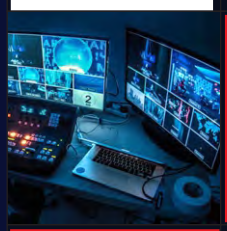
BROADCAST - FILM - POST - INFOTAINMENT TECHNOLOGY

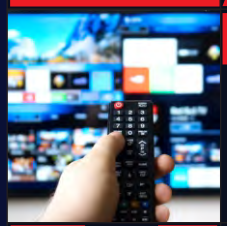
BROADCAST & FILM

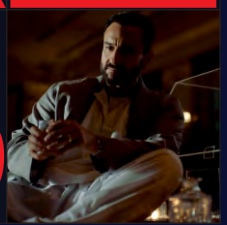
GLOBAL MEDIA FOR BROADCAST, FILM, POST & INFOTAINMENT TECHNOLOGY & BUSINESS

JANUARY - FEBRUARY 2021

2021 MEDIA TRENDS







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2020 Media Kit

BROADCAST & FILM

- Your #1 Resource to Reach Broadcast, Film, Post & Infotainment Technology Markets in India

Broadcast & Film – www.broadcastandfilm.com – is a leading online publication serving the broadcast, film, post and infotainment technology markets globally. From being published since 1991, to its shift to the online platform in 2013, the magazine has established itself as a credible source for industry news, analysis and technology trends in the broadcast and entertainment technology industry. We cover the emerging new technologies and trends, including the transition to the digital phase of the ever-evolving media and entertainment sector.

Helping You Stay A Step Ahead of the Competition

If your company wants MAXIMUM visibility in the broadcast, post-production market, then Broadcast & Film is your #1 Resource. Broadcast & Film will provide your company with an effective package of advertising via our industry leading online digital media, E-newsletter, broadcast e-mail service, mailing lists, and website to reach the broadcast markets.

Broadcast & Film features the most widely circulated digital online media and E-newsletter and provides the best-quality editorial coverage of the trends, events, and happenings in the market. Suppliers of broadcast products and services who want to stimulate sales growth in an increasingly competitive environment advertise in Broadcast & Film to help their business thrive!

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Digital Advertising Rates

Website Banners

- Home Page
- News & Feature Page

Emailers

- Dedicated broadcast e-mail
- Broadcast & Film e-newsletter banner

Web Requirements

- Home Page - width 300 pixels x depth 250 pixels
- News Page - width 160 pixels x depth 600 pixels

Resolution: 72dpi

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MANOJ MADHAVAN
Editor

Consumer behaviour saw dramatic changes in 2020 due to the Covid 19 impact. 2021 will see broadcasters gaining an insight on the behaviour pattern of the consumers and preparing a game plan on how to effectively produce traditional content and also increase on-demand services.

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From the Editor's Desk

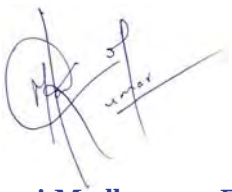
The media and broadcast industry are cautiously looking at 2021 as a 'YEAR' of stability where they are able to recoup and get back to a semblance of sanity. Content aggregators have their work cut out for them. The core media operations like content production have been badly affected in the pandemic. While live remote production is relatively mature, content producers are grappling to produce file-based episodic content remotely. As content libraries saturate, producers will need to find creative ways to generate compelling information remotely to engage consumers and pivot towards an agile way of working. The industry will need to adapt its operating model to support remote production. Many of the post production studios are adapting remote production and delivering quality output.

2021 will also see a consolidation in the technology trends in the media and broadcast ecosystem, Consumer will ultimately become the 'KING' and will have the freedom to chose from a plethora of options in front of him.

Consumer behaviour saw dramatic changes in 2020 due to the Covid 19 impact. 2021 will see broadcasters gaining an insight on the behaviour pattern of the consumers and preparing a game plan on how to effectively produce traditional content and also increase on-demand services.

AI driven experiences, new cloud deployments, super-aggregation are key tech trends in broadcast sector which will be seen in 2021. All of this will result in consumers getting in the driving seat and industry will see great collaboration to create aggregated content and device experiences.

Media technology is one of constant change and increasing complexity and the entertainment and media industry will also bounce back. But they have to be agile and realign their strategies in terms of their data, business and content work flows. They should use their brands, content and audience relationships to stay relevant and use their industry expertise, combined with a platform-centric business model, to innovate and evolve. That should guide them through the tough times and look at better times ahead!



Manoj Madhavan - ***Editor***

SURGE IN SMARTPHONE VIDEO VIEWERSHIP

Boston Consulting Group (BCG), a global management consulting firm, and the Confederation of Indian Industry (CII) have unveiled a report, 'Lights, Camera, Action…and the Show Goes On', which seeks to evaluate the impact of this very extraordinary year on the media and entertainment industry and highlights key imperatives for increasing the industry's resilience in the face of adversity.

According to the report, 2020 has seen a massive surge in TV and smartphone video viewership during the weeks of lockdown and beyond as people spent more time at home, and OTT witnessed its presence increase in tier 2-4 cities due to the high quality, original, and local content marketed using free trials. Covid-19 has had a major impact on how we consume content, both in-home and outside and some of these will have long-term implications for the industry.

"India continues its unique multimodal growth. TV consumption surged ~40% during lockdown due to an increase in non-prime time viewing. Smartphone video consumption is up as well, with a 50-60% increase in subscribers over last year. Going forward, we expect the digital trend to intensify, OTT adoption to continue rising, and the emergence of new business models better suited to the new reality. The share of digital in advertising will also continue to grow, having reached 15% in 2020, a full two years before its pre-Covid forecast," said Mandeep Kohli, Partner, Boston Consulting Group India.

Disney+ Feature Safety Uses Production Through Post DaVinci Resolve Studio Workflow

Blackmagic Design announced that the Disney motion picture "Safety" utilized a complete DaVinci Resolve Studio workflow from principal photography through final delivery, incorporating an innovative digital asset management (DAM) system on set built around Blackmagic Design's switchers, recorders, routers and monitors. The film had its premiere on Disney+ this month.

"Safety" is a drama inspired by the empowering story of former Clemson University football safety Ray McELrathBey (Jay Reeves), a young man facing a series of challenging circumstances, whose dedication and persistence help him to triumph over repeated adversities. Aided by his teammates and the Clemson community, he succeeds on the field while simultaneously raising and caring for his 11-year-old brother Fahmarr (Thaddeus J. Mixson).

Even before the pandemic of 2020, the need to be more efficient and cost effective, both on set and in post, had become a priority and a necessity for ever tightening budgets. Executive Producer Doug Jones knew the practical answer was to improve the technological workflow on set, get rid of the unnecessary roadblocks between set and post, while allowing editors to better interface with production.

An early adopter of technology, years prior Jones had been one of the first pushing for full digital filmmaking, and had always felt technology was something to be embraced. The DAM workflow on the film came together out of an understanding that many of the tools used for broadcast work are equally compatible for feature film production. Jones began to see how DaVinci Resolve, combined with integrated Blackmagic hardware on set, could provide an "online all the time" pipeline, and would not only save time but also save money.

Working with director Reginald Hudlin, cinematographer Shane Hurlbut ASC and editor Terel Gibson, the team outlined how the pipeline could help make production more efficient. "There are amazing things that we have done for over a century of film production that are tried and true, and you just do not upset that apple cart," said Hurlbut. "And then there are things that come along that look like they are going to flip the paradigm and kind of change the channel. When Doug Jones came to me with this Digital Asset Management system, and showed me how it completely unified the process from pre-production to production, to post-production, I felt it was pretty extraordinary."

The process they developed was simple and manageable by one operator on set. When production cameras rolled, they automatically triggered Hyperdeck Studio Mini recorders on the DAM cart to record simultaneously, with matching

DISNEY STREAMING SURPASSES NETFLIX

Disney has drawn almost 87 million subscribers to its app. Disney+ and other new streaming-video services are still resting the waters if their offerings are complete enough for Netflix subscribers to switch over. Star India will help Disney's skyrocketing projection of at least 300 million total streaming subscribers globally within three years.

Star was evidently the bandwagon on which Disney+ is planning its new ride and set to take on Netflix. Disney purchased Star from its $85 billion acquisition of 21st Century Fox in 2019. Star is the fulcrum on which rests Disney's international streaming efforts outside the U.S

The content budget may touch between US$14 billion to $16 billion by fiscal 2024. Netflix is also investing in its service as well. Much also depends on how Disney's theme and cruise businesses will be able to bounce back

Disney reorganization of its company is intended to make it more adaptable and adjust where needed down the road.

Disney's books show $90 billion including debt spent on the acquisitions of Marvel, Lucasfilm and 21st Century Fox

time code, creating immediate playback footage. That same video feed was live graded onset with DaVinci Resolve, allowing video village and remote creatives to view only colored footage rather than raw, uncolored imagery. Thus, colored playback was available right away, with dailies available twice daily both onset as well as remotely, when uploaded to secure cloud services. Live images and recorded shots were immediately available throughout the set via ATEM 1 M/E Production Studio 4K switchers and Teranex Mini SDI Distribution 12G boxes. Audio was handled by the Blackmagic Audio Monitor 12G.

Decision makers on set that have impact on post decisions, such as directors and DPs, were able to make notes on clips that went through the DAM cart directly to editorial. Even Script Supervisor notes were added to metadata and available to editorial immediately. Camera original shots were downloaded from storage cards directly to high speed RAID drives, which were then delivered to nearby post production multiple times a day.

Hurlbut appreciated the ability to provide clear communication, all the way to the studio level. "We were able to track all metadata coming out of the cameras and put that right into our RAID system, send shots all the way up to Disney and keep everyone on the same communication level, with same day dailies that kept the studio feeling very connected to the film." The comprehensive system gave creatives at every level not only a sense of involvement, but the ability to directly interact, something Hurlbut felt was critical.

"The system enables us to engage the studio with decisions, because now they're seeing same day dailies. Imagine that we're shooting in Atlanta and we are processing all the dailies at lunch, and again at wrap. The studio is seeing dailies at four o'clock on the west coast, right before they go home. They're able to talk to Reggie. They're able to talk to the other producers. They're getting everyone dialed in. Everyone feels like they have a voice. And everyone feels like they're absolutely included in the creative process."

Editorial began from day one of production, providing a unique simultaneous process that allowed for production and post to interact. Editor Terel Gibson set up editorial in the same building as production. "We were able to stay very close to camera, which was great." Gibson cut "Safety" entirely in DaVinci Resolve Studio.

In essence, the editorial process began on set, as Digital Asset Manager Michael Smollin would sync sound with camera files, add non-destructive color correction and then create an editorial timeline, all within Resolve. "Dailies were delivered from set and were ingested into the system faster than they would be with a traditional workflow. Working with RAW dailies meant no need for transcoding. We were in essence the lab."

First Assistant Editor Rahul Das found the challenge of moving entirely to Resolve a welcome one. "I was excited to learn more about Resolve, since it was increasingly being developed as a one stop shop for editorial cutting and finishing, eliminating the need for a lab. When we started working on the project, I was immediately impressed by the different panels Resolve had designed for in depth work in color, sound and visual effects. It was initially overwhelming because in traditional editorial offline cutting we are usually just expected to do temp reference work with regards to VFX or sound design. In Resolve, even simple VFX work like green screen keying, or animating seemed to require a certain level of know how. But because the interface is very user friendly, the learning curve was fast."

Dailies were viewable within six hours after the start of each day, and a full day of dailies were available and uploaded within sixteen hours from the start of

US, INDIA OFFER GROWTH FOR OTT

India and US offers major growth for OTT players. While Disney+ has already added over 73 million subscribers, it will add another 112 million subscribers between 2020 and 2025 to reach 194 million. The report adds that Netflix will increase its subscriber base by 73 million.

"Much of Disney+'s initial growth came from the US, mainly due to the attractive bundle of Disney+ with ESPN+ and Hulu. More recently, India's Disney+ Hotstar subs count has rocketed due to its coverage of IPL cricket. The US and India will account for nearly half of Disney+' subscriber base by 2025," Digital TV Research principal analyst Simon Murray says.

According to the report, the streaming giant Netflix will take its revenue up to $37 billion and its rival Disney+ will generate $13 billion in revenue by 2025. The report adds this is a lot lower than Netflix due to lower ARPUs charged in developing markets.

the day. Editorial was never more than six hours behind the actual shoot, making the entire process responsive to changes and notes, even from the studio.

While onset tools have typically allowed basic color timing and adjustments on the fly, the more evolved Digital Asset Management solution provided quick and direct high-quality responses to the needs of set, and often helped solve problems right away. Similarly, with dailies available so quickly to executives back at the studio, color changes requested upon seeing footage could be applied right away on set, then sent back to the studio for approval, providing a seamless and immediate response.

With such fast turnaround, editorial was able to assemble scenes from the shoot day upon arrival to editorial, sometimes creating edits of scenes while they were still being shot. Rough cuts were often viewed by the end of the day or next morning. "I have never felt so close to the camera as I did during this project," said Gibson.

During the finishing process, collaboration was a big success; each team member was working from the same raw data set, thus everyone was a part of finishing. When color was applied to a shot, for example, editorial was prompted to update, and could see new color changes immediately. "We knew when somebody was coloring an image, we knew when somebody was editing something, we knew when visual effects were putting in a shot, we knew when sound design was coming in with a whole new track," said Hurlbut. "It created one communication channel where everyone could see it all live."

FUJINON Premista Lens Launched

FUJIFILM has launched its new FUIJINON Premista 19-45mm T2.9" (Premista 19-45mm), a wide-angle zoom covering focal lengths from 19mm to 45mm. The new lens will be released on 28 January 2021 as the third model to join the Premista Series of cinema zoom lenses. The Premista 19-45mm supports Large-Format sensors and delivers outstanding high resolution, natural and beautiful bokeh and rich tonality with HDR (high dynamic range).

The Premista 19-45mm is a compact and premium-quality wide-angle zoom lens, developed with FUJIFILM's optical technology nurtured over many years. It effectively controls distortion to deliver natural images with little distortion across the entire zoom range.

FUJIFILM strongly supports high-quality video production for a variety of scenes by covering wide-angle focal length and widening the range of focal length to 19-250mm, thanks to the addition of Premista 19-45mm to the Premista series which prepares the standard zoom and telephoto zoom.

In recent years, there has been an increased uptake of cinema cameras equipped with Large-Format sensors capable of delivering high-quality and richly-expressive footage at sites producing premium-quality video such as Hollywood movies. Prime lens, which has outstanding optical performance, are regularly used among lenses compatible with the large format sensors. However, when shooting with prime lenses, it is necessary to change lenses depending on the

COMPLIANCE POLICY OF FDI

The Govt has notified compliance of policy on FDI in digital media.

All eligible entities involved in uploading and streaming of news and current affairs through digital media, to comply with the decision of Government, which had permitted 26 per cent FDI under Government approval route. The entities having foreign investment below 26 per cent may furnish intimation to the Ministry of Information and Broadcasting.

They have to provide details of the company, entity and its shareholding pattern along with the names and addresses of its Directors and shareholders.

The names and address of Promoters and Significant Beneficial Owners, Permanent Account Number and the latest audited or unaudited Profit and Loss Statement and Balance Sheet along with the Auditor report.

The Ministry said, entities which, at present, have an equity structure with foreign investment exceeding 26 per cent will give similar details to the Ministry of Information and Broadcasting.

It said, any entity which intends to bring fresh foreign investment in the country has to seek prior approval of the Central Government, through the Foreign Investment Facilitation Portal of DPIIT.

scene. Thus, there is a growing demand for zoom lenses which requires less replacement and capable of shooting high quality video.

In 2019, FUJIFILM released both a standard and telephoto zoom lenses as part of the Premista Series of zoom lenses for high-performance cinema cameras equipped with a Large-Format sensor. The series has been praised by professionals at the frontline of video production for its edge-to-edge sharpness and a wide range of focal lengths for exceptional convenience.

The Premista 19-45mm is a wide-angle zoom lens that offers a constant T-stop of 2.9 across its focal lengths from 19mm to 45mm. Featuring large-diameter aspherical lens elements and a unique zooming system, the lens achieves an astonishing level of edge-to-edge sharpness. Additionally, distortion is effectively reduced even at the widest focal lengths, delivering natural footage with minimal distortion across the entire zoom range.

Furthermore, the use of proprietary optical simulation technology and mechanical design technology enables a compact yet robust lens body measuring 228mm and weighing 3.3kg. The new zoom lens can be utilised for handheld shooting using a Steadicam or high-angle shooting using a crane. Similar to the standard and telephoto zooms, the Premista 19-45mm supports "ZEISS eXtended Data", which can record metadata when shooting, thereby reducing video-editing workload in post-production and facilitating efficient video production.

FUJIFILM has led the cinema industry since its foundation in 1934 to achieve domestic production of photographic and motion picture films in Japan. FUJIFILM will continue to tap into optical, high precision forming and assembling technologies that have been nurtured in the field of cutting-edge video production to develop a wide range of lenses, thereby addressing diverse needs.

Evertz acquires Studer from Harman

Canadian broadcast equipment company Evertz Technologies Limited is purchasing the legacy recording/broadcast studio gear brand Studer from Harman Professional Solutions. The deal, arranged for an undisclosed amount, sees the brand and all related assets and technology move to Evertz.

Studer has played a vital role in the development of recording technology over the years. First formed in Zürich, Switzerland by namesake Willi Studer in 1948, the company quickly gained notoriety for its tape machines, which went on to be used around the world in countless recording studios during the analog tape era.

Studer sold his company in 1990 to Motor-Columbus AG, which in turn sold the various Studer brands to Harman International in 1994. In the years that followed, Studer began producing broadcast consoles, including the long-running Vista line, and Harman eventually merged many of Studer's operations with its other console brand, Soundcraft. While the heart of the Studer brand remained in Switzerland for decades, Harman ultimately shuttered the brand's Swiss-based R&D and management offices in 2018 as part of the global restructuring of Harman Pro brands around international centers of excellence. That move came after Harman itself was acquired by Samsung in 2016.

Evertz says it plans to invest in Studer, aiding the brand's development of "next-generation products" with an eye towards building synergies between its current product suite and the Studer product line.

DW & ASTRA PLAN STRATEGY

Deutsche Welle has planned a strategy to expand and it has secured capacity on Astra and this will help it to broadcast in the high definition format, both in Germany and large parts of Europe.

Unlike other broadcasters the German international broadcaster has remained in standard definition.

From December 1, 2020 Deutsche Welle will broadcast unencrypted in HD on 11.778 MHz in DVB-S2.

SES Astra and DW have been working together very successfully since 2012. Their programme offerings reach millions of people in Europe, CIS, Africa and North America every day via five satellites and provide them with independent news and information.

In addition, a long-term partnership for the SES satellites Astra 3B (for Eastern Europe) and SES-5 (for Africa) was concluded in June of this year. It means DW English can also be seen in HD quality in these regions.

In a statement, Brian Campbell, EVP Business Development at Evertz, noted, "We're pleased to welcome this iconic audio brand to our Evertz family of products and solutions that has been serving the broadcast market for more than 50 years. We also welcome the many valued Studer customers who depend on Studer technology and reliability to deliver the best audio to their audience."

Dolby's Technological Innovations Powered Dream11 IPL 2020

Dolby Laboratories, Inc. a company with decades of expertise in delivering breakthrough audio & visual experiences to billions of people worldwide, worked closely with Star India, to deliver enhanced audio experiences for its broadcast and digital platform during Dream11 IPL 2020.

The ongoing pandemic has brought about many changes to the world of live broadcast. Live sport events around the world, like Dream11 IPL 2020, have been held without audiences and the lack of attendees has required many innovative approaches across the industry. The sports production team at Star India, used the Dolby On app extensively through Dream11 IPL to remotely record voice-overs and reactions from commentators and fans to replicate a stadium-like experience for viewers at home.

In parallel, Dolby has been working with Star India for over a decade to help create & deliver spectacular broadcast experiences that leverage Dolby's end-to-end production and delivery workflow powered by Dolby Audio. This long-etched relationship has grown further with the implementation of enhanced audio technologies across the chain, starting with on-ground and studio production workflows that delivered superior viewer experiences during the recently concluded Dream11 IPL 2020. Through Dolby On and Dolby Audio, Star India was able to create an engaging fan experience that brought the thrill of a live stadium to the comfort of viewers' homes.

Commenting on this deep relationship, Pankaj Kedia, Managing Director, Emerging Markets, Dolby Laboratories, said, "We have been working closely with Star India for over a decade. It has been a fantastic experience to first usher in the HD revolution in 2011 with Dolby Audio, followed by delivering a live cricket broadcast in Dolby Audio and many others. We are excited to be working with the very talented team to explore & deliver enhanced audio experiences to Star India's viewers".

For Dream11 IPL 2020, Dolby also carried out a complete assessment of the Stadiums, Pre-production, Post-Production, Audio Production, and transmission chain for live and post-produced content. The assessment involved studying the entire audio workflow from its origin at the ground, through the Audio Mixing tables to transmission and editing stations, playout, and final delivery. Some of the audio processes and workflows were redesigned to better synergize audio from various sources like live matches, on-air promos, and advertising content was optimized for native as well as enhanced 5.1 viewing experience, to ensure that the final audio delivered to the consumer was consistent and maintained a uniform loudness level & clarity regardless of its origin. Extensive audio training modules were designed and delivered to production and technical staff to ensure that they were fully equipped with the knowledge to handle the complexities of live sports broadcasting especially during the Dream11 IPL 2020.

NBA Allegation of BARC Manipulating Viewership Rating of Republic TV

NBA is shocked to see hundreds of WhatsApp messages that have been exchanged between BARC India's former CEO – Mr Partho Dasgupta and Mr Arnab Goswami, Managing Director ARG Outlier Media Pvt. Ltd. These messages clearly establish collusion between the two in manipulating ratings to garner greater viewership numbers for Republic TV month after month by fraudulently manually reducing ratings of other channels to give Republic TV an unfair advantage. These WhatsApp messages not only reflect manipulation of ratings but is also about power play. The messages exchanged go on to refer to the appointment of Secretaries, Cabinet reshuffle, access to the PMO and the workings of the Ministry of Information and Broadcasting. This only confirms the many and continuous allegations made by NBA in the last 4 years that ratings were being manipulated by a non-NBA member broadcaster in connivance with BARC's top management officials.

NBA demands that IBF membership of Republic TV should be suspended with immediate effect till the case related to manipulation of ratings is pending in the court. NBA Board is also of the view that the manipulation of ratings by Republic TV has immensely damaged the reputation of the broadcast industry and therefore it should be kept out of BARC rating system till final court order.

NBA has already conveyed to BARC that ratings are unreliable as far as we can see and should continue to be suspended in light of the recent revelations which shows the arbitrary nature of functioning at BARC. It shows that there are no checks and balances and the ability of a few within BARC to easily change the ratings as they deemed fit, making the system subjective to the whims and fancy of the management versus being an objective transparent system. The Oversight Committee with no representation of broadcasters and just consultants paid by BARC is an eye wash to show autonomy. NBA strongly demands that action should be taken by BARC against these dubious actors, legal and police action should also be taken against those who are responsible for ruining the credibility of BARC and threaten to damage the credibility of the news broadcast business have hitherto gone about their business without any consequences or fear thereof.

It is indeed with dismay that NBA notes the fact that in spite of having a damning verdict in its possession since July 2020, BARC sat on the forensic report for several months, which brought to light these manipulations. This is a glaring example of the systemic lack of transparency that has prevailed right since the inception of BARC. Not only did BARC not share the data with NBA on grounds of confidentiality, no action was taken against the erring broadcaster, no penalty and no Discom proceedings were initiated. In fact, even after the new management took charge, wide scale manipulation has continued.

NBA's Board demands that BARC:

- Makes a clear statement about the veracity of its ratings in the period during the audit and also conducts an audit of the Hindi news genre.
- Expunge the data of the erring broadcaster and restate the real position of rankings of all news channels from the beginning.
- Explain the concrete steps that have been taken by BARC in the last three months to secure the ratings.
- Bring transparency to the process and create a system whereby any changes to the ratings that impacts the news ecosystem is done only after due consultation with a BARC Sub Committee of NBA nominees.
- Explain what penal actions are provided for in the BARC constitution against broadcasters who have indulged in manipulation of ratings of this magnitude and what action will be taken in the current case.
- Ratings of news channels remain suspended till such time all details of such actions taken by BARC are shared with the stakeholders.

NBA's Board also wants to place on record that the corrupt data released month after month has not only led to reputation loss but has also caused huge financial losses to news broadcasters for which BARC is duty bound to give an explanation. ■

BROADCAST TECHNOLOGY TRENDS IN 2021

AI driven experiences, new cloud deployments, super-aggregation are key tech trends in broadcast sector which will be seen in 2021. All of this will result in consumers getting in the driving seat and industry will see great collaboration to create aggregated content and device experiences.

Consumer behaviour saw dramatic changes in 2020 due to the Covid 19 impact. 2021 will see broadcasters gaining an insight on the behaviour pattern of the consumers and preparing a game plan on how to effectively produce traditional content and also increase on-demand services.

Globally VOD and SVOD accelerated, linear TV viewing was limited. 2020 proved a difficult year for content productions and broadcasters found they had lesser resources, budgets and flexibility to adapt than global streaming platform producers.

Operators are reinventing themselves as content aggregators offering their own linear and VOD assets. And all of them are boosting their capabilities to help consumers discover assets such as podcasts, games, books and related merchandising using a single platform. AI-powered UIs that learn every customer's likes and dislikes will drive a new generation of ultra-dynamic, highly personalised user experiences

In 2021 there will be more than one billion smart TVs installed worldwide, as we

continue to move towards a world where consumers are more reliant on TV delivered over the internet. Having an installed base of TVs with built-in smart functionality is the new entertainment battleground for vendors. It's currently being contested by LG with WebOS and Samsung with Tizen, as well as Android TV, which is being adopted by many brands at a low cost, high quality interface, with some degree of customisation and personalisation.

This has opened up the market for media streamers like Google Chromecast, Amazon Firestick and Apple TV box to improve the user experience. We expect that the installed base of media streamers will increase worldwide to nearly 300 million by 2024.

Furthermore, the key companies selling media streaming devices are also selling access to an entertainment ecosystem, which aggregates content services, takes payment for media content, and integrates effectively with smart home technology. These platforms, including the likes of Google, Apple and Amazon, have a significant impact on how today's consumer communicates, shops and enjoys leisure time.

A TV is therefore no longer a siloed entertainment device and must at least work with these operating systems. The seamless ability to connect with the OS of choice for a consumer is fast becoming an important reason to choose one brand of TV or accessory over another, representing the next frontier of competition."

The technology priorities list for leaders in media has included a move to the cloud for some time now, but where that item fell on the list varied widely. Media and technology professionals often found the time to move their infrastructure to the cloud in between their day-to-day responsibilities.

This year, the pandemic shifted priorities demanding a fast move to the cloud. This means that technology leaders in 2021 will continue to focus on creating efficiencies. Many are looking to what is known as the sharing economy as a means for this needed boost in productivity.

Challenges for which standards can provide a solution involve cloud and multi-cloud infrastructure. In parallel, microservices-based software architecture for media systems will gain traction. Both developments fuel the possibility of a shared economy and SMPTE and its members are prepared to bring order to these exciting, and at times chaotic, new technology advancements.

AI/ML is a huge business today with applications on the industrial enterprise sector. The most deployed use of AI/ML is for video analytics to enhance metadata generation and improve what is otherwise a very manual process.

We're unlikely to see 8K streaming in 2021. We are still in early adoption of 4K. On a mobile device there's barely a reason to stream 8K since you can't tell the difference between that and the image quality of HD let alone 4K signal. Device manufacturers and encoding partners are working to build out 8K media. ■

RAHUL PURAV

FUTUREWORKS DELIVERS QUALITY REMOTE COLOUR GRADING FOR AMAZON PRIME'S TANDAV WEB SERIES

Remote Production is increasingly becoming prevalent in the post-production business. Tandav, an Amazon web series relied on FutureWorks Media to deliver remote production. Rahul Purav, Senior Colourist & Director of Imaging at FutureWorks Media Ltd and the team of artists delivered the colour grading for Tandav using FilmLight's Baselight grading software and the monitoring was done using Dolby PRM 4200 monitor.

Tandav is an Indian web series on Amazon Prime Video, directed by Ali Abbas Zafar. Saif Ali Khan portrays the role of a powerful politician in the series that started streaming from 15 January 2021 on Amazon Prime Video. This nine-episode series features Sunil Grover, Tigmanshu Dhulia, Dimple Kapadia, Mohammed Zeeshan Ayyub, Dino Morea, and Anup Soni.

Rahul Purav, Senior Colourist & Director of Imaging at Future Works Media Ltd shares his insight on the challenges he faced on the colour grading Tandav and how he executed a seamless look for the whole series. "It was a challenging project with a specific teal and orange palette, travelling through elegant palaces down to the rustic dark neighbourhood exposing various environments and situations. Tandav depicts a strong visual language directed by Ali Abbas Zafar and captured by Karol Stadnik.

One of the most notable feature of this project was that the entire grading was done remotely... Karol was in Warsaw and Ali was in his hometown. We could only achieve this with a carefully crafted and aligned visual workflow. We were interacting live during the grading session... It's certainly a milestone achieved where the DOP and Director never came to the studio for approvals. Approvals were done remotely for the entire season. The grading was done using FilmLight's Baselight colour grading software and monitored on Dolby Professional Reference Monitor - PRM 4200 series. The colour grading was done at FutureWorks Media Ltd."

Leading global content creators, studios and OTT's rely on FutureWorks expert artists and technologists to deliver world class services. FutureWorks is a leader in end to end film production, from visual effects and picture-sound post production, to the supply of high precision cameras and lenses. With a dedicated team of over 300 talented artists, spread across multiple integrated facilities in India, FutureWorks is recognised as a trusted partner by platforms worldwide.

Talking about delivering the entire season working remotely, Colorist Rahul Purav shared, "Adapting to these new processes and workflows is certainly going to be the 'new normal' in the post production business."

Accolades to the entire FutureWorks Post-Production, Sound, Camera & VFX teams for their support in midst of this pandemic. Amazing teamwork! ■

THE FUTURE OF PRODUCTION IN THE AGE OF MEDIA CHOICE

Introduction

It is easy to regurgitate the same message about how the TV industry is going through a massive period of change. It is a theme that has been well covered and generally agreed. However, the less acknowledged fact is that the TV production world has struggled to keep pace with the intertwined drivers of technological advancement and evolving consumer behavior. Granted, there has been significant innovation, especially over the last decade with the move towards IP and software-defined systems, but the fundamental processes for many top-tier broadcasters are broadly the same as they were in the TV golden era of the 1960s and '70s.

The foundations of the TV industry were built on successful engineering: the development of a consistently reliable platform to enable creativity and ultimately deliver a sustainable business model. In 1969, NASA put a man on the moon, and the TV industry was there to show the world. Engineering excellence in broadcasting has marched in lockstep with technology right up to the internet revolution – which has proven the biggest disruptor event in our industry's hundred-year history. Innovation has been at the industry's very core – as long as it has not put the business model at risk.

The industry has reached a point, however, where bolder innovations are necessary to keep up with rapid fragmentation. We are seeing more platforms, devices, markets, audiences, and versions of content than at any point in media history. It's not the volume of content that is transforming the marketplace but the sheer variety being demanded – and met. We live in the age of media choice and it is making the complexity of producing programs of all types – especially live TV – more challenging than ever. The COVID-19 crisis and lockdown have massively accelerated this process. Content producers have had to set aside familiar ways of doing things – once seen by many in the industry as sacred cows – to ensure safety, social distancing and greater cost efficiency in the face of ongoing economic uncertainty.

Underlying market challenges

To put into context just how dramatically the industry has shifted – and its likely direction – you can look at three sets of statistics:

1) Fragmentation: In 1985, five years before commercial internet services, the three largest TV networks in the United States accounted for 45% of American household audiences in primetime. By 2009, the share of the big four – even with the addition of Fox – had dropped to barely 30%. Based on Nielsen data, in primetime the big four linear broadcasters have a combined single-digit share of total potential TV viewers today. The fact is traditional linear TV is no longer the unquestionable dominant medium, so broadcasters must learn new creation and delivery methods to thrive in the more diversified media landscape.

2) Revenue decline: In 1965, the big three networks commanded around $50,000 for a "primetime minute" of TV advertising. Adjusted for inflation, this equates to around $440,000 in today's money. In 2019, the average national 30-second US TV spot-ad cost $115,000 – a drop of roughly half for a minute of advertising. At a time when a recent survey found that 60% of viewers download or record shows so they can skip commercials, the historic monetization model of traditional live TV is facing an existential threat.

3) Escalation in production costs: In 1973, the average daytime TV soap opera in the US, such as the 'Young and the Restless' or the 'Days of our Lives,' cost around $60,000 a week to produce – or the equivalent of $360,000 today. In 2010 a 'Days of our Lives' producer disclosed that the show cost $750,000 a week to make (the 2020 equivalent of nearly $900,000 per week). With daily soap operas seen as the most cost-conscious end of the production spectrum, it is clear that controlling production costs for programs of all types is fundamental to the continued success of broadcasters – and also their online competitors.

Shifting demand and rising costs

The 'Days of our Lives' stat is particularly noteworthy. The fact that the longest continuously running show

in the US produces five episodes of scripted drama a week for less than a million dollars – compared to the $6 million-an-episode price tag for the admittedly more complex and cinematic 'Game of Thrones' – is a testament to the efficiency of its production process. The trouble is not every production will be that streamlined – and for many primetime programs, the quality required is at an entirely different level.

Indeed, in other areas of TV production, costs have seen much more significant rises – even as technology has attempted to aid in reducing costs. Gameshows, dramas and documentaries have each seen a cost increase alongside a viewership decline and corresponding ad revenue erosion, as fragmentation has given viewers and advertisers alike more options than ever. One bright spot is live sports – which for many broadcasters has been the anchor for their sustainability for several decades. Although production costs have gone up, so have the production values. And there are still significant events and major paydays: take the Super Bowl, where a 30-second ad spot can command as much as $5 million – or more than 40 times the typical US average.

Many of these statistics reference the US market. However, the same trends are mirrored across the globe – and even more magnified in some markets. In Japan, for example, primetime linear TV viewing rose to more than 71% of households before the millennium – a figure that has since slid below 60% and is declining rapidly. In the UK, the average amount of broadcast TV watched has fallen by 25% over the last eight years and among 16-24-year-olds, it has dropped by a whopping 50%.

The counterpoint to this slightly gloomy outlook is that overall viewing has risen. In response, we as an industry are producing more video content than at any point in history across a significantly broader and growing range of distribution platforms. The audiences are not as big, but there are more of them – with overall video content consumption across both TV and digital combined rising by 6.6% between 2014 and 2019, according to eMarketer research. Entertainment industry analyst Variety Business Intelligence estimates that, in 2002, there were 138 movies and TV shows produced by the US TV industry. By 2019, that number had reached 1,178 – a figure eclipsed in India, where TV and film productions have passed the 2,000 mark.

Specialty programs are finding their niche on subscriptionbased over-the-top (OTT) services with very targeted audiences. Alternative and smaller sports and events that once

struggled to get on TV because they could not deliver the mass audiences the major TV networks demanded in their glory days are now finding themselves in demand – often globally. Throughout the world, broadcasters and streaming services are dramatically ramping up their content production along with the price they will pay for rights – and the content owners are more than happy to adjust their rates accordingly.

Across the globe, the media industry is seeing several powerful, interconnected dynamics at work. Falling viewership on traditional TV, combined with rising consumption of on-demand content, means that many giants of the TV world have needed to rethink their business model. This has led to some owners of national broadcasters shifting their strategy to become more video-on-demand (VoD) centric – as we have seen with the introduction of services such as CBS All Access, Pluto TV, and Disney+. At the same time, these owners have looked for ways to offset stagnant or lower advertising revenue.

Despite the changes the industry has seen in the last decade, production costs have remained high – or in some cases have continued to rise. When it comes to producing TV content, yield per asset – which has dramatically come down amid the on-demand and online streaming revolution – has become an area of intense focus for forward-looking media organizations. As a result, reaching new levels of production efficiency – and flexibility – is rapidly becoming the name of the game today.

The evolution of production technology and processes

The challenge of rising production costs is, in part, due to the need to deliver content across many more platforms than traditional linear broadcast. Production must now scale vertically and horizontally across formats, versions, language, device types, and platforms to meet an increasingly diverse audience footprint. However, there is no quick fix for rising production costs, and revenues are certainly not increasing to counteract the additional expense.

Some may argue that throwing everything into the cloud is the solution. Remote production via the cloud has many advantages, including more flexibility and the ability to scale up (and down) quickly within an OPEX model. However, it is still technically unfeasible for specific use cases. It is also not always financially sensible when considering that the existing investment made in broadcast TV technology runs into the hundreds of billions – and many broadcasters can sweat these assets for a significant amount of time. Besides, certain processes are still more efficient, faster, cheaper, and more reliable via local, highly specialized hardware.

Some may suggest that traditional TV is dead and that OTT/VoD is the future. It may be at some point, but the average US person still watches more than four hours of linear and timeshifted broadcast TV every day – within the nearly six hours of total daily video viewing. Live sports and news, plus mass-media events, such as World Cups, Oscars, Royal Weddings, Super Bowls, elections, and culturally transcendent TV moments (e.g. Game of Thrones final episode simulcast to tens of millions of viewers across 170 countries) are shared experiences that are now often worldwide in scale. TV still accounts for one-third of the global ad spending and is worth $166bn annually. Although wounded by streaming and social media, broadcast TV is very much alive and kicking.

Inside the factory

Part of the solution to the rising costs and complexity of modern TV production can be found in lessons learned from other industries, especially manufacturing. Although TV puts a lot more creativity into an intangible 'product', content production shares some of a factory's traits – from the automotive industry, for instance. As it has evolved, the auto sector has seen periods of major competitive disruption that have forced companies to embrace methods that allow workers to produce both a greater variety and quantity of vehicles with fewer staff. Take General Motors (GM), today a top-five car brand globally that in the 1970s was the world's largest private company, employing nearly 350,000 staff in North

America and producing roughly three million cars each year. After reinventing itself at several points, today GM makes approximately 7.7 million cars while only employing 164,000 staff, even as the number of models has grown considerably – along with far greater factory customization options.

Over the intervening years, GM, in common with the wider manufacturing world, has adopted more lean production methods, automated its factories, and used advanced software to streamline its production workflow through design, logistics, quality and test, and many other areas. Similar trends are happening across a broad range of manufacturing sectors as business leaders strive to deliver products faster, with broader choice, and for a lower cost.

More with less

The parallels with TV production are clear, as broadcasters strive to meet consumer demands for greater immediacy, choice, and quality. We see examples of the drive to do more with less in live sports events. Take, for instance, the FIS Alpine World Ski Championships, the largest winter sports event outside of the Winter Olympics. Traditionally, SVT, the Swedish National Broadcaster, would need to build a complete production "factory" at the ski resort town of Åre to cover the 12-day event. However, for the 2019 Championships, SVT leveraged extensive remote production capabilities instead, with up to 80 camera positions and a largely IP-based workflow across video, audio and data — transmitted to SVT's production facility in Stockholm, over 600 km away, for production and playout.

Broadcasters such as SVT are not alone. Across the industry, we see an ongoing shift towards technologies and workflows that are designed to enable more remote production and achieve more while limiting or even reducing costs. This shift includes the widespread adoption of IP as a greater flexible and scalable replacement for SDI and more use of software rather than dedicated hardware to not only reduce cost but to enable more automation.

Charting the right direction

To understand why this shift is so vital requires a candid view of where we are as an industry and where we are going. The way viewers – particularly those in younger demographic groups – mix and match platforms and devices is having a fundamental impact on production needs and will continue to do so. Fragmentation and demand for choice will also drive change, with remote production supported by cloud technologies playing an increasingly important role.

Beyond the Golden Age

The architecture that was designed for the pioneers of TV of the 1960s was built for mass market linear broadcast. And it does the job to incredible levels of resiliency.

Engineers built production centers that can scale to provide live coverage of vast and complex events

Enabling record breaking innovation

Grass Valley's unique DirectIP capability was central to SVT's workflow for the 2019 FIS Alpine World Ski Championships, enabling the XCU base stations to be situated in the central equipment room in Stockholm, while the cameras were in the snowy hills of Åre. DirectIP hugely simplifies the interconnections that need to be made, allowing all the camera signals to connect straight into the XCU. This enabled the shaders to match the cameras, without any delay – with fewer people traveling and instead working in the comfort of a Stockholm master control room.

This hybrid workflow also allowed SVT to leverage Grass Valley hardware assets it already had at its Stockholm facility, including SDI routers, multiviewers, and signal processors, to deliver a high-quality production while reducing costs. In total, SVT delivered content from 60 remote cameras simultaneously: setting a record for the largest ever remotely produced event. Over the 12 days of the competition, SVT transferred over 8,000 TB of data and roughly 10,000 hours of HD video without failure.

The future: a journey, not a destination

Grass Valley's position in the TV industry – six decades of building relationships with over 4,000 broadcasters across 230 countries – gives us a unique insight into the media industry. We see the future of production not as a destination but an ongoing journey.

On the technology side, we see software, IP, cloud, managed services, virtualization, commodity, and bespoke hardware – even artificial intelligence – all forming part of the direction of travel for broadcasters and other content creators.

However, when we talk to media technology business leaders regularly through our GVX customer council and other forums where we engage with clients, they all convey that they are at different stages in their journey. And most are proposing different routes that suit their business model, country dynamic, and overarching strategic vision.

Those outside of the world of TV may assume a uniform picture between broadcasters, but when you look deeper, it becomes abundantly clear that almost every organization is moving along a unique trajectory. Any "solution" that aims to improve production efficiency must have the flexibility to adapt to each organization's own tempo and this realization is at the heart of the GV Media Universe philosophy.

The GV Media Universe is an ecosystem that recognizes the trends and challenges faced by the industry and strives toward a future where much of the physical plant that exists today – like that within a studio or OB truck – could be offered as a software equivalent.

At the heart of the Media Universe ecosystem is our cloudbased Agile Media Processing Platform (GV AMPP), where we are creating a family of virtualized applications including multiviewers, router panels, test-signal generators, switchers, graphics renderers, clip players, and audio mixers and processors. All of these virtualized applications can be deployed quickly to support a wide range of workflows. Built on a microservices architecture based on five core technologies — fabric, timing, connectivity, identity, and streaming — GV AMPP enables elastic media services and directly addresses many of the issues that complicate common IP and cloud deployments. GV AMPP delivers seamless network connectivity, timing and ultra-low latency, with the overriding goal of "doing more with less".

like the Olympics or national elections. Outside broadcasting (OB) workflows bring live sport into the living room with visceral impact. Contributors power 24-hour news coverage by feeding live from across the globe via satellite – instantly.

All these engineering feats are as valuable today as they were decades ago. However, many are overkill or unnecessary for producing reality TV and complementary content around events, which now accounts for a significant proportion of TV programming. In an era where more people are watching the top 100 YouTubers than the entire primetime TV line-up, media industry players must look to realign production resources to match monetization and viewership.

Broadcaster diversity

It is crucial to keep in mind, however, that each broadcaster or content producer is at a different point and dealing with its own unique circumstances. At one extreme are national broadcasters such as PBS and the BBC, which must maintain an extensive live news broadcasting capability but, in some cases, limited scope to generate additional revenue due to their public service charters or state-funded status. In the middle are independent TV broadcasters, such as Canal+, ITV, and Globo, which rely on advertising revenue to thrive in a highly competitive market. Many are now exploring multiplatform distribution, including subscription video on demand, while balancing lower advertising revenue. Further along the spectrum are multichannel video programming distributors (MVPDs) such as Comcast, DirecTV, and Sky, which own cable and satellite delivery and have also built significant content offerings – with live sports across multiplatform as a major driver.

At the far end are the specialists that focus purely on

distributed and OTT live sports content, such as DAZN and BEIN, with a focus on multiplatform and direct to consumer business model. With a major investment in rights, production costs need to be trimmed to deliver profitability. Joining this group are major sports brands such as NFL, NBA, Indian Premier League Cricket and Formula E, which are all exploring direct to consumer subscription OTT options. These innovators vary from those with very traditional, broadcaster-centric infrastructure to a few that have embraced a largely managed services provider model with little hands-on involvement.

These are just a few archetypes. If you can think of a combination of different audience segment, distribution and monetization approaches, there is probably a media organization testing that model somewhere in the world. However, they are all embracing IP, software, automation, and remote production to create more content, faster, and at a lower cost per hour.

Benefits of a production innovation

We must, nonetheless, recognize that broadcasters and other content producers still face an engineering challenge. Content production at its most basic equates to: we film it, we edit it, we deliver it. It sounds simple but finding ways to carry out these tasks more efficiently and, potentially, for less CAPEX and/or OPEX, requires shifting the technology stack towards a more software-centric position.

At a fundamental level, traditional TV technology has been built around integrating discrete and highly bespoke hardware elements – and, more recently, software parts – to accommodate a specific workflow. Several common standards, such as SDI and ASI, have acted as the glue,

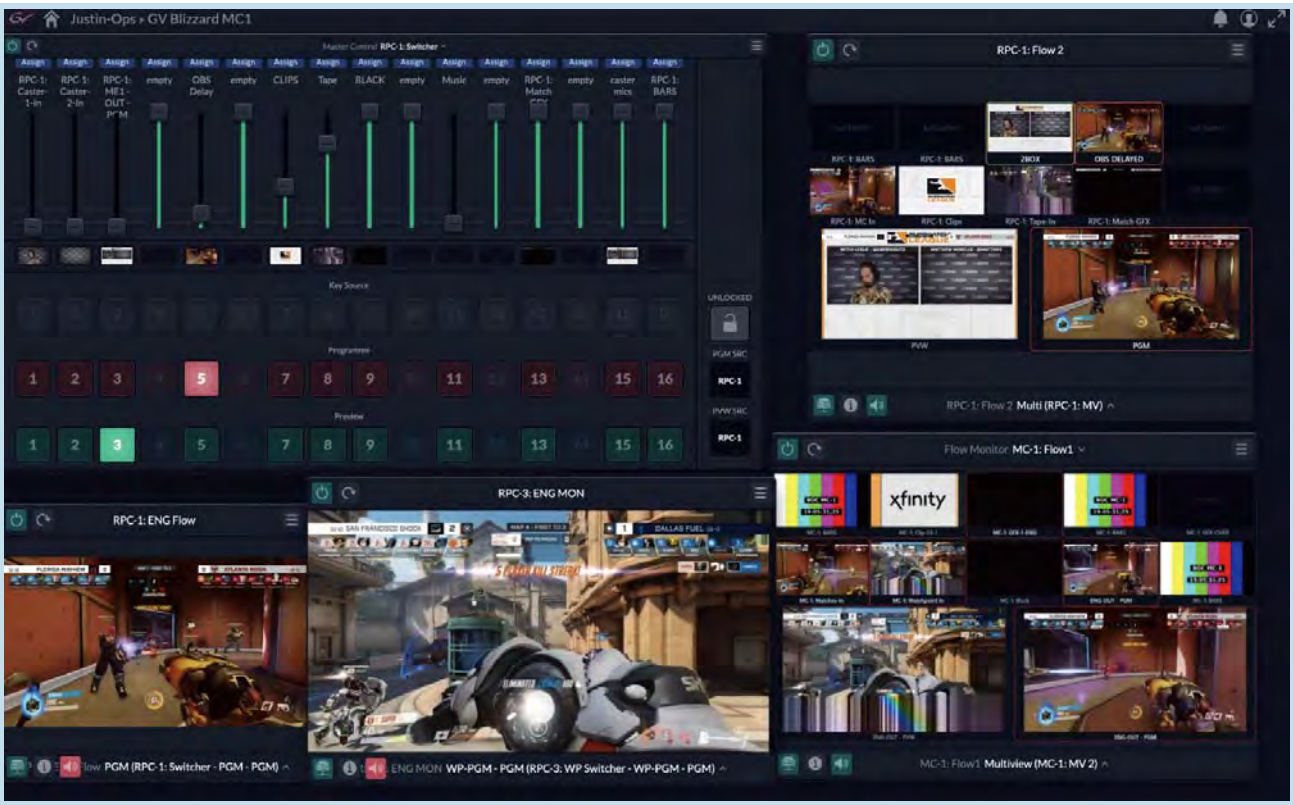
and the focus has been on absolute reliability and peak scale. The need to deliver more channels or increases in quality requirements, such as the transition to HD and UHD, has helped prompt each refresh cycle. The rationale for this approach was that bespoke hardware offered a guaranteed level of performance and suited the CAPEX heavy buy-cycle that broadcasters are traditionally geared around.

Software evolution

At the heart of all these hardware elements, however, is embedded software. And as technology has progressed, the computational power of COTS servers within cloudbased environments that utilize virtualization offers a viable alternative geared towards an on-demand and OPEX focused model. What's more, as the consumer has embraced on-demand content, so has TV technology – and many of the broadcast functions that were only really viable as highly specialized hardware can now be delivered as software-only implementation. The first wave initially provided these from on-premise appliances, but as global IP WAN connectivity has grown, the cloud now offers reliable delivery for many of these production use cases.

The production to playout workflow has tens of potential elements within its scope, along with many dependencies. But the benefits of a software-centric and cloud approach can be highlighted by looking at just a single example – and showing how the transition delivers a tangible set of benefits: Master control (MC), which is the technical hub of a broadcast operation. A master control room (MCR) is used to switch between feeds coming from different production control rooms (PCRs) and other pieces of content, such as clips and commercials. Moreover, master control's function may also include the insertion of other branding elements, such as logos and lower thirds, and the regionalization of content.

At the heart of the MCR are hardware elements such as our Masterpiece 12G-SDI master control switcher. Based on a 10x 12G-SDI inputs for single link UHD connectivity plus 40x 1080p/1080i/720p inputs, the unit works across multiple formats, includes flexible audio capabilities, channel branding, and multichannel video program distribution, as well as dynamic visual effects. Masterpiece units are highly regarded platforms, installed at thousands of locations around the world. However, organizations that have already moved to an IP-centric workflow can leverage many of the capabilities offered by a Masterpiece powered MCR cloud-based platform.



Blizzard: Master control in the cloud

An early adopter of this cloud MCR innovation is Blizzard Entertainment, an American video game developer and publisher that is also a broadcaster of global professional esports tournaments for the Overwatch League (OWL) and the Call of Duty League (CDL). Due to COVID health concerns, in March of 2020, Blizzard decided it needed to produce its broadcasts in an entirely remote fashion. All necessary production and master control functions were virtualized via GV AMPP Master Control, allowing the entire production crew to manage these events from home, without any physical switchers or audio consoles.

IP camera feeds from the on-screen talent and the in-game video were sent straight to the cloud, where the production was performed for every match-up using GV AMPP for distributed remote production. Then, GV AMPP Master Control was used for master control switching and regionalization to English, French, Korean, and Chinese, with each broadcast containing localized commercials, branding and graphics. The job roles for Blizzard's at-home productions were the same as onsite with a truck, with one major difference: a single producer would take on the roles of director, producer, and technical director, as well as monitoring the audio levels within the GV AMPP interface. Each OWL and CDL production also featured one or two graphics operators, one or two replay operators, and an operator for the clip player (for playback of music or video clips). There was also a six-person observer team (five observers and one in-game director), along with casters and talent. Blizzard used GV AMPP for OWL matches in North America and Asia, and the operation ran around the clock.

The Blizzard use case provides an example of a new type of production model, and the master control is just one element of a radical shift. With the GV AMPP Master Control application, any customers can create configurable virtual master control rooms, accessible via a web-based interface from anywhere in the world. GV AMPP meters usage, and each tool — switcher, audio mixer, multi-viewer, clip player — has a different metered rate associated with it. Broadcasters are charged only for the features activated and the amount of time each element is used. They utilize the resources they need and then incur no further costs. When an event is over, the user can take a snapshot of the configuration, thus retaining the ability to recall it before the next event.

Final thoughts

Production is heading towards a future where flexibility and efficiency will be as crucial as reliability. The option to change workflows, utilize on-demand resources, and move between OPEX and CAPEX business models will become essential options for both traditional broadcasters and new entrants to the market.

While the trend to remote production was already well underway among leading broadcasters, the coronavirus crisis has acted as a catalyst for employing technologies that enable it. There are technical challenges such as managing latency and timing, and delivering the orchestration needed to allow the physical world of studio facilities and OB trucks to merge with the ethereal world of a software-centric production model. Innovators such as Grass Valley are working within AIMS and SMPTE to ensure standards are adopted as required. These collaborations have aided industry-wide efforts to standardize the SMPTE ST2110 Suite, and the same spirit has fueled Grass Valley's development of the cloud-based AMPP platform.

The outcome of this evolutionary journey in production will be the emergence of content "factories" that can handle a range of outputs across an array of live events, platforms, and geographies. In key live content areas such as news and less frequent live events such as sports, concerts, awards and elections, traditional broadcasters and newer players alike will look for partners and

ecosystems to help them navigate the complexities of production. The aim for many is to address the fundamental Yield Per Asset issue by creating more content, more efficiently and more cost-effectively – while also achieving greater flexibility.

As a company with deep experience in broadcast technology across both traditional hardware and newer software platforms, Grass Valley is embracing the changing nature of production. Blizzard provides a glimpse of the many projects Grass Valley is working on with major broadcasters, sports leagues and service providers. These companies are all exploring new ways to get more value out of their production workflows, freeing them up to concentrate on developing more creative and engaging programming.

At Grass Valley, we also understand the need for technology partnerships that bring specialist expertise in certain key disciplines to drive success. Our vision is that we and other pioneers will exist within a broad universe of technologies that utilize core open standards along with proprietary systems to ensure that production can transition towards greater efficiency and scale with more options around CAPEX or OPEX. With the demand for content showing no signs of abating, only organizations that are ready to embrace innovation and systems that foster it can hope to thrive, as terms such as "remote production" and "cloud-based production" simply become "production". ■

About the author:

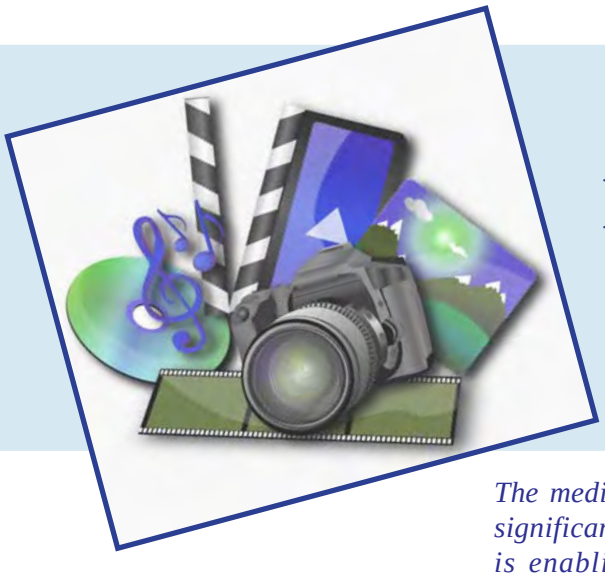
Marco Lopez, General Manager of Live Production

As general manager of live production, Marco oversees all aspects of this critically important segment of the Grass Valley business. He is responsible for accelerating innovation across key strategic areas, such as remote production, IP-connected live workflows and virtualized media workflows as well as content creation solutions, such as cameras, production switchers and replay.

From 2018 to 2019, as CEO at ChyronHego, Marco guided the company's efforts to develop and launch tools that easily capture, search, aggregate, curate, and ultimately visualize live data to improve viewer enjoyment.

Prior to this, following the successful acquisition and integration of Grass Valley with Miranda, Marco held the role of president of Grass Valley from April 2014 to December 2017.

Marco would like to acknowledge the critical input and assistance of Chuck Meyer, technology fellow and Robert Erickson, strategic account manager for venues in the research and writing of this paper.



MEDIA AND ENTERTAINMENT IN INDIA – DIGITALLY EMPOWERED!

The media and entertainment industry in India continues to undergo significant transformation. The rapid proliferation of mobile access is enabling on-demand, anytime-anywhere content consumption nationwide. For global players across the media and entertainment value chain looking for scale and a vibrant growth market, the Indian media and entertainment industry provides an exciting opportunity to reach and engage with digitally empowered consumers.

Mobile leading the platform race

With a population of 1.3 billion, a tele-density approaching 89% of households, 723 million internet subscribers and nearly 400 million smartphone users, India's telecom industry is poised to become the primary platform for content distribution and consumption. Entertainment apps are driving significant consumer engagement — India ranks as one of the fastest-growing app markets globally. The thriving mobile environment in India is creating exciting new avenues for media and entertainment companies to reach a significantly larger addressable market that now extends across the country. To capitalize on this opportunity, industry participants also recognize the importance of finding unique ways to appeal to the diverse Indian consumer base, as well as designing packages and pricing plans for services that align with local demand characteristics.

Local flavor creates a winning edge

India's many regional and local language markets offer exciting growth fundamentals for global and domestic media companies alike. However, to succeed in these regional markets, customization is critical.

Global media companies recognize this imperative and many are already producing their programming in multiple Indian languages to increase reach. Along with localizing content, international streaming service providers are also exploring various pricing options for price sensitive consumers.

Foreign studios are collaborating with Indian companies to co-produce, distribute and market content geared to appeal to distinct Indian audiences. They are releasing trailers in a variety of languages, hiring Bollywood stars to dub local versions as well as to promote content on social media.

We expect localization and the focus on regional markets to be a significant priority for global

media companies in the coming years.

Sports industry gaining steam

The sports segment in India is flourishing with the help of several government initiatives focused on building sporting infrastructure/ facilities and encouraging the development of sporting talent in the country. The segment also offers global media companies with several attractive opportunities for investment, including broadcast rights across platforms, marketing and sponsorship opportunities and investments in sporting franchises. Beyond cricket, other sports leagues including badminton, field hockey and kabaddi are undergoing significant growth and offer relatively new and interesting areas for investment for international companies looking to tap into the Indian sports market.

To underscore the value global media companies see in this segment in India, the battle for sports streaming rights continues to be red hot with global OTT providers and social networks competing with domestic companies for rights to stream live sporting events.

eSports transforming the future of gaming

Though currently nascent, eSports in India is witnessing levels of interest and excitement seen in other markets around the world. A huge millennial fanbase, coupled with the affordability of eSports streaming services and improved internet bandwidth is driving this growth. A range of start-ups have entered the Indian online gaming and eSports space, establishing eSports as an emerging sector for investment. As eSports viewership continues to grow we expect more global interest in this segment.

A conducive regulatory environment for foreign investors

India generally offers a conducive regulatory environment for global investors.

There have been a few recent developments that global companies need to be aware of:

- The Government of India recently introduced the Personal Data Protection Bill which regulates the processing of citizens' personal data by the government, companies incorporated in India and foreign companies dealing with personal data of customers in India. Global companies processing the personal data of Indians will need to ensure they take appropriate steps to comply with the bill
- Separately, the recent budget proposals are likely to reduce the compliance burden for foreign companies earning income through license fees in India. The withholding tax rate for technical fees as well as withholding tax provisions for e-commerce operators are also expected to be reduced
- Finally, for global studios and production houses, the establishment of the Film Facilitation Office to support single window clearance is expected to make India an even more attractive destination for film making

Conclusion

The Indian media and entertainment industry offers a compelling opportunity for global media players looking to tap into a vast, vibrant and diverse market — a market that is now being cast wide open with the rapid proliferation of mobile connectivity and streaming consumption. While the potential upside is significant, the sheer complexity and diversity of the Indian market demands that global players focus on localizing their content and/or services. Whether the chosen strategy is to build, buy or partner, understanding the many nuances of the Indian market is now more crucial than ever before. ■

ALL THINGS DIGITAL

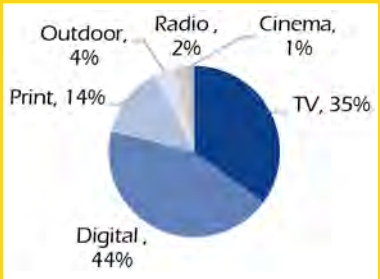
Digital to be the torchbearer for growth in advertising

India's advertising market is estimated to double over the next five years, driven by

1) huge pent-up demand in some sectors (travel, retail & tourism), which were negatively affected during COVID-19,
2) an increase in the number of advertisers (SME-led); as on today, 98% of advertising is held by only 500 advertisers, and
3) a surge in digital advertising led by favorable demographics (better data speed, smartphone penetration & increased time spent).

India's advertising market is estimated to post a CAGR of 16% over the next five years (including COVID base impact), with digital is likely to grow ~25% CAGR during the same period; the share of digital advertising is estimated to double (v/s pre-COVID levels – CY19) toward 44% whereas the share of the largest ad medium today – TV – will largely remain stable. TV advertising may witness a decline within the ad share post CY25, if digital scales up further. Globally, digital advertising accounts for 61% of ad spend whereas TV's 23%, given demographics in India (the big mass market with several languages), we believe the share of mediums like TV and print will remain higher than global average.

Expected ad spend share by FY25E (%)



Source: Elara Securities Estimate Research

Content cost will continue to inch up within digital

The shift toward digital content has led to anytime and anywhere convenience; however, the audience base remains largely different for digital and TV, which is why we have yet to see chord-cutting trends on a larger scale. Content cost on digital will continue to be much higher than TV, as regional content cost may grow sharply, given the entry of global over-the-top (OTT) giants to make large-scale regional content. OTT's prefer web series over paying premium for direct OTT release of a feature film, due to

1) web series being more binge worthy in nature
2) lower per hour content cost while producing a web series vs acquiring a film
3) a more loyal customer base, which has a strong recall for the new season of any particular web series.

Direct digital release of large-scale cinematic films on OTT is a tactical phenomenon and a mere COVID-19 trend (lack of availability of new content until three months ago). Success of one large web series leads to a huge jump in key performance indicators (KPI), subscription video on demand Subscription Video on Demand (SVOD) revenue, ad revenue and consumption dynamics); India's OTT market will remain to be freemium based in the medium term. Content is most important part of an OTT offering to gain Customers; India based broadcaster OTT's have a relatively lower tech cost

vs global counterparts, which spend as high as 18%-20% of the their revenue on tech/user experience.

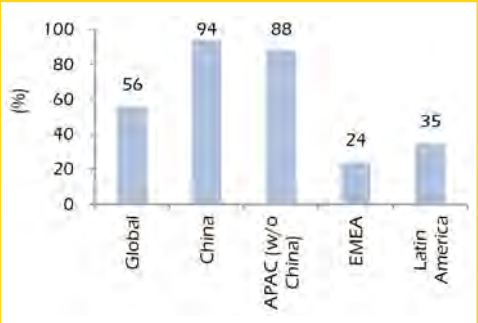
Cinema trends in APAC more favorable than US & UK

Cinema remains an outing and socializing trend in Asian countries, such as Singapore, Taiwan, China, the UAE and India. This means there is relatively low or no threat of OTT, unlike the West (US and UK) wherein consumers visit a cinema only to watch a movie. In terms of screen openings too, APAC has ~88% of screens, which are open vs the US and the EMEA, which have opened up only 38% and 24% of screens until now, respectively; the occupancy cap limitation too has been removed from markets like China and Taiwan. There have been no changes in terms of distributor share arrangement with exhibitors in APAC to date despite the COVID-19 situation; there is also less likelihood of a imultaneous release of a film on OTT and cinema in APAC. The US market has witnessed a change in distributor share and a simultaneous release arrangement as the market is already at a mature stage vs APAC; we do not expect sizeable changes in distributor share, simultaneous OTT release kind of trends to come into India's movie industry.

Broadcaster OTT may struggle without telcos

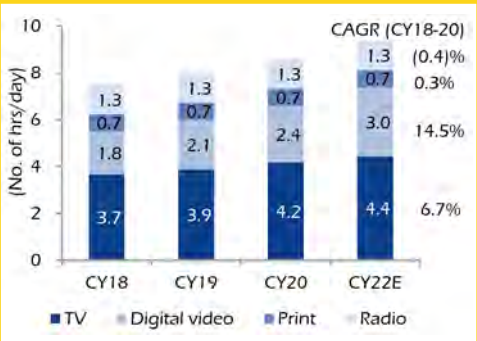
Partnerships with telecom service providers (TSP) will continue to account for a larger chunk of SVOD revenue for broadcaster and other OTT in the near term; smart TV and smartphones too will support growth of India's SVOD ecosystem in the medium term. Consumption of long form content will only be driven by increased wired broadband (fixed line) penetration, which is low in India today at 8.8%; Jio's Fiber To The Home (FTTH) offering will be a key driver for growth in consumption of content, led by enhanced speed offerings. Indian consumers remain to be more value-driven and plans by Jio FTTH will continue to attract customers, given a large pool of content offerings in various plans. TSP will continue to dominate in the OTT partnership ecosystem as the former is highly consolidated vs OTT, which is a highly fragmented market; this will lead to TSP getting a higher revenue share or better bargaining power vs OTT apps. Customer retention for OTT remains to be a challenge unless it develops a large catalogue of quality content offerings over a period of time to ensure it has a large loyal audience base; the shift from B2B to B2C will be the biggest risk for broadcaster-based OTT to scale up.

India digital video has witnessed a strong 14.5% CAGR over CY18-20



Source: BCG CII Big Picture Report, December 2020, Elara Securities Research

% of screens re-open post COVID-19



Source: Gower Street Report, January 2021, Elara Securities Research

Our view on listed firms within the M&E space

We maintain our positive stance on India broadcasters (Zee Entertainment, SUN TV Network and TV Today Network) based on the near to medium term; however, the potential of re-rating on valuation multiple remains limited unless they offer visibility for building a large-scale digital business. Among these names, we believe TVT and Z have been able to create some initial success on digital; however, it is not good enough for enabling a big rerating.

Concerns for broadcasters persist:

1) distribution of content over digital – overdependence on a highly consolidated telco industry & aggregators,
2) an inability to extract a large share in the digital advertising segment, which is still dominated by social media and sports,
3) continued investments in digital content, which is a risky proposition, in our view, given the competition with global OTT giants,
4) change in any regulations (tariff order & censorship on digital), which will further impact business negatively, and
5) converging growth rates in the advertising segment and threat of shift in ad spend, from TV to digital post CY24.

We estimate ad growth of 7-8% YoY for broadcasters post FY22 after the COVID base normalizes; there may be some form of upside, which we will monitor on a medium-term basis. ■

CONTENT – RISE OF ON-DEMAND MODELS

Content is the same everywhere. On digital, content can be created segment-wise in different genres. However, the budget will be similar across genres, content and segments. With digital, there is convenience with skipping, choosing shows, anywhere and anytime.

In India, around 40 OTT platforms are currently streaming content, especially SVOD; however, original content is key to gain subscriber base.

Every platform has its own journey. Alt Balaji has been SVOD since the beginning and hence driven by originals only rather than acquiring movies. Once the audience comes via originals, it is a more sticky and loyal audience. Once the show clicks in the first season, the initial audience and the buzz it created via season 1 comes up for the Season 2, which enables organic growth of subscriber base for the OTT platform.

In India, around 10mn audience have cut chords during COVID-19 lockdown, choosing OTT platforms largely due to a variety of content. The key remains to keep up the engagement of audiences on the OTT platform. TV and OTT can coexist at least for the next 8-10 years.

Earlier men used to explore OTT content while women had TV's daily soap preferences; however, this trend has changed during COVID-19 where the family viewing has grown significantly

On Sony LIV, Scam 1992 followed India vs Australia series; thus, there was significant buzz throughout Q3FY21, gaining subscribers for the SVOD model.

In a usual production of OTT content, feature film duration is 2.0-2.5 hours while web series is for eight hours. Hence, each episode is treated as a feature film and the sequel is the next episode & the Finale is based on which budgets are decided.

Regional is the next big thing on the OTT platform and SunNXT has huge Tamil Film catalogue, which can do well in South India, given the OTT investment plan of SUNTV over the next two years. South India has been ahead of North India in terms of TV consumption.

South India has started to embrace OTT platforms; hence, INR 1.5bn spend for regional OTT content. TV viewership is continuing to well to coexist with OTT for the next 5-10 years. However, TV content needs some innovation from old same type of content.

Post July, global OTT platforms have started to feature Tamil and Telugu films. Also, with uncertainty of theatre reopening, these producers have started to move OTT platforms for negotiations as they are unable to sit on a huge working capital blockage. Big films, such as Drishyam 2 were released directly on OTT as well as Surya, which was a big hit in theatres. Zee5 has been active in Tamil and Telugu content.

Amazon Prime had entered the COVID-19 phase with a big budget of ~INR 10bn for content recently, but instead of web content, only movies are being bought. Web series is focused on regional platforms like Zee5 while global OTT is not going the web series way

TV budgets cannot match digital OTT budgets, as they remain at ~INR 0.25-0.03mn per episode vs INR 5-10mn per episode or higher on OTT platforms. Production house is paid at a mere 10% as fee, but is not adequate for making quality content.

Budget per episode on OTT platforms is inching up to INR 10mn per /episode, but this will depend on the legacy and creative vision of producer. Also, OTT conviction remains key for budgets being sanctioned

Alt Balaji solely works on web series, and even movies broken down into episodes to create a web series. It has been buying content, which is syndicated, but all decisions are based on ROI.

OTT platforms are divided into

1) broadcast OTT (Zee5, SonyLiv and Hotstar) which have the advantage of catchup content, sports and originals
2) international firms (Netflix and Amazon),
3) telcos & aggregator OTT platforms, and
4) others,

which require focus on originals, as excitement is about web series; hence, changes of saturation are low

Direct release of films to OTT is a tactical play while OTT will continue to focus on web series content.

The freemium platform works in favor of SVOD models whereby the first episode is free, and post that it is via subscription. This has helped create a subscriber base. Scam 1992 has given 5x jump on all business KPI for Sony LIV, which has built in positivity for entering the new year with only six originals in FY21, but FY22 shows the pipeline is huge.

Sony LIV will be launching in South India by the end of CY21. Euro 2021, Olympics and India Tour are coming up backed by which Sony LIV will be formidable in the OTT space.

Regulation would have a negative impact on OTT platforms; hence, it is better served if self-regulated. Clean entertainment cannot continue forever, given what the younger generation needs. Youth wants dark and real stuff so regulation can cap creativity.

VOD is video on demand i.e. consumer choice has to be primary. Hence, regulations can impact this basic intent of SVOD where consumers are paying to watch on-demand shows. ■

TV ADVERTISING: EMERGING TRENDS ACROSS MEDIA

Broader advertising trends within the TV vertical indicate a good recovery, backed by IPL after a big blow during COVID-19 lockdown.

Currently, ad spend stands in good stead after a K-shaped recovery with some new ad verticals coming up while some old ones are drying up.

During the COVID-19 lockdown, TV had become an essential service for every household, witnessing record viewership for all channels; however, on the other hand, the advertising spend took a hit.

Revenue has dropped across verticals except digital by ~60% average, but 40% was sticky & consistent, largely backed by FMCG firms. People had been stocking up all types of necessities; hence, ad verticals like personal hygiene, home appliances, eCommerce, hand sanitizers, tech companies and online education & gaming saw aggressive spending.

On the other side, the travel & tourism space saw a sharp cut, due to the lockdown hit prevailing even post the unlock. Hospitality remains under pressure, due to lack of consumer confidence.

Within the FMCG basket, Amul and Dabur saw 100% growth in ad spend as some FMCG firms came to advertise on the news genre, which was not the case earlier due to preference for general entertainment channels (GEC) and viewership patterns. Dabur was the first FMCG advertiser for Republic TV and saw a great response, which led to 3x increase in ad spend toward the news genre.

The number of advertisers has come off on an overall basis, but a new slate of advertisers from startups, the digital space has come up on TV to build brands. The news genre also is being used as an advertising medium due to better ROI.

Despite the TRP ratings scam, advertisers have continued investment, while only news channels are holding back a little, but established news channels have continued to remain a priority for advertisers. Publishers and online platforms need to figure out regulation, advertising for some brands as several companies have 95% revenue from advertising.

There can be huge fallout of TRP scam on GEC as well. The news genre was not dependent on GRP, while GEC are highly dependent.

On the supply side, content generation came to a halt with the theatrical shutdown, and that has had a severe impact. However, there has been significant advantage to OTT platforms, which gained traction and new-age platforms attracting

disproportionate ad spend. Digital media grew ~30-40% YoY easily during this period. Ad spend moving from traditional to digital has been a clear phenomenon.

Large telco partnership is key for OTT, due to dependence on one another currently.

The print industry witnessed the largest negative impact during this period. However, the auto and healthcare verticals have come back strongly, with new launches for auto, personal hygiene and sanitizer products on print media.

COVID-19 had accelerated the decline for print although pre-COVID as well it was declining gradually. Print should be 60-70% of pre-COVID levels currently.

The sharp surge in digital trends can be attributed to:

1) arrival of digital age where it impacts every single part of an organization, age skewness and growing internet population,
2) consumers as well as companies realize digital adoption is becoming mandatory, and
3) digital monetization earlier was only via advertising, but today other methods have been employed, such as subscriptions, ads and eCommerce.

Digital will trigger new opportunities. Top 500 advertisers which control 90%, but other millions of advertisers also have moved to digital. SME do their own digital advertising, but their adoption is much slower. However, gradually SME's have been shifting which was a trend overseas few years back.

IRS, which was quarterly service for radio, measurement via other forms and engagement are being done via research agencies.

TV and Out of Home(OOH) are not 100% effective; hence, inefficiencies exist in all mediums but digital is highly measurable, