Cognizant
Broadcasting Perspectives
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Lights, Camera, Action!

Welcome to our inaugural issue of Broadcast Perspectives, our journal covering trends, practices, and points-of-view offered by our media and entertainment consultants and industry practitioners.

Each year at NAB, we reflect on the many changes that have occurred in our industry over the past year, and try to anticipate the inevitable changes that will occur in the next 12 months. The pace and magnitude of this change seems to increase each year. We are truly on the precipice of new business models and new ways of engaging consumers.

Our industry has been undergoing a digital transformation for the past 20 years. As we mastered the digitization of content, then realized the vision of digitally distributing content to any device, anytime, anywhere, we are now faced with finding new ways to monetize these digital experiences.

At Cognizant, we strive to provide our clients with a full suite of services, from strategic planning, roadmapping, agile execution, and operating technology platforms and even business processes. We have the privilege of working with many of the leading media and entertainment companies around the world. We are a trusted business partner who helps our clients Run Better, while they also strive to Run Different.

Broadcast Perspectives provides yet another opportunity to share ideas and collaborate with you. This issue contains some of our innovative thought leaders covering a variety of topics relevant to our media and entertainment colleagues.

- Matt Eaton examines the latest technology-driven media and entertainment industry trends, with a special focus on what these trends mean to your business.
- Diving a bit deeper into one critical aspect of disruption through technology, Jim Elayan and Abraham Thengungal seek to answer the question – Will the second wave of Online Video Distribution services drown U.S. Pay TV?
- David Ingham discusses the importance of understanding and monetizing the halo of data that surrounds each viewer and consumer; and then drills down into a specific predictive model, recently presented at MESA in London, that was applied to the 2016 Oscar nominations.
- We end the issue with a thought-provoking exploratory essay on bridging the cultural divide between Broadcast Engineering and IT, originally presented by Blake White at the PBS Tech Conference.

Enjoy our exploration of ideas, and let us know what you think.

Best wishes for a productive and profitable 2016,

Steven Pappas
Global Vice President, Cognizant Business Consulting
Information, Media and Entertainment Practice
Ultra-high-definition services are poised for greater adoption and drive customer engagement, especially among sports fans. Meanwhile, consumers are turning to “second screens” on their smartphones and other mobile devices to broaden the scope of their viewing experiences. Broadcasting companies are also focusing on content planning, discovery and production.

When looking at the growth prospects of the M&E industry for the next two years, most observers will notice developments in enabling technology that are driving the industry. They include: Direct-to-Consumer (D2C) initiatives such as Over-the-Top (OTT) services, higher resolution formats for presentation such as 4K/HDR/HFR and more sophisticated metadata/content discovery, supported on a foundation of IP end-to-end workflows and cloud-based storage and distribution. Accompanying these technological advances are equally important business and human concerns we are hearing among our client base:

“The big costs in production have moved from products to people.”

“4K is only addressing one use case of consuming content – in-home TV viewing.”

“What do audiences want to experience from 4K and will they pay?”

“A joined up view of the customer is the holy grail we will be chasing for the next few years.”

“Playout in the cloud is when, not if.”

“Hope is not a strategy.”

Is 4K/UHD/HFR/HDR the Next Game Changer?

4K resolution/Ultra-High Definition (UHD) services are in the early stages of adoption, but are viewed as emerging game changers that will drive future infrastructure upgrades and deepened customer engagement. Traditional broadcast infrastructures will struggle with the step change required. OTT providers have already started rolling out services. TV manufacturers will drive consumer demand.

Related developments and observations:

- Consumers are willingness to pay up to an additional $10 per month for UHD, but awareness was very low prior to demonstration, according to a Eutelsat consumer study.¹
Matthew Goldman, SVP of Ericsson said HDR+ will not be implemented before 2017 or 2018 and HFR at frame rates of 100/120Hz will not be implemented before 2020.¹

Amazon and Netflix have been offering 4K streams on various TV shows and movies since 2014.²

Netflix recommends a connection speed of 25 Mbps for viewing UHD content; however, in most U.S. states, less than 10% of homes achieve this connection speed today, according to Akamai.³

Netflix delivers audio playout in lower quality Dolby 5.1 only, not the high-res DTS Master Audio soundtrack.³

Some production companies are saying they are actively considering making changes in lighting and production in order to account for HDR content.

BT Sport (Europe) launched UHD packages in 2015.⁶

Rogers Communications of Canada announced it will air UHD broadcasts for selected MLB and NHL games and other sporting events, including some with HDR, in 2016.³

ESPN says it is technologically ready for UHD, with the Sports Center studio reportedly already being 4K-capable and some games now being shot using 4K equipment.⁸

Comcast, DirecTV and Dish Network have all made announcements regarding 4K-capable set top boxes, and Comcast is also planning for an HDR-capable set top box.⁹

TiVo Bolt, Roku 4 and Amazon Fire TV are all 4K-capable.¹⁰

Potential opportunities and considerations for your business:

- As with 3D, the move to UHD is primarily being driven by TV manufacturers looking to sell their next generation of sets.
- UHD cannot be ignored, especially for sport; UHD changes the way games are shot and directed, with much wider angles and slower panning.
- There is some support for increased frame rates, but it is not universal among broadcasters.
- UHD, HDR and the like require huge investments in cameras, infrastructure, editing, storage, playout and set-top box upgrades.
- The technology and know-how around 4K are still maturing.
- Businesses should proceed with caution. Do not underestimate the untapped demand for focusing instead on providing further high-quality HD content.
- Challenges in delivering UHD and 4K include lack of agreement on standards, the risk of hardware quickly becoming obsolete, the need for infrastructure that can consistently deliver the high data rates required and increased production costs.
Second Screens Become an Extended Viewing Medium

“TV Everywhere” has been developed as a collective strategy for broadcasters to enhance the traditional linear TV proposition by allowing some viewing to occur off the primary screen and onto second screens (including tablets, smartphones and other devices). Second-screen strategies should include a social component, allowing users to interact and turn the program into a “can’t miss” event.

Related developments and observations:

- According to Nielsen, 58% of viewers browse the Internet while watching video programming (March 2015).\(^{11}\)
- According to Nielsen, 53% of viewers like to keep up with shows so they can join the conversation on social media (March 2015).
- According to Nielsen, 49% of viewers watch live video programming content more if it has a social media tie-in (March 2015).
- AMC's Story Sync app has been a hit with viewers of The Walking Dead, Breaking Bad and The Killing, keeping them engaged with polls, trivia, quotes and flashbacks.\(^{12}\)
- Pretty Little Liars, airing on Freeform (formerly ABC Family), regularly reaches 2 million viewers per episode and ranks in the Nielsen Twitter TV Ratings top 10.\(^{13}\)
- American Idol, now in its farewell season, offers five different ways to vote: Online, via the FOX NOW app, by text, by phone and by Google Search.\(^{14}\)
- Virtual Reality, especially Oculus Rift, was a focus area at IBC 2015.
- Ericsson discussed at IBC 2015 how 5G is an enabler of 4K on mobile devices.

Potential opportunities and considerations for your business:

- Opportunities to develop second-screen apps to support live-event series, including stadium experiences and digital signage.
- Opportunities to augment live sports events through second-screen apps, providing additional player and game statistics.
- Opportunities related to the “Internet of Things,” where many different connected devices are likely to have screens.

Playing Catch-up with OTT

Consumers are increasingly preferring to watch content at a time of their convenience, on a platform of their choice. Linear and video-on-demand (VOD) supply chains continue to be managed separately at most broadcasters. In an increasingly crowded market, technology is the relatively easy part – the challenge is having a content proposition that people will pay for and can find. As OTT platforms are maturing, broadcasters are looking to use the technology to engage viewers better.

Related developments and observations:

- According to Nielsen, 64% say watching time-shifted programming better accommodates their schedules (March 2015).\(^{15}\)
- AT&T recently announced three new OTT services – DirecTV Now, DirecTV Mobile and DirecTV Preview – all of which would allow streaming without a satellite dish or set-top box.\(^{16}\)
- Pay TV operators are now stuck in an investment cycle trying to get the next-generation platforms out.
- We are seeing a shift to an apps-driven approach for set-top boxes, with apps increasingly targeted to niche markets (i.e., BBC iPlay for kids).
- Netflix is using metrics to track the effectiveness of suppliers – we can expect this to become more widespread in the industry.
- Amazon and Google are defining new standards for video players.
Potential opportunities and considerations for your business:

- We are past the first generation of OTT infrastructure and supply chain and are ready for a second pass with better integration, which will drive greater efficiencies.
- OTT platform, infrastructure, goals and success criteria look different for traditional broadcasters, which have to serve a traditional viewership vs. pure-play OTT entrants.
- There is an opportunity to investigate business model innovation and product innovation, such as Electronic Sell Through (where the viewer purchases the digital content).
- A common rights, metadata and content management view is needed across linear and non-linear platforms, but this does not necessarily mean implementing a monolithic single system.
- Incremental viewership gains from OTT can add to linear advertising packages.
- Consider buying new products and end-to-end offerings from third parties.

Growing Importance of Content Planning

As the OTT market matures, so too does the multi-platform content planning function. Many media organizations still have siloes for each platform, but they must adapt in order to more efficiently manage multiple platforms. Content planning needs to maximize the revenue and utilization of acquired rights. It calls for the convergence of operating models in a linear and non-linear fashion, making live and on-demand schedules work together.

Related developments and observations:

- The Entertainment Identifier Registry (EIDR) standard is gaining traction in the United States and internationally, now that cross-platform content is becoming part of the end-to-end content supply chain.
- Sky U.K. is investing in a central rights system outside the scheduling system and has centralized rights acquisition functions for sports and entertainment.
- Broadcast management systems vary in the degree to which they support VOD and, in turn, several specialist VOD scheduling and metadata solutions have sprung up (such as BeBanjo).

Potential opportunities and considerations for your business:

- Planning and scheduling of content across platforms needs to become more integrated, in order to better understand what’s on, where, and more importantly, how much it is worth.
- Traditional ways of valuing content are increasingly viewed as inefficient and do not take into account online and catch-up data; this results in missed opportunities related to capturing the full value of the customer and responding to changing customer behaviors.
- Valuation models for content are evolving to incorporate multiscreen and online viewing.
Get Content Discovery Right First

Recommendation engines play two roles: First, allowing the consumer to see what they want through personalization, and, second, allowing the broadcaster or service provider to promote what it wants the viewer to discover. As such, recommendation engines are as much a marketing tool as a practical guide for the consumer. However, several industry analysts are saying recommendations are not sophisticated enough and broadcasters should concentrate on content discovery for now.

Related developments and observations:

- Several recommendation vendors at IBC 2015 demonstrated conversational verbal search functionality (i.e., Siri or Amazon FireTV).
- In a survey conducted by Ericsson in 2015, HD-quality content tops the list of “TV Media Features Worth Paying For”; personalization does not feature in the top nine.\(^17\)
- Half of consumers who watch linear TV say they can’t find anything to watch.\(^18\)
- Interesting developments were evident at IBC 2015 in the area of sports metadata for content discovery, increasing user engagement and monetizing time shifted sports based on highlights.

Potential opportunities and considerations for your business:

- One wonders if the future of recommendation engines is to dynamically create personalized linear services?
- Compiling rich, structured, enhanced metadata to drive recommendations is complex and may be easier to buy from third parties.
- Production is a rich source of metadata that is often lost downstream.
- Recommendations may not be as useful as allowing users to discover and navigate a catalog of content (being able to find other films actors have appeared in, for example).

Increased Focus on Content Production

Broadcasters are adopting a strategy of acquiring content producers in both the United States and the United Kingdom. This is partly to reduce their dependency on advertising revenue and subscriptions, a strategy rewarded with share price growth, and partly to benefit from opportunities selling rights and formats internationally. By acquiring companies upstream, broadcasters are transforming into more vertically integrated media organizations. Streaming services such as those from Amazon and Netflix are also investing heavily in content.

Related developments and observations:

- Many recognizable media brands are content brands (i.e. Game of Thrones and Downton Abbey); some content brands have become bigger than the broadcaster’s own brand.
- Amazon Studios takes content submissions worldwide and develops selected projects, using audience feedback, into original series that air on their streaming services.\(^19\)
- Amazon paid $15 million for the rights to Woody Allen’s latest film (Feb. 2016).\(^20\)
- Netflix does not release its ratings information, but has generated lots of buzz with its own exclusive, original programming across multiple genres, including dramas (Orange is the New Black, Bloodline), docu-series (Making a Murderer) and re-boots (Fuller House, Gilmore Girls).
- Adam Crozier, ITV CEO: “As we look to 2016 and beyond we see further significant opportunities for growth across the company organically and through acquisitions and partnerships.”\(^21\)
- ITV acquired five U.S. producers between 2012 and 2014: Gurney Productions (Duck Dynasty), High Noon Entertainment (Cake Boss), Thinkfactory Media (Hatfields & McCosys), DiGa Vision (Teen Wolf) and Leftfield Entertainment Group (Pawn Stars, Real Housewives of New Jersey).\(^22\)
ITV acquired U.K. producers The Garden and Big Talk Productions in 2013, as well as U.K. producer Twofour Group and Netherlands producer Talpa (The Voice) in 2015.23

Potential opportunities and considerations for your business:

- Increased content production focus can protect against increasing rights-acquisition costs and create opportunities for international-rights sales and differentiation.

- High-quality content production is the heart of the industry and requires capabilities, skills and assets.

OTT and Sports are Driving Rights Hyperinflation

Traditional rights holders are challenged by telcos and new-age OTT entrants, which have deep pockets without the high fixed costs of pay TV operators. With greater flexibility for content spending and aggressive competitive bidding across territories, there is a risk of content-rights hyperinflation.

Related developments and observations:

- Netflix has acquired all streaming rights from Disney for all new releases once they leave theaters; Netflix is playing a long game moving away from the vast catalogs to more a curated content offering.24

- ESPN’s recent layoffs were, in part, due to rising rights costs.25

- BT Sport paid £900 million for exclusive rights to Champions League soccer over three seasons.

- In 2016, BT Sport and Sky will together spend more to televise one season of Premier League soccer than the BBC spends annually on all its hours of TV programming.26

- Amazon paid $250 million for three seasons of Top Gear.27

Potential opportunities and considerations for your business:

- Companies must optimize to ensure they get full value from rights purchased.

- Content rights pricing can be affected by the number of platforms.

- Telcos are investing in content to help stem broadband migration.

- Global OTT players have developed strong relationships with Hollywood.

- A strategy of rights acquisition at any cost – a “blank check” – could prove retrograde as the consumers are not willing to pay for the same content.

- Consumer insights are valuable and could be incorporated into deals and agreements.
Consumers Trust and Engage with User-Generated Content (UGC)

Media companies are finding new ways of integrating the audience into their programming by co-creating content in the form of images, blogs and videos to build brand loyalty. The steady rise of citizen journalism on social media is being leveraged heavily by websites like YouTube, Wiki and Flickr.

Related developments and observations:
- CNN recently overhauled its iReport, one of the earliest mainstream media citizen journalism products, now allowing Facebook, Twitter and Instagram users to submit stories using the #CNNiReport hashtag.
- BBC launched the “news gatherer” app, allowing citizen journalists to file stories directly from their phones.
- YouTube gamer PewDiePie, who publishes himself playing video games, makes $7.4 million a year and has more than 37.7 million subscribers; he has recently signed up to Disney-owned Makers Studio to distribute his content.
- Sites such as Twitch are increasingly popular among the gaming community, who consume live feeds from other gamers and gaming events.
- Youku Tudou, a Netflix-like Chinese company, plans to invest $1.6 billion in “web native” content (i.e., original material from viewers).

Potential opportunities and considerations for your business:
- World events and local news items could be augmented by local data feeds.
- Experimentation with YouTube-based channels.

Analytics Will Drive the Connected Consumer Experience

Many consumers already use social media in order to discover new content. A beneficial side effect of this process is the trail of digital footprints left behind as they interact with these services. As on-demand services become ever more important, social analytics will be essential to analyze what consumers are watching, downloading and discussing on their OTT devices.

Related developments and observations:
- By analyzing social media data, NBC found Chicago Fire viewers have a higher brand affinity for Jeep than Chevrolet.
- BBC is collecting data in real time on how content is being discovered, user journeys and user experiences.
- BBC’s Music Playlister app can remember songs heard on air and play them back on iTunes, Spotify or YouTube.
- BBC drives new registrations through voting on shows such as Strictly Come Dancing.

Potential opportunities and considerations for your business:
- Using data analytics across platforms as part of decision-making is a competitive advantage.
- It is important to start by asking the right questions and determining goals, before doing data mining on these types of data:
  - Consumer insights
  - Content valuation
  - Digital marketing
  - Consumer monetization
  - Capturing and retaining subscribers
- Analytics can be useful when determining how to reach audiences, protect relevant advertising and content; and create correlations that can be used for programming decisions.
- There is an opportunity to initiate new products that respond to customer insight.
- Lots of experimentation is happening in this space.
End-to-End IP Workflows are in Need of Standards

Our industry is about to go through one of its “hidden” technological transitions, meaning it will be less visible to the end viewers of our content, but very significant to broadcasters. One example of such a transition was when we went from analog tapes to files. Another relevant example for today’s transition is when we went from analog to SDI in our plants. However, standards are still being debated.

Related developments and observations:

- There are two standards competing for dominance in encapsulating the SDI stream in IP: Society for Motion Picture and Television Engineers (SMPTE) 2022 vs. IEEE Audio-Video Bridging (AVB). Most solutions (such as Axon) now support both.
- Not many end-to-end IP workflows are in production today.
- Some vendors are building gear that is inherently hybrid and will support SDI and IP together.
- BBC is approaching end-to-end IP workflows differently, by splitting up audio and video components so that they can follow different parallel processes.
- Others, like Suitcase TV, are adopting a frame-based approach to IP chunking (IBC 2015 award for remote vision mixer).
- IP Production Group (IPPG) is establishing open media standards.
- Remote Live Broadcast was a hot topic at IBC 2015. RLM removes the need for location-dependent equipment but needs video, audio and control signals distributed to studios.

Potential opportunities and considerations for your business:

- Benefits include lower investments in capital equipment and associated power consumption and HVAC (heating, ventilating and air conditioning) considerations.
- IP is a key enabler to 4K.
- Software-Defined Networks (SDN) allow for complex networks to be configured and changed with relatively simple tools; this means making graphical adjustments describing how you want your network to operate rather than command line operation of individual switches and routers.
- Standards still need to be finalized in the area of live production, especially around multi-signal timing.
Equipment manufacturers are developing solutions that are agnostic to SMPTE and SDI; it is likely that uncompressed streams will make sense within live environments (such as sports and news) and that compressed streams could be used in other parts of the facility.

There is an opportunity to explore low-cost, remote, live broadcasts in more detail based on production focus.

These advances will require changes in personnel skills and culture; there is a gap between the traditional engineering ethos of platforms built to last vs. the IT-centric view of platforms that are being designed to be resilient expecting that servers will fail.

Head in the Clouds

Broadcast operations needs to become more flexible in order to support new platforms and lower its fixed costs to allow for investment into new content and delivery mechanisms. One way of doing this is using the cloud with op-ex and unlimited storage/compute capacity to manage bursts.

Related developments and observations:
- Amazon Web Services (AWS) acquired Elemental for broadcast IP distribution.31
- Major projects are under way in Europe for cloud-based DVRs.
- BBC iPlayer is using transcoders in AWS to manage bursts.32
- Major studios are moving end-to-end content processing to the cloud.
- Imagine/Disney virtualized linear playout to private data center in 2015.33
- Netflix is using AWS for content processing and distribution.34

Potential opportunity for your business:
- Locating storage to compute in the cloud.
Footnotes


About the Authors

Matthew Eaton is Director of Consulting within Cognizant’s Information, Media and Entertainment business unit based in London. He has worked in the broadcast industry for the past 20 years as a management consultant, operational lead, and managing technical solutions delivery teams, providing a bridge between operations and technology. He works with clients to create strategic plans for IP operations and playout, to make right technology decisions for managing content, and to improve operational efficiency through process redesign. Matthew holds an international Executive M.B.A. from Ashridge Business School. He can be reached at matthew.eaton@cognizant.com.

Kim Lucin is a Senior Consultant within Cognizant’s Information, Media and Entertainment business unit based in New York. She has over eight years of experience in the media and entertainment industry and has developed extensive cross-platform expertise from working in Broadcast, Print and Digital newsrooms. Kim received an M.B.A. from NYU. She can be reached at Kimberly.Mineo@cognizant.com.
As video subscriptions decline amid the onslaught of over-the-top services, pay-TV providers need to experiment with new video delivery options and business models to attract more customers.

With the launch of online video distribution (OVD) services by several content providers, 2015 was a critical year for the U.S. pay-TV industry. Toward the latter half of 2014, HBO and CBS revealed their plans for launching standalone OVD services. Since these services no longer require a customer to subscribe to a TV package, the move has the potential to disrupt the traditional pay-TV business model. With major pay-TV providers losing video subscriptions, the industry is keenly awaiting the repercussions of this second wave of OVD services.

OVD services are not new. In 2011, the U.S. pay-TV market experienced the first wave of OVD, popularly known as over-the-top (OTT) services. Netflix, a popular subscription-based OTT service, has since surpassed Comcast, the largest pay-TV provider, in total number of video subscriptions. The trend continues in which pay-TV providers have lost customers due to the rising popularity and proliferation of on-demand video services (see Figure 1). Leichtman Research Group Inc. reported that 13 major pay-TV providers in the United States, constituting about 95% of the market, lost about 125,000 video subscribers in 2014 and 384,000 in 2015. Although these numbers are minute compared with the overall pay-TV subscription base of over 95 million, the decline indicates the need for pay-TV providers to reinvent themselves.

The popularity of subscription-based OVD services not only eats into the revenue of pay-TV companies, but also utilizes a large portion of the broadband infrastructure they provide to their customers. Statistics by Sandvine, a network management company, suggest that during peak hours, Netflix customers consume more than one-third of the total Internet traffic on fixed networks in North America. Availability of content in more bandwidth-consuming formats like 4K will further increase future traffic on these networks. The combination of low price points, wide choice of content and accessibility across different devices has carved out a new segment of video customers for these online aggregators.

Nielsen’s third-quarter 2015 Total Audience Report states that roughly 46% of U.S. households subscribe to streaming services such as Netflix, Hulu Plus or Amazon Prime.

Revenue loss for major pay-TV providers
during the past few years is mainly attributed to the following viewer categories:

- “Cord never.” These are viewers who have never subscribed to any pay-TV packages and have no plans to subscribe.
- “Cord cutter.” In this category are viewers who formerly subscribed to a pay-TV package but discontinued it due to the availability of other video services.
- “Cord shaver.” These viewers have shifted to a less-expensive pay-TV subscription package.

Advantages of Pay-TV Service over OVD Subscription

With a host of content providers such as HBO, CBS and many others launching standalone subscription-based services, customers will have an even wider array of OVD options from which to choose. Rather than opting for a conventional TV package, customers will have the freedom to choose a specific set of “channels” via an array of OVD services. Despite increasing OVD momentum, pay-TV providers still have a definitive edge in the following categories:

- **Content availability.** Pay-TV subscriptions give the customer a wide array of channels from which to choose, catering to a variety of household tastes compared to an OVD service. In fact, our forthcoming Communication Services Customer Experience Study found only 23% of OVD subscribers are happy not having a TV subscription. Missing their favorite shows and programs (30%) and lack of content availability (31%) are the major reasons for dissatisfaction among non-pay-TV customers. OVD services by content providers typically have limited content offerings since they mostly host in-house produced titles. Some content providers also have restrictions on the content they can feature on their OVD services and timing of its availability. For example, CBS All Access cannot show its Thursday and Sunday NFL games in some markets due to contractual obligations.

OVD services by content providers have sometimes suffered from lackluster adoption. For instance, HBO Nordic, launched in 2012 as a standalone service, counts 68,000 subscriptions compared with Netflix’s 864,000 subscriptions in Sweden as per the Mediamätning i Skandinavien (MMS) consumer survey.³
This data suggests that customers value choice of content in their OVD services. In spite of the launch of Netflix and HBO Nordic in the same year, Swedish pay-TV subscriptions decreased by only 36,000 (less than 1%) in 2013. So it may be that new services will also have a difficult time gaining customer loyalty in the over-crowded U.S. video entertainment space.

- **Cost of subscriptions.** Monthly pricing for OVD services by content providers will be a crucial factor in determining customer acceptance. Subscription prices for these services will need to be significantly lower than the price for pay TV for it to make economic sense to consumers. HBO, which is among the most popular content providers to join this wave, launched its service HBO Now at $14.99 per month. Most subscribers pay between $10 and $18 to their pay-TV provider for adding HBO to its existing package. Moreover, current pay-TV subscribers of HBO can view on-demand content from a multitude of devices using the free HBO Go app. Hence, an existing pay-TV subscriber is quite unlikely to switch to HBO Now service.

Since several pay-TV providers also own broadband infrastructure, customers can save on their net monthly payments by bundling TV and Internet services. Considering a hypothetical situation where all content providers launch their own OVD services, opting for a standalone Internet package in addition to a variety of OVD subscriptions would be more expensive than purchasing bundled TV and Internet service.

Figure 2 compares less-expensive bundled services with standalone Internet packages purchased in addition to five OVD subscriptions (at an average price of $10 per month). In all the cases, it is cheaper to bundle TV and Internet services. Hence, from a customer’s point of view, subscribing to multiple OVD subscriptions will not be economical. The added complication of tracking and paying different bills and a non-uniform user experience for each of these OVD services are additional drawbacks.
For content providers, the risk of cannibalizing revenue from pay-TV operators by launching standalone OVD services is a major concern since customers are unlikely to pay for both services. WWE network, for example, launched a standalone streaming service in early 2014 at $9.99 per month with a six-month commitment clause. Reacting to this move, pay-TV operators such as Dish Network and DirecTV stopped featuring the sports entertainment producer’s pay-per-view programs, which had an adverse effect on its Q3 2014 revenues. WWE experimented with its pricing plan to offset this loss, by launching a $12.99 “cancel any time” plan in August 2014, which resulted in a paltry 23,000 new customers in Q3 2014. That pricing plan was replaced by a simplified, no-commitment $9.99 monthly subscription. With 1.22 million subscribers in Q4 2015, the service has reported a dip of roughly 100,000 viewers compared to last quarter, probably marking stagnation. Hence, revenue from standalone services should more than offset the loss of revenue from pay-TV operators, enabling content providers to remain profitable and cover the cost of these new services.

**Quality of linear video content viewing.** OVD services have struggled to maintain their quality of service since they do not have control over the network on which their live video content is delivered to the consumer. Roughly 17% of U.S. customers re-opted for paid TV services in the last two years, according to our upcoming Communication Services Customer Experience Study 2015. Roughly 10% of customers cited poor video quality and service disruption while using OTT services as one of the main reasons for dissatisfaction.

Common complaints from customers of linear content on OVD services include technical glitches, video lag compared to conventional pay-TV transmission and non-availability of content. For example, HBO Go crashed during season five premiere of Game of Thrones due to high customer viewership. WatchESPN, one of the prominent customers of the white-label online streaming service from MLB Advanced Media, received numerous customer complaints about inability to access the U.S.-Germany soccer match during FIFA 2014. During the match, WatchESPN reportedly had 1.7 million concurrent users. Sling TV had also reported multiple crashes in the previous year while featuring live events. This suggests the Internet may not currently be the best medium for delivery of live content.

Content delivery networks (CDN), which cache video content closer to the customer, work well for time-shifted video content. In the future, if stricter net neutrality rules are implemented, service quality of OVD services could improve. However, it is safe to assume at this point of time that the creation and successful execution of these laws will take a considerable amount of time. Though many younger users seem willing to tolerate a lower quality of service for uninterrupted linear video viewership, customers would still have to rely on pay-TV providers.

**The Way Forward for Pay-TV Providers**

The new wave of OVD services might not have a disruptive effect on the pay-TV model for all the reasons discussed above. Meanwhile, some subscription-based OVD services appear to have reached saturation in terms of U.S. subscriptions. This is one reason Netflix has now expanded its international presence to more than 130 countries, after establishing a foothold in key European countries.

Curiosity among ardent fans of particular programming could result in additional churn for pay-TV providers for a few months after the launch of OVD services by content providers but they should still be the preferred choice to view linear video content. Thus, there will be no long-term customer churn for pay-TV providers due to the launch of these services. Figure 3 outlines next steps for pay-TV providers in the current climate.
As video entertainment evolves, it is essential for pay-TV providers to reinvent themselves and take advantage of their superior content delivery infrastructure to stay relevant in the eyes of customers. Based on customer acceptance and market dynamics, pay-TV providers should consider the following recommendations to improve their viability.

Start Doing

Pay-TV providers must start experimenting with new video delivery options and business models to attract more customers, including:

- **TV streaming services.** The last year has seen a string of TV services being launched over the Internet. In early 2015, Dish TV announced the launch of an OTT TV streaming service called Sling TV, priced at $20 per month. Verizon targeted mobile users with Go90, an ad-supported free service, in the latter half of 2015. Comcast launched Stream TV in some markets for its broadband subscribers, which offers a basic package with 28 channels for $15 per month. The recent announcement that AT&T/DirecTV are set to launch TV apps by end of 2016 emphasizes the growing demand for these services. Cord cutters and cord nevers could be the main consumers of such services due to attractive pricing options and ability to access content from various Internet enabled devices.

Long Term Evolution (LTE) multicast is among the new technologies that could be crucial in ensuring the quality of live streaming of content for such services by wireless players. IP-managed services like Stream TV by Comcast also ensure better video quality by restricting service to their broadband network. This could be a major differentiator for OTT TV streaming services and other OVD services for enhancing quality of service. A major challenge to pay-TV providers to launch such services would be to strike carriage deals to distribute content over several regions. Dish TV and Turner Networks had tough negotiations in 2014 during contract renewals, resulting in blackouts. Meanwhile, the basic package offered by Sling TV features channels such as Turner Network’s CNN, TNT, TBS and Cartoon Network. This could be an indication of how difficult carriage deals will emerge as pay-TV providers look to maximize their revenue potential through innovative services.

Non-pay-TV providers are also moving into this territory, which will make it all the more competitive. Apple has delayed launching an OTT TV service in spite of having several talks with broadcasting companies. Sony partnered with 21st Century Fox, CBS Corp, NBC Universal and Viacom to launch such a service with a large bundle of channels starting at $30 per month.
Customization of bundles. A Nielsen Advertising and Audiences report reveals that even though an average U.S. TV house receives 189 channels, customers only view an average of 17 channels consistently. Availability of such a high number of channels is partly responsible for this package being significantly more expensive than other OVD services. Sling TV provides only about 20 channels in its basic package priced at $20 per month. But customers have the choice to add genre-based packages at an additional cost of $5 per month. The announcement of HBO as an add-on channel for Sling TV subscribers shows how such services could substitute regular pay-TV bundles in terms of premium content availability. Custom TV by Verizon is also gaining popularity with a slimmed-down base package of roughly 40 to 50 channels with add-on packages based on customer choice. Reducing the number of channels per bundle and increasing customization in channel selection will likely prove to be an attractive proposition for cord cutters and cord shavers.

Device-performance analytics to improve customer experience. Pay-TV providers have a dubious record of maintaining customer satisfaction. According to a survey conducted by American Customer Satisfaction Index (ACSI) in mid-2015, pay-TV providers scored 65 on a scale of 100. This is one of the lowest scores among all 43 industries tracked by ACSI. Using analytics beyond personalization and content recommendation could be the key to improving customer satisfaction scores. Device-performance analytics can be used to predict which customer premise equipment is mostly likely to fail and when. It can also be used to continuously monitor the health of set-top boxes and DVRs and determine the likelihood of performance degradation. A renewed focus on reliability and quality is necessary to clearly differentiate pay-TV services. Such proactive steps will go a long way in improving their perception among customers.

Keep Doing

Some strategies adopted by TV providers to counter the popularity of OVD services have gained customer acceptance. It would be prudent for these companies to invest further in the following going forward:

Deployment of new-age DVRs. A large majority of U.S.-based pay-TV subscribers still use legacy set-top boxes with limited storage and a poor user interface. Cloud DVRs and hybrid DVRs are increasingly becoming popular among TV subscribers as they provide a host of new features compared with a traditional set-top box. Features that will vastly improve customer experience include: Using the cloud to increase video storage space, ability to record multiple live streams simultaneously, unified experience across mobile devices and TVs, video delivery to multiple set tops and other IP-connected devices in subscriber homes and integration of multiple services on a single platform (such as home-automation notifications while watching a movie on TV).

TV everywhere. Accessibility across different platforms and devices is a major reason for the popularity of OVD services such as Netflix, Hulu and Amazon Prime. All the major U.S. pay-TV providers have launched “TV everywhere” services that allow customers to view content from Internet-enabled devices. Though the effectiveness of these services is in question, they are in place and could be leveraged with exclusive content and more promotion, especially by smaller pay-TV providers. There may be a benefit to combining these offerings with OVD standalone services as part of new agreements.
TV everywhere service has also evolved over the last few years from a platform where broadcasters validate a customer’s TV subscription to pay-TV providers directly validating its users. Comcast’s X1 app is a prime example of how these services have grown from mere content aggregation to bundling other services such as home-automation control and voicemail notification, thereby enhancing the value proposition to the end user.

- **Improving monetization by dynamic ad Insertion.** Dynamic Ad Insertion (DAI) refers to the technology used for personalizing advertisements in on-demand and TV everywhere titles. DAI is becoming more relevant as seen in the Viacom/TWC and Turner/Comcast carriage deals. Rising content-acquisition costs make it necessary for pay-TV providers to extract more revenue from different streams. Ad revenue through DAI could be a significant revenue source for pay-TV providers going forward. Issues that must be addressed before DAI takes off: Customer acceptance of ads for premium on-demand content and effective measurement of ads for time-shifted content.

- **Rent/buy on-demand titles.** Use of VOD content by pay-TV providers is slowly gaining popularity with consumers. According to a Digitalsmiths report published in Q3 2015, almost 29% of subscribers rented VOD titles from their pay-TV catalog, a 2% increase compared to last year. Roughly 66% of the customers surveyed said discovery of VOD titles is easier, which is a 22% improvement compared with Q3 2014 figures. Transactional VOD is a competitive space with players like Amazon Video, Redbox kiosks and iTunes providing a wide array of video selections. Pay-TV providers need to improve their video content selection and increase service adoption to attract more viewership. Free on-demand marathons by Comcast and Verizon — which have garnered a strong consumer response in the past — could be an effective way to improve customer awareness.

**Stop Doing**

Pay-TV providers need to rethink strategies that could be detrimental to their bottom line over the long run. These include:

- **Launching similar on-demand services.** Services such as Streampix (Comcast) and Redbox Instant (Verizon) were launched to compete head on with OVD services. They were priced below popular subscription OVD services such as Netflix and Hulu and garnered initial market interest. But both these services were discontinued in the latter half of 2014 due to lack of customer awareness and limited choice of content. Since players like Netflix, Hulu and Amazon Prime have accumulated large libraries of video content over several years and provide access on several platforms, launching similar services will require huge investments for new entrants to be heard above the din.

- **Partnering with OVD services.** U.S. pay-TV providers such as Dish TV, CableOne, MediaCom and Suddenlink — along with some regional players — have integrated their video offerings with Netflix. Cablevision has gone one step further by partnering with Netflix, HBO NOW, Hulu, CBS All Access and some other OVDs to position themselves as a broadband-first company. This could eventually result in reduced pay-TV subscriptions for these service providers and more broadband usage. Even though broadband subscriptions are soaring, pay-TV average revenue per user (ARPU) is roughly twice that of broadband ARPU. Revenue sharing between them would be quite different from the traditional model between pay-TV providers and broadcasting networks.
According to a Wall Street Journal report, Netflix pays a one-time bounty and a small recurring monthly fee for new subscribers that sign up through an operator’s set-top box. Those payments are much smaller than commissions that operators receive for selling premium channels such as HBO. In at least some of these cases, operators don’t receive a cut of existing customers’ Netflix bills. Hence, such a move is more beneficial to Netflix since it can address the needs of customers with set-top boxes apart from the wide array of devices that it supports. Such a move could also adversely affect the total revenue of the service provider going forward.

The second wave of OVD services by content providers in 2015 was not as catastrophic for pay-TV providers as some would have predicted. But it has set the stage for an exciting year ahead where TV services are going the extra mile to stay relevant in this highly dynamic and competitive video entertainment space.

Footnotes
5 http://www.broadbandtvnews.com/2013/11/20/netflix-leads-swedish-vod-services/.
About the Authors

Jim Elayan is Director of Strategic Technology Platforms for itaas, a Cognizant company. He brings over 20 years of cable TV and telecommunications experience as well as cross-industry marketing and business development experience to the organization. In his current role, he is responsible for strategy and business development on new technology initiatives, working directly with customers to create solutions across a host of software and hardware platforms including cable, IP and wireless technologies. His role includes assisting with the initial creative design concept, identifying key consumer-appeal points, GUIs, technical viability and ROI analysis, to the successful launch of a variety of interactive applications and revenue generating solutions. Over the past few years, he has led teams in launching applications on iOS, Android and SmartTV platforms. The solutions include consumer-facing services including connected home and video-centric offerings and are currently available through online app stores or major service providers in the United States. He received his M.B.A. from Emory (Goizueta) Business School. Elayan can be reached at Jamil.Elayan@cognizant.com.

Abraham George Thengungal is a Consultant with Cognizant Business Consulting’s Communications and Technology Practice and has worked with North American companies in transformation and process improvement initiatives. He has five years of experience in the field of eTOM, business process modeling and networking technologies. He holds a B.Tech. degree from the National Institute of Technology, Calicut and a Master’s in Business Administration from NMIMS, Mumbai. He can be reached at AbrahamGeorge.T@cognizant.com.
And the Winner Is...?¹

By David Ingham

Our data-driven approach to predicting this year’s Oscar winners provides a model for broadcast programmers to extract actionable insights from data.

In November 2015 a group of Cognizant colleagues started talking about trying to predict the Oscars using analytics and social data. This would be a way, we believed, to showcase analytics’ massive potential use in media and entertainment. We were lucky to find a skilled partner in Clarabridge that could help make sense of the huge amounts of data that were available.

Cutting to the chase: We were very successful in some of our predictions (including the nominated films) but we were less successful in determining the ultimate winner. Along with a lot of others, including bookies, we were sure The Revenant would take top honors rather than the eventual Best Picture winner, Spotlight.

The fact that we were ultimately wrong in our choice of best picture does not mean the experiment was a failure. We learned much. This sort of prediction exercise needs to be iterative. Were we to do it again next year, we would likely use different variables, and perhaps, weight them differently. Predictive analytics is a nascent area, and unexpected outcomes are to be expected. This project was a showcase for how analytics can drive business outcomes and make a serious impact on the bottom line. The hope is broadcast executives can benefit from our experience.

Behind the Scenes

There are several high-profile predictive models for the Oscars, but most of them either aggregate critics’ predictions or rely on winners of other award shows to guess the outcomes. While they may be accurate at times, they don’t provide any insights to the studios and production companies that are trying to architect a winner 12 to 18 months in advance.

We specifically wanted to create a model that got to the core of the voting behavior of the Academy and generated prescriptive analytics that could be used by marketers, creatives and executives. The only insights these other models offer is to win other awards, but our model provides real levers for creative, marketing and advertising to pull that will add significant value.

The Model

Our model attempted to replicate the voting behavior of the Academy by evaluating IMDB and Rotten Tomatoes ratings and reviews. Our team derived over 150 variables from this data (for example, metadata, word of mouth, net promoter score, emotion, sentiment). Then, we ran calculations to determine which of the 180 variables were highly correlated to the results and identified 75 that seemed to be the most significant to be part of the predictive model. We analyzed the combinations of all of these variables to arrive at the ones that were highly correlated with winners based on analysis of the prior 15 years.

The Academy voting body is traditionally fairly static, with no one leaving voluntarily and only a few new voters coming in each year. However, this has recently changed which may make the voting patterns more sporadic.
We wanted to showcase what could be done with open-source data, so no proprietary data sets were part of this. However, based on the outcomes we strongly believe that the modeling could be further enhanced by proprietary data. In our model, the films were selected by data, as opposed to someone viewing the films.

Biases

You may have read about the issues with diversity this year, and while we were not able to model any diversity bias we did model other biases. The first is a genre bias. It’s very clear that certain genres have a better chance of being nominated, but it is very dramatic when this information depicted in a visual (see Figure 1, below). The graph plots genre against critic and audience ratings, with the size of the bubble being the number of nominations.

Drama is clearly the most nominated genre, followed closely by biography and romance. When you add box office to this analysis you find that some of the genres can overcome this bias with much higher box office. However, it is very clear in the absence of a break out cultural hit the Academy is looking for a very specific profile to nominate.

We did also find evidence of gender and age bias (see Figure 2). When you consider that the average Academy voter is male, white and 63 years old, it is not hard to imagine. The IMDB data was segmented by age and gender, so we could monitor the average ratings by segment and see how each was at predicting the outcomes. We found that films that had reviewers with a similar mix to the Academy average would most frequently garner the nominations and awards. This led us to exclude films like Carol and Straight Outta Compton from our predictions as those skewed either female or young in their reviews. In fact, we also found that Oscar winners had 13% fewer female reviews than Oscar nominees, indicating that films that appealed to men had a higher chance of winning awards.

Genres of Films Nominated in the Oscars

Source: Cognizant and Clarabridge

Figure 1
Emotional Intensity

The other primary indicator we found was emotion. Often, intense negative emotions such as revenge and anger are leading indicators of awards as well (see Figure 3). If you can elicit these emotions in an audience such that they talk about them in the context of the character, that is very good. It means that the audience member has internalized the struggle and identifies heavily with the character. In this situation, even if the audience associates a negative connotation to a specific word they will still feel a strong bond with the character and talk about these intense negative emotions with passion. Anger seems to be a significant emotion that resonates with the audience and is present significantly more in Oscar winners than Oscar nominees.

Nominees and winners alike tend to generate strong feelings in viewers and critics. Films that elicit strong, visceral reactions are the ones that stay with you.

Gender Difference Between Oscar Winners and Nominees

Source: Cognizant and Clarabridge
Figure 2

Emotional Resonance (Oscar Winners vs. Nominees)

Source: Cognizant and Clarabridge
Figure 3
From these basic observations we started to build a hypothesis that if you have a film that is good but doesn’t generate intense feelings, then releasing it in December is a good play. There might be just a few days between release/screenings and submitting the ballot, and the film might succeed in being nominated.

Audience-to-Critic Correlation

What about the Audience to Critic correlation? The median critic score for all nominees was 92%, and the median audience score was 88% — not much of a difference. We could not find evidence to support the popular notion the Academy selects films that are critical darlings but that don’t garner many viewers. We found there is in fact a significant relationship between what critics think and what the audience thinks.

One element that was a significant indicator for us was Net Promoter Score. NPS tries to identify those who would recommend the film or product and subtract those who would detract from it. NPS ignores the middle ground. You end up with a score between 100 and -100 where 50 is a very good score. We found a very telling statistic: Winners averaged a much higher NPS than nominees, and we didn’t see any in recent history that had a negative NPS. This was the single biggest item that eliminated films.

Predictive Analytics: Lessons Learned

Going back to the objectives of this project, the primary goal was to come up with insights and a model that would ultimately yield prescriptive insights that will allow a studio to influence the nominee and winner results. Some conclusions from our maiden project:

- Nominees generate better return on investment than winners.
- This model helps studios determine if the money spent on a film is a good investment from an Oscars standpoint.
- Marketing efforts including trailers should feature the most intense emotions the film has to showcase.
- Releasing a film at the end of the year could increase its chances of a nomination.

“Word of mouth” and “reading reviews” are the most commonly mentioned reasons for going to see the Oscar-winning films. But the reviews/comments also gave us input on the marketing that was being executed for the film.

Studios can leverage this insight to routine marketing campaigns to test the effectiveness of certain sentiment or themes in the marketing, and to test the outcome of that marketing. We believe analytics can be used for many decisions a studio makes, including:

- A/B testing.
- Predicting the effectiveness of a film’s marketing mix.
- Predicting box-office results.
- Modeling the impact of various actors in a role.
- Aligning the marketing assets to customer segmentation.
- Influencing the slate from a genre- and release-date standpoint.
Quick Take

Predictive Analytics: Lots of Potential but Use is Still Nascent in Media and Entertainment

The use of analytics is fundamentally changing all aspects of the media and entertainment industry, from sales and marketing to creative and product development. We all have heard the marquee examples of Spotify using analytics to identify the popularity of Lorde early on based on regional data or Netflix using behavioral data to architect House of Cards. However, analytics isn’t just a tool for disruptive technology players, it can – and should – be used by all organizations to identify macro and micro trends and support decision making across the organization.

In a recent Cognizant survey of media and entertainment executives, we found most organizations are still finding their footing with analytics. Compared to Netflix, the rest of the industry still seems to value experience over data. More than half (56%) of the survey participants said they value gut instinct as their primary decision-making tool. But the ROI for using analytics is enticing.

One survey respondent said his organization is making incremental use of consumer insights but it’s “not yet a game changer.” Going to the next level with analytics may well require additional investment in products and professionals; many organizations were not yet ready to go there.

Without those additional investments, survey respondents estimated analytics alone could drive a revenue increase of 7% to 15%. But the use of analytics doesn’t imply the coming automation of all corporate decision-making. Netflix, for example, uses customer analytics to select acquisitions and greenlight its original content. But even Ted Sarandos, chief content officer at Netflix, admits decisions are driven 70% by data and 30% by gut instinct and experience.

Most organizations acknowledge analytics are valuable, but are just finding their footing. Nearly 90% of the organizations we surveyed have extracted usable insights from Big Data they have collected. However, only 25% of respondents judge themselves effective at extracting those insights. In between these numbers exists a chasm that needs to be closed, or organizations will leave much money on the table. In most cases, to become more effective with analytics requires investment in new talent, new processes and new tools.

Companies have a very real opportunity to leverage existing data to grow the business — the equivalent of finding change in the sofa cushions. Those organizations that make additional investments to get the most out of analytics will find themselves ahead of the competition.

Footnotes

Looking Ahead

The vast majority of studios and broadcasters has invested in analytics and Big Data. But they often struggle with how best to make sense of all that data and integrate it into their business processes for decision-making. “Boiling the ocean” of data looking for patterns, without really having a good handle on the actual questions they seek to answer, is not the way to go. Media and entertainment companies may need a workshop environment to explore such matters as prioritizing questions for exploration, designing experiments to test those themes, specifying the reports and data sources needed and focusing on near-term impact in an innovative manner.

For broadcasters, cable networks and digital media companies, analytics may help cross-reference and correlate internal and external data sources, including website purchases, content sampling, web page hits, social media listening and many others. These rich data sources, along with traditional data including opt-in consumer profiles, CRM contact history, email marketing responses, and aggregate demographic data can be leveraged to improve decisions in the following areas:

- Increase relevance and stickiness of programming.
- Better inform production and programing decisions.
- Monetize back catalog for video on-demand (VOD) and streaming.
- Decrease subscriber churn.
- Increase relevance of targeted advertising value.
- Reduce cost of advertising to smaller relevant and engaged niches.
- Increase the effectiveness of marketing spend.

In conclusion, we explored a simple model. We were able to identify some insights that could impact the outcome and provides potential levers for marketing to pull that could influence a film to be a nominee or a winner. Our model got a lot of things right but fell just short of naming the big winner. For a first foray, that is acceptable. The point is, any title-based business can do this – publishing, television, music. And the powerful thing is that our experiment used only open/social/public data. Your company has proprietary data at your disposal that could make these models even more powerful.

Footnotes


About the Author

David Ingham is Director of Consulting within Cognizant’s Information, Media and Entertainment business unit based in London. He has more than 16 years of experience as a media consultant. Most recently, David has focused on digital transformation within the publishing and education sub-segments, including the impact of digital on business models (order-to-cash and record-to-report), rights and royalties, and customer engagement with content. He holds an M.B.A. from Pepperdine University and attended the London School of Economics and Kalamazoo College as an undergraduate. David can be reached at David.Ingham@Cognizant.com.
Broadcast Engineering and IT: Bridging the Cultural Divide

By Blake White

Broadcast engineering infrastructure is moving toward computer-based commodity IT platforms. This shift is causing a gulf to open between traditional broadcast engineers, who lack knowledge of the digital realm, and the IT-focused engineers, who lack the knowledge and experience of analog. Both sides need to overcome their differences, allowing them to embrace the new broadcasting infrastructure – and the new role of “media technologist” that will replace the old.

As broadcast engineering infrastructure moves toward computer-based commodity IT platforms, the traditional broadcast engineering skills of analog broadcast signals are decreasing in importance. At the same time, the lack of knowledge of the digital realm is becoming problematic for the traditional broadcast engineer. As more IT-oriented engineers join the industry, they arrive without knowledge or experience with things that broadcast engineers consider to be sacrosanct. It is good to stop and consider what skill sets each side brings to the table, and why do they view each other so differently? Both sides need to overcome their differences, allowing them to embrace the new broadcasting infrastructure – and the new role of “media technologist” that will replace the old.

Broadcast engineering support roles are expected to manage all engineering aspects of the technical facility including studio, editing systems and transmission of live/taped programs and events, in a 24x7x365 news and/or entertainment production environment with attention to availability, performance, capacity planning, and implementation. This might include:

- Ensure all PLN transmission equipment is operating correctly before and during live event telecasts. Correct and document technical problems and report them to the manager.
- On-air quality control.
- New equipment installation/maintenance/repairs in a state-of-the-art broadcast, media and IT environment.

During his Rede lecture at Cambridge in 1959, Lord C.P. Snow stressed the need to bridge the “two cultures” of science and the arts, reminding “It is dangerous to have two cultures that can’t communicate.” Snow might draw a similar analogy today between the broadcast engineer’s practical “arts” and the theoretical “science” of the new, IT-focused engineer being hired into broadcasting today.
- Technical quality supervision for studio productions, live events, remote feeds, etc.
- Perform equipment repairs, system installation/integration and training/guidance for operations personnel.
- Troubleshoot equipment where problems occur and perform regular maintenance tasks (including repairs, equipment replacement, supplies), documents and executes necessary corrective actions.
- Provide end-user technical support with satellite feeds, non-linear editing equipment, video server systems, digital audio mixing equipment, video productions switchers, graphics platforms, camera/robotics systems, studio lighting, intercom systems and the like.
- Act as after-hours emergency on-call person.

Broadcast engineering support skills often encompass:

- Minimum of five years of broadcast/media facility experience, preferably in a modern high-definition environment.
- Knowledge in all areas of television production and familiar with all studio production equipment.
- In-depth working knowledge of control room, non-linear editing, IT, ENG, studio and remote technologies and systems.
- Expert familiarity with audio and video signal measurement equipment, standards and practices.
- Strong knowledge of technical setup in file-based editing systems including networking and storage solutions.
- Maintaining Avid ISIS/Interplay and Apple Final Cut systems with archiving LTO systems.
- Significant experience with IT/network administration.
- Computer operating systems knowledge is a must.
- Strong analytical and reasoning skills are essential as well as technical troubleshooting skills.
- Bachelor’s degree in Engineering or related.

Whereas, IT support roles might call for developing and executing engineering projects as assigned, independently or as part of a team, including integration oversight and collaboration with system design and implementations resources. This might include:

- Serve as a production systems engineer across multiple client groups, systems and workflows.
- Monitor system health across environment using SiteScope, Zenoss and other similar utilities and respond to any alerts from the system.
- Perform preventative system maintenance and administration.
- Work with ticketing system to respond to customer issues.
- Operate and support a suite of Java-based Web Services.
- Participate in the development and testing of internal tools, scripts and other coding projects to interface with RESTful Web Services.
- Work with application developers and QA team to isolate customer issues.
- Perform technical-issue documentation, escalation and follow-up with vendor support and clients.
- Contribute in writing and in person to root-cause analysis meetings as part of process improvement.
- Train L1 support team on supporting in-house developed application.
- Provide 24x7 L2 support on open-source software and in-house developed software.

Likewise, IT roles often require a thorough understanding of the software development lifecycle, including the application design, testing and release processes, that can be used to support and contribute to the development of applications. IT staff may need to come to the job with:

- Proficiency of Unix administration concepts and best practices for Red Hat Linux, Oracle Linux and HPUX in an enterprise computing environment.
- Experience working in a Windows Server
environment with basic knowledge of Windows usage and administration.


- Database administration and architecture concepts and practices using Oracle and DB2 (at a minimum), in addition to other database technologies that may be used by production or lab systems: MySQL, Sybase, Postgres, NoSQL database management and deployment.

- Knowledge of storage administration concepts and practices using EMC, Ibxix, Netapp, and/or 3PAR in addition to related management and backup software.

- Solid understanding of network protocols and standards (e.g., DNS, TCP, HTTP, FTP, SSH).

- Experience with configuration management tools (Chef, Puppet, Saltstack), system imaging and deployment, especially via Casper Suite, and monitoring systems like Splunk.

- Bachelor’s degree in Computer Science, Electronic Engineering and five-plus years of recent experience in a television broadcast environment.

These two perspectives reveal a lot about the underlying value systems of the two cultures. Compare typical practices and technologies used by the practitioners in broadcast and IT, and we see:

It’s telling to look at how the two cultures view their approach to supporting their respective systems. For example, Thomson Broadcast’s current website shows its SLAs focus on “fix it – now!” Whereas IT software systems SLAs focus on the thresholds for “acceptable downtime.”

In the broadcast world, there is no such thing as “acceptable downtime.”

As a result, we hear these kinds of thoughts from broadcast engineering executives:

- “There is frustration that IT and broadcast run projects differently. Broadcast does not use a lot of project management approaches that are fundamental to IT. We have light documentation at the beginning and then detailed documentation at the end. IT works the opposite way.”

- “The focus should be on the policies and procedures of the management and support of broadcast systems and the ownership of same, especially where they intersect.”

- “Support could be a category of requirements and pain points unto itself.”

- “The key issue is the identification of who is accountable for the support. Right now, people don’t know who to go to for various forms of tech support. They need a comprehensive service plan for their systems that cover the ‘who, what, when, and where’ of support.”

These two support philosophies and skills sets create a host of contrasts in the modern broadcast environment:

<table>
<thead>
<tr>
<th>Traditional broadcast engineering</th>
<th>Vs.</th>
<th>IT support engineering</th>
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<tbody>
<tr>
<td>Live broadcasting</td>
<td></td>
<td>On-demand download/streaming</td>
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<td>Precise measurements</td>
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<td>Estimates</td>
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<td>Single-function appliance</td>
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<td>Multi-function platform</td>
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<td>Rigorous design</td>
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<td>Agile prototyping</td>
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<td>Redundancy/failover</td>
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<td>Reboot the system</td>
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<td>Slow migration of systems</td>
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<td>Revolution and disruption</td>
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<table>
<thead>
<tr>
<th>Traditional broadcast engineering</th>
<th>Vs.</th>
<th>IT support engineering</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never down, no dropped frames, minimal latency</td>
<td>Planned downtime, minimal viewer impact, acceptable buffering</td>
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<tr>
<td>Drop everything “all hands on deck” 24x7 support</td>
<td>Trouble ticket, problem queue and bug fix/release</td>
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<tr>
<td>Static appliance that “just works”</td>
<td>Continuous patches</td>
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<tr>
<td>Appliance switch-outs</td>
<td>Major software upgrades</td>
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<tr>
<td>Five to seven-year depreciation</td>
<td>Two-year obsolescence</td>
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... and never the two sides did meet.

But radical competitive change is causing a reevaluation in broadcast engineering (see Figure 2):

- The traditional content producers (ABC, CBS, Fox, NBC, PBS) vs. traditional distributors (Comcast/TW Cable, DISH, DIRECTV/AT&T, Verizon) vs. new-generation distributors (Google/YouTube, Amazon, Microsoft, Apple/iTunes, etc.) vs. competition for your time from social, user-generated content (UGC) and more personalized content.

Online and mobile are becoming the first design point for TV.

The big technological change that Society of Motion Picture and Television Engineers (SMPTE) Fellow John Luff foresees for the broadcast industry is the eventual elimination of what he calls “purpose-built hardware for television broadcast use exclusively.” He suggests, “We are currently in the last generation of purpose-built hardware, and I expect that it will go away entirely in the next decade.”

We can also learn important lessons from other engineering disciplines about how to engineer for human roles in complex systems.

Software engineers do not think of what they do in social terms. Influential author Robert Pool argued for a design approach that accepts that people make mistakes and that organizations get sloppy and takes those factors into account in the engineering process. This is in stark contrast to the machine-centered philosophy of engineering, where one designs a plant so that it does its job efficiently, then expects people and organizations to adapt to it.

Fritjof Capra outlined a new way of thinking about technologies and engineering design is in its early stages. The new scientific understanding of life based on non-linear dynamics, or complexity theory, combined with some spectacular technological failures and risks, are forcing the technology community to re-evaluate design goals. When it comes to complex systems, the emphasis needs to be on making operators of technology more effective, instead of making machines more effective.

The broadcasting industry should consider systems that inform humans, in great and varied detail, rather than blindly automate and delegate important and risky operations to machines. As technologies become more complex, Pool believes, engineers will find it increasingly necessary to take human perfor-
performance and, eventually, organizational factors into account in their designs. For instance, Pool argues in favor of high-reliability organizations that build safety into the systems and processes from the start, rather than adding it on as an afterthought.

We need better training for these new blended roles. The joint SMPTE-Stanford Center for Image Systems Engineering (SCIEN) symposia – Entertainment Technology in the Internet Age featured non-traditional broadcast themes that hint at these new roles, enabled by Silicon Valley technology, including:

- Storytelling, Transmedia Style.
- Quality Over the Internet: Oxymoron or the Future?
- Is The Technology of The Internet the New Standard For Quality Video?
- Sounding Good Over the Web: Accessible, Immersive, and Personalized Audio.
- Live Sports Everywhere!
- User Data Coupled with Technology Can Facilitate Business Models Regardless of Platform or Device.

Traditional broadcast engineers are trained to solve problems based on time-honored experience in the business, while the new generation of IT-based broadcast engineers view solutions as prescribed by structured technology. There needs to be more cross-pollination of training and discipline, not to mention patience and acceptance. We need a training and education system that recognizes these need to be hybrid. The new role of media technologist will merge the two worlds.

Footnotes

1 Originally presented at the PBS Technology Conference, 2015.
3 From public job descriptions and LinkedIn™ profiles.
4 From public job descriptions and LinkedIn™ profiles

About the Author

Blake White is a Consulting Partner in Cognizant Business Consulting’s Information, Media and Entertainment (IME) practice. He led digital transformation programs, consulted on the alignment of technology roadmaps with business strategy, and supported M&A decisions across the content value chain. Over a 30-year career, Blake held senior positions at PwC, Ascent Media Consulting Services, SGI, Apple, HP, P&G, and three startups. Blake holds an M.L.A. from Stanford University, an M.B.A. from Xavier University and a B.S. in engineering from North Carolina State University.
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U.S. Headquarters:
211 Quality Circle
College Station, TX 77845
Tel: +1 979 691 7700
Fax: +1 979 691 7700
Toll Free: +1 855 789 4268
Email: inquiry@cognizant.com

India Operations Headquarters:
#5/535, Old Mahabalipuram Road
Oikkayam Pettai, Thoraipakkam
Chennai 600 096 India
Phone: +91 (0) 44 4209 6000
Fax: +91 (0) 44 4209 6060
Email: inquiryindia@cognizant.com

China Operations Headquarters:
Cognizant Technology Solutions (Shanghai) Co.
Zhongjiang Hi-tech Park
Building No. 5, No. 3000 Longdong Avenue
Shanghai, Pudong China 201 203
Phone: +86 21 6100 6466
Fax: +86 21 6100 6457
Email: inquirychina@cognizant.com

World Headquarters:
500 Frank W. Burr Blvd.
Teaneck, NJ 07666 USA
Phone: +1 201 801 0233
Fax: +1 201 801 0243
Toll free: +1 888 937 3277
Email: inquiry@cognizant.com

European Headquarters:
1 Kingdom Street
Paddington Central
London W2 6BD
Phone: +44 (0) 20 7297 7600
Fax: +44 (0) 20 7121 0102
Email: infouk@cognizant.com

Philippines Headquarters:
Cognizant Technology Solutions Philippines, Inc.
5th & 6th Floor,
8/10 Upper McKinley Road Building
10 Upper McKinley Rd.
McKinley Hill, Fort Bonifacio
Taguig City 1634 Metro Manila
Philippines
Phone: +63-2-976-2270
Email: inquiry@cognizant.com

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