it is requested by viewers. So, rather than creating and storing all of the possible combinations, video is automatically packaged in the correct format for the device that is requesting it and is sent to the viewer over Limelight’s high capacity private network. This simplifies the process for delivering high-quality video to any device.

Kurt: Streaming Video has become ubiquitous. Entertainment, Enterprises, Schools, Municipalities, Retail, etc. Do Limelight’s services/solutions fit particularly well for any particular segment(s), and if so, how?

Mike: Limelight has a range of video



delivery solutions that help organizations of any size or workflow easily manage and deliver live and on-demand video. At the high end, Limelight's massive scale and capacity is able to handle the largest live events and deliver VOD content for the largest OTT providers. For smaller SMB organizations such as schools, municipalities, startup OTT services, etc., Limelight has integrated an Online Video Platform (OVP) that simplifies the process of managing, publishing, and even monetizing video libraries. And because Limelight's OVP is fully integrated with our CDN, we can both manage and deliver video content, simplifying the process with a best-of-breed single vendor integrated solution.

Limelight is squarely focused on video streaming and delivering the real-time experience, both of which differentiate us from our competitors. We've invested heavily in ensuring a device-agnostic, real-time experience independent of global location. The Ericsson Edge Gravity partnership will accelerate our capabilities and push our streaming capabilities even closer to the user.

Kurt: This is a 2-part question: Our industry has always had "the next big problem" to tackle in order to be successful. What do you think is "the next big problem" that the industry must tackle? How is Limelight committed to helping solve this problem?

Mike: Limelight is committed to delivering

continuous improvement in live broadcast and undetectable latency to improve the user experience around the globe in multiple verticals. Live video content is becoming increasingly popular online. Whether it's live linear streaming of traditional broadcast networks by MVPDs, major live sporting events, or newer types of content such as streaming of video gamers playing online, the amount of live content available online is growing rapidly. However, the inherent delays of 30 seconds or more for most live online streaming has impeded the adoption of live streaming. Sports fans don't want to learn about a big play from social media before they see it online. Reducing the latency of live streaming is becoming "the next big problem" that needs to be tackled for live streaming to replace broadcast television.

Limelight offers a range of low-latency live streaming solutions and edge capabilities that can reduce latency to less than one second. Limelight Realtime Streaming offers sub-second streaming to viewers anywhere in the world using standard web browsers. It also offers integrated data streaming along with video, which opens up a host of new interactive workflows. Now, live sports streams can include realtime statistics about your fantasy team or include integrated in-event sports betting opportunities on the same screen. Live auctions can include participants anywhere in the world who are

making bids on their computers or phones in real time. And online video gamers can play against each other and watch their favorite gamers in real time. These interactive online experiences are not possible with broadcast and will fundamentally change how people watch live events.

Kurt: Last fall, you announced an agreement with Ericsson Edge Gravity (nee Ericsson UDN). Can you describe the nature of that agreement, and some of your initial results?

Mike: Ericsson Edge Gravity and Limelight Networks embarked on a unique and industry changing partnership in October of 2018. The partnership combines Limelight's industry leading CDN technology and one of the world's largest TCPIP networks with Ericsson's incredible network presence, technology stack and operator footprint to transform how content is delivered and edge platforms are defined. The partnership will enable more than 210 global points of presence, over 1,000 last mile connections, a dedicated private backbone and unparalleled edge compute and application capabilities. We will truly redefine how operators and content providers think about content delivery. Although early in the partnership, we're well on our way in delivering these new capabilities to several of the world's largest operators and content providers. 2019 will be an exciting year for the partnership. □

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More information: info@ottexec.com

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The State of the OTT Business: How 5G and 4K Mobile Devices Change the Landscape

By: Mark Donnigan

This year at the Consumer Electronics Show in Las Vegas, attendees witnessed 8K and 5G demonstrations that rivalled even the most rapturous VR/AR showcases. With literally every major TV vendor announcing 8K TV displays, I began to reflect on the state of the OTT business beginning with consumer consumption patterns and their increasing quality expectations. The conclusion I reached is that the landscape is set to change, and here's why.

8K won't be a significant technology driver for TV sales until 2022 or later, but 8K will drive ubiquitous 4K across all devices including high end mobile phones, as the consumer will perceive 4K to be the new HD. Though 4K entertainment content will continue to be limited, video capture devices will all support 4K, which means UGC could be the largest source for 4K content over the next 12-18 months. Increased display capabilities, combined with an overall increase in video consumption, will make video the primary 5G driver for consumer applications. Video services that fail to super-serve their users will face decreasing subscriber counts, high churn,

falling ARPUs, and a weakening commercial environment. The HEVC advanced video codec, supported on 78% of iOS and 57% of Android devices connected to the network, is the best way to meet the quality expectations of the consumer while providing bandwidth relief for the network.

Change is coming, thanks to OLED displays, 4K, and HDR.

The first proof point that change is coming is that consumers are increasingly walking around with beautiful OLED-driven 4K capable devices in their pockets, such as the iPhone X, XS, Samsung Galaxy S9, and - fresh off MWC Barcelona - the Sony Xperia 1. These devices can reproduce HDR and capture 4K with amazing quality. Regardless of the human eye's resolution limits, it's hard to argue that the quality is awesome and consumers can tell the difference, even on a 6.5 inch diagonal screen.

So what does this mean for an OTT service offering? After all, there is still very little 4K native content available, right? This is true. But what it means is that the service that best matches the capability of the user's



Mark Donnigan is Vice President of Marketing for Beamr, a video encoding technology software company. Mark has been a part of building several trailblazing companies in the video industry, including VUDU. He's

held board positions with the CEA; and actively participates in industry consortiums, including UltraViolet and the SVA. Mark travels and speaks widely on the future of entertainment services and video technology around the world. Mark is also the cohost of The Video Insiders podcast

screen with the quality of the video they distribute will stand out. And in the era of consumer churn, make no mistake, standing out is going to become a corporate directive.

We can debate the merits of sending higher resolution to a small screen, but as an industry, we've been here before. It was less than five years ago that 720p was perfectly adequate for a mobile device. Yet, marketing departments invested heavily to convince consumers that 1080p was in fact "real HD." And, even though the bits/pixel were lower than 720p, and thus the absolute quality was reduced, 1080p became a requirement.

If you are being asked for a technical differentiator, I'd submit that the easiest and quickest one you can make immediately is to upgrade your entire mobile ABR rendition ladder to include 1080p, and not at quality-crushing bitrates. This will of course require a rethinking of the old mobile bitrate ABR ladder that is still found in way too many workflows, and an advanced codec that can meet the quality/bitrate savings thresholds that are rising as traffic volumes are increasing.

We can no longer assume that the customer "won't see the difference" between a high quality encode and low quality encode on mobile. In fact, we should assume that the consumer now has a device that is capable of displaying quality that may rival their 5-7 year old TV set with contrast, color clarity, and resolution.

5G and mobile first entertainment services will shuffle the video landscape.





Video providers can no longer stand by waiting for content to drive technology.

The second proof point of impending change is what will happen when the convergence of faster, more stable broadband, powered by 5G, connects with the consumers' ability to reliably capture and display 4K (and eventually 8K) on the phone. Even today with LTE, in most markets, a viewer can receive reliable bandwidth to stream high quality 1080p over the radio antennae. But high-speed mobile networks powered by 5G are positioned to unleash a tsunami of video traffic on the network like we've never seen before.

Service providers who are building their technology stacks to take advantage of this bandwidth windfall will be in a prime position to deliver a measurably better experience to the consumer. This position will benefit them in accelerated customer acquisition numbers, reduced churn, and higher ARPUs, as consumers will be able to clearly differentiate the quality as being better.

The hoopla around 5G that is coming from mobile operators should be taken seriously, not only for the way 5G will enable video distributors to delight their users with better quality and higher resolution streams, but also because these same carriers will use 5G to launch competitive video offers that should not be brushed away.

To amplify the connection between 5G and video services, T-Mobile spoke at a Citi investor conference in Las Vegas the week of CES, and Mike Sievert, President and COO of T-Mobile commented, "Broadband and video go hand in hand..." Sievert went on to comment that the opportunity for a video service definitely exists before T-Mobile's 5G broadband service is fully launched.

For traditional service providers who are reallocating pricing inside the bundle from video services to broadband, there is a cautionary flag here. With a T-Mobile or other large mobile operator offering cost effective, high performance Internet access courtesy of 5G, combined with the right set of direct or third-party video partnerships, this could be a bigger threat than the myriad of OTT service offerings that are set to launch this year.

This all means that video providers can no longer stand by waiting for content to drive the adoption and implementation of next generation video technologies, specifically HEVC. The chicken and the egg problem is about to be cracked open by T-Mobile, Quibi, and others, who are going to bring to market mobile-first video offers centered on HEVC because they know their customers' device can support a better codec which will allow them to transmit a better experience at higher quality, by matching the video to the capabilities of the screen (4K, HDR).

A codec war, this is not.

Painting technology transitions as a war between the prevalent standard and emerging or next-generation ones makes for catchy headlines, but it rarely describes what is really occurring. Thus, it's time to move beyond the codec war analogy, and recognize that video services are now in the most competitive environment ever—where the surest path to success is to move beyond H.264 to HEVC. There are more than 2 billion HEVC devices in the field today and the time is now to up-level the quality of experience that we as an industry are delivering to our consumers.

It is completely reasonable to ask what support is available for HEVC across all

video streaming playback environments, and here's a summary. Starting with in-home playback, if your customers have purchased a TV, game console, Roku box or Apple TV in the last 3 to 4 years, you can be nearly guaranteed that it supports HEVC without any need for additional licensing or a player upgrade. HEVC is now resident in almost every SoC (system-on-a-chip) that goes into any mid- to high-end CE video device. Since 2015, industry reports show this group of products numbers 400 million. The website caniuse.com reports that every UHD TV manufactured after 2014 supports HEVC natively.

Regarding mobile device support for HEVC, most operators today could cover up to 75% of their users with HEVC alone. ScientiaMobile, who maintains network device access profiles by receiving data from the largest wireless operators in the world, reports that a whopping 78% of all iOS smartphone requests come from devices that support hardware-accelerated HEVC decoding. And 57% of Android smartphone requests are from devices that support HEVC decoding.

The trends we've examined clearly show an ever more demanding consumer who wants content that shows off the full capabilities of their viewing device. But this same user is now consuming more content, further congesting the network; a fact that is colliding with a shift from managed services to unmanaged/OTT video distribution. And while this is creating additional internal technical tension for service operators already facing technical shifts and business model fracturing, some amazingly continue status quo strategies—even while new entrants are launching services that give the consumer more for less.

Will disruption and opportunity come from 5G and better display technologies, or will it be from something that has yet to even emerge? We don't really know. But there is no doubt that the landscape for video technology and business models is shifting, and the only question is where you'll be when the shifts settle down. "Stay the course" is probably not a viable option for today's video provider. □

OTT Evolution from an OVP Perspective

Interview by Nichole Janowsky with Gideon Gilboa, SVP of Product and Marketing, Kaltura

Nichole sits down with Kaltura's Gideon Gilboa for a candid interview regarding the evolution of OTT.

Nichole: How is the Online Video Platform (OVP) market evolving? What are the key customer and industry drivers today?

Gideon: In the past decade OTT has evolved from being a side dish or a complimentary offering to broadcast TV to the main dish – a replacement for broadcast TV. Pay TV service providers and media companies are replacing traditional broadcast TV distribution with OTT to remain relevant to their consumers. From a technology point of view, the platforms that are delivering OTT also needed to evolve. To replace traditional TV, neither OTT nor OVP were good enough. They weren't "pay TV grade." The platforms required must combine the best of pay TV—scalability, reliability, customization, and security with the best of OTT interactivity, agility, multi-screen and personalization. At Kaltura, we refer to this new grade of platform "Cloud TV". We believe that for any online video platform to flourish in the future, they must become Cloud TV grade.

Nichole: What are the key business

challenges your customers are facing, and how are you helping to address them?

Gideon: Our customers are facing two primary challenges:

- The need to launch a scalable cloud TV service (bringing the best of pay TV and OTT together) that is revenue-generating and can become a significant business contributor in the future.
- The ability to differentiate their service in a highly crowded marketplace where the typical consumer household may have 2-3 OTT services.

To solve the first challenge, we've evolved our online video platform over the past few years to become a Cloud TV platform via both acquisitions and organic development. For example, Kaltura's TV Platform offers a 99.995% availability SLA which means the platform can't be down for more than two minutes per month. This is required to assure that pay TV operators and media companies can rely on their service as a key part of their business strategy and have a stable and scalable platform.



Gideon Gilboa is the Senior Vice President of Product and Marketing for Media & Telecom at Kaltura. He spent the past 17 years on the product and marketing side of the video infrastructure technology business.

Prior to joining Kaltura, at NDS and later at Cisco, he held various research, product marketing, product strategy and product management leadership positions. Throughout his career Gideon played a key role in bringing new video products to market including the first DVR, DRM, addressable advertising and some of the first OTT systems.

With regards to differentiation, we strongly believe the basis for differentiation on the technology side is data. Data is the basis for our Targeted TV solution that brings data into every aspect of the platform and utilizes it to create targeted experiences that increase engagement, retention and monetization.

Nichole: What do you see as the most significant technical barrier(s) facing continued online video growth? What can you do to mitigate?



To succeed in today's environment, Kaltura believes the platform needs to become "Cloud TV" grade.



Kaltura offers a complete cloud TV service.

Gideon: Today, broadcast TV delivers live video to mass audiences in a much more scalable and cost-effective way. The Internet wasn't designed for broadcast and there is work to be done to make live video streaming both scalable and economically viable. At Kaltura we spend a lot of effort on our player and on analyzing low level QoE information to adjust the player to deliver the most optimized video experience. We believe data plays an important role here as well.

Nichole: On your website, you identify four different video markets – Business, Education, Cloud TV, and PaaS. Could you provide a high-level view of how your offerings to these markets differ? Technical? Packaging/Business Model?

Gideon: Kaltura's mission is to power any video experience for any organization. We do that today for many industries with industry-specific solutions and cross-industry solutions for any use case: media and entertainment, education, enterprise; for human capital management, communication and collaboration, sales, marketing and customer service.

Our video cloud includes a common PaaS layer that exposes APIs in areas such as ingest, transcoding, analytics, monetization, engagement and more. This is used across all verticals and use cases we serve. On top of that we build industry and segment-specific Video SaaS products. For example, our cloud TV platform is designed for media and telco customers. In Media and Telecom specifically, we typically sell a complete cloud TV service and know how to

provide the professional services around it to integrate and customize the platform based on the specific needs of that customer.

We also put a lot of emphasis on our partner ecosystem. We built the PaaS and SaaS layers to be open from the ground up and enable integrations with multiple ecosystem partners. We have over 140 technology partners integrated with our platforms today and there are many more developers who just use the open source portions of the PaaS layer.

Nichole: What do you see ahead in the online video space that has either the potential to create more disruption, or the ability to reduce the disruption and bring the industry closer to an equilibrium, or "new normal?"

Gideon: In some ways we think disruption in this industry HAS become the "new normal." The streaming wars are still largely unsettled, and the business strategies are continuing to change. For example, not so long ago, people thought that SVOD with an "all you can eat" subscription was the new normal; we see folks like Netflix who championed this approach, testing differentiated pricing per subscriber and talking about an ad-based model. The point is, it will take some time before things settle, and those entering this market need to take this into account. If video providers choose a platform that's not agile and can't grow and adapt as your business needs change, they are likely to find themselves stuck. The partnership between the cloud TV service provider and their technology vendors is critical in order to stay on top of things in these evolving times.

Nichole: How is the proliferation of OTT viewing devices (TVs, STBs, Dongles, Phones, Tablets, etc.) shaping consumer decisions on OTT service selection, content discovery, and the overall user experience?

Gideon: One thing is clear; there are more options than ever before for consumers to access OTT services via the big screen. This is important because its part of the evolution we mentioned above of OTT services replacing TV. Take for example Android TV and how it evolved over the last couple of years with the Operator Tier offering. TV service providers can now create a branded experience on the big screen for consumers in a quick, cost effective manner, unlocking all the functionality platforms that OVPs like Kaltura can offer to this application: personalization, advanced content discovery, multi-screen viewings, etc. At the same time, Android TV keeps an open experience for the user with access to all of the Google services. So what we get is a new type of TV offering: branded, feature rich, big screen quality and scale. Everyone wins.

Nichole: It sounds like all this innovation and evolution is good for the viewers – and those providers who can align themselves properly to OTT's "new normal." Thanks for speaking with us. □

Handy Checklist for Ensuring User Experience When Delivering Video Streams at Large Scale

By: Philippe Mouawad

“By 2019, 80 percent of the world’s internet traffic will be video” says Cisco.¹

Video is already a critical media for business and its importance will keep growing. But every additional second in video start or lag while playing increases the risk of abandonment on your website. Not to mention the potential bad buzz that would result from it.

Ensuring video performance is a major challenge due to several factors, the most important ones being:

- The number of third parties involved:

- Your servers
- Your encoding software delivering the stream formats
- The Content Delivery Network (CDN) caching your content chunks and manifests
- The telecom operator network your data is crossing
- The Digital Rights Management (DRM) servers delivering the keys for your protected content
- And finally the playing device of your customer

- The network bandwidth consumed which can be huge

- The location of your customers particularly for world-wide events

- The unknown potential traffic you need to anticipate

- When hosting major events, the potential unexpected peak traffic from a competitor experiencing serious performance problems. This can be an unexpected opportunity to win new customers if you correctly handle the load or a new “snowball effect” for the next streaming actor.

For the end customer, problems can manifest themselves in at least three ways:

1. Initial buffer fill (which is the time it takes for your video to start playing), the shorter your video is, the faster it should start. As a customer you would see the throbber appear.

2. Lag time, which is the time for which the video pauses waiting for the next chunks to come. Again, the dreaded throbber would appear.



Philippe Mouawad is an Architect and technical expert for Ubik-Ingenierie where he leads (among other things) the development of UbikLoadPack a set of Commercial Plugins for JMeter allowing to load test video streaming protocols like MPEG-DASH, Http Live Streaming (HLS), HSS, HDS, and other technologies like ERP applications, GWT, JavaSerialization, and Flex. Since 2011, Philippe Mouawad is a developer, committer and member of JMeter (the Open Source reference for Load Testing) Project Management Committee at the Apache Software Foundation. He is also the co-author of the book “Master JMeter : from load testing to DevOps.”

3. Delay in streaming, as a customer, you would be watching your favorite sport event in the past. You can guess the future dissatisfaction of your subscribers.

To ensure that your content is distributed under the best possible conditions, you should anticipate and run load tests on your infrastructure so that you can fine tune, add and optimize software layers (caching, CDN), and know your users’ future experience before they let you know how bad it is.

To ensure your load tests are useful, here are some hints that will help you succeed in your testing:

- Ensure you don’t test the cache, which makes you think everything is running smoothly while it’s not.

- Use many video streams: your users will surely watch different movies or ads, you need to reflect that in your tests.

- Vary bandwidth: your users don’t have the same network bandwidth, particularly mobile users. Vary the bandwidth available to your virtual users to simulate the different networks and know the lags per bandwidth.

- Vary source locations: your users will probably come from different locations in your country or worldwide, ensure you use different source locations. The cloud is your friend.



- Check all the streaming formats you deliver.

-To ensure your users have the best experience, you know that you have to deliver at least two or three of the most popular formats to target the largest audience (Apple HLS, MPEG-DASH, HSS).

-Ensure you test all these formats under load. This can be tedious, but fortunately, there are tools that can help you.

-Vary the bitrates requested by players to know what quality you can deliver under good conditions

-Check the freshness of what you deliver! Have you heard this summer about this OTT service which delivered streaming football world cup matches with two minutes delay?

- Reproduce the players' behavior. Load testing streaming servers realistically is not easy. A player does many things at the same time that can impact user experience.

-Download video streams. This will occur on startup and while the player is playing to ensure video keeps playing smoothly with no lag. Ensure you reproduce live streaming player behavior correctly, handling live stream is more complex than VOD with a lot of

edge cases. Manual simulation of such streams is complex, time-consuming and error-prone.

-Download audio streams that are delivered in parallel with video. The streaming video includes streaming an additional audio stream which doubles the number of requests to your servers

-Contact DRM servers to check rights. These can be third parties for which you would define SLAs, but you can also host them. In the latter case, you'll need to ensure they correctly handle the load.

-Play stream that involves decoding. This is more a client (player) issue so it is less critical, but to ensure you provide the best experience, use popular and fast codecs to encode your video.

- Collect the critical metrics; load testing metrics differ from video streaming metrics. Besides the usual metrics, like connect and download time, you should track the following in order to understand user experience:

- Initial buffer time
- Lag times
- Lag ratio
- Cache hit/miss ratio from potential CDN
- Age of the chunks

- Monitor every stack involved in delivering the content to understand where the issue comes from and fix it.

- Test often and automate as much as you can. Have you heard about the "shift left" approach which aims at testing as soon as possible? This approach ensures that every new version of your software/deployment infrastructure is tested earlier in the building process, allowing you to fix at lower cost, issues that you would be facing in production. Tools like Jenkins CI and cloud deployment can help you achieve your goals.

Solutions, such as UbikLoadPack, provide an OOTB solution which answers almost all requirements of video streaming servers load testing. □

Reference:

1. <http://www.cisco.com/c/en/us/solutions/collateral/service-provider/visual-networking-index-vni/mobile-white-paper-c11-520862.html>



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7 Predictions for Online Video in 2019

By: Jim O'Neill

Remember when streaming was the supplement to traditional broadcast and pay TV? When live streaming a major event — like the Super Bowl, the World Cup or the Olympics — would “break the Internet?”

A lot has changed in a few short years. And even David Bowie knew that ch-ch-changes meant we were going to need new ways to go forward. Well, look how far we’ve come.

Recently I’ve seen articles proclaiming, “TV isn’t dead.” Maybe not, but traditional TV is struggling. U.K. telecom regulator Ofcom, for example, found U.K. viewers consume 5.1 hours of audiovisual content daily, but only 71% is from broadcast. The other 29% is OTT. Among the 16-34 demo, broadcast share is 46% (about 35% of the video they consume is NOT on a TV set).

So, describing the health of *traditional* television viewing as “robust” is a bit of disinformation, like telling the kids the goldfish isn’t dead, it’s just sleeping. Or saying that as viewers age, they’ll return to technology they’ve already discarded. Just ask any newspaper publisher how that worked out in the age of the Internet.

With that business out of the way, here’s what I see ahead in 2019:

1. Say hello to the “polycLOUD”

While there is growing discussion here in the pages of *OTT Executive Magazine* about

the concept of device integration, content producers and distributors need to consider *cloud* integration as well. With the increasing role of AI, “polycLOUD” becomes common vernacular. This concept acknowledges that Microsoft, Amazon and Google, for example, offer similar core services -- but each has its own special expertise. Using multiple vendors will allow you to develop a more customized solution that uses the strengths of each cloud, without making any sacrifices.

2. More M&A in Media & Entertainment

We’re not done with M&E M&A. Consolidation makes it clear that control of your content supply chain is crucial. On the horizon:

—The Justice Department swings and misses in its “re-effort” to disrupt the AT&T/Time Warner deal;

—Hulu do-si-dos and changes partners as Comcast, Disney and AT&T find it impossible to come to mutual agreement on how the service evolves;

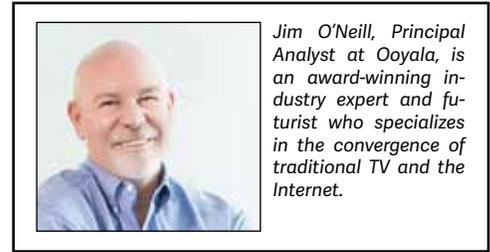
—AMC, Lionsgate, CBS, and Univision — among others — are potential targets.

3. Amazon breaks up the Google/Facebook digital advertising duopoly

Google and Facebook controlled 58% of the ad market in 2018; Amazon just 4%. In 2019, Amazon will leverage its accumulated purchasing and browsing data, along with consumer credit card data, especially as Facebook’s audience skews older. Look for a double-digit share by 2020.

4. Artificial Intelligence Grows Up

Huge spending on AI by the industry’s biggest players means we’ll see better management of data, allowing companies to better utilize that data in advertising, content delivery, content development and more. Better data



Jim O'Neill, Principal Analyst at Ooyala, is an award-winning industry expert and futurist who specializes in the convergence of traditional TV and the Internet.

mining produces *true* business insights and opportunities.

5. Are OTT Services at The Saturation Point? Not Even Close

Oddly, pundits like to compare OTT to traditional TV, positing that the bumper crop of OTT services has saturated the market, creating insurmountable challenges for new entrants. That’s absurd. OTT *is not* traditional TV; it thrives on consumer choice, random interaction and its own ability to iterate and respond to the changing conditions of new TV. AI will help niche producers “mine” audiences globally, enabling smarter solutions for distributors and consumers. In 2019, Netflix and Amazon will continue to grow, while audiences supplement with a revolving carousel of services.

6. Sports builds a new arena for larger audiences — the app

Every sports team, league and conference will go OTT because that’s where their audience is. With the legalization of sports betting in the U.S., sports will accelerate its move online to appease the 64% of 25- to 34-year-old North American men expected to dabble in sports betting.

7. 5G is winning the race before it — officially — even begins

The next generation of cord cutters is looming, this time wired broadband, as 5G quickly ramps up to offer speeds and latency performance to rival fiber. About two dozen carriers are expected to launch 5G in 2019; another two dozen-plus are expected in 2020. 5G wins before the race even officially starts.

□



5G is winning the race before it even begins.

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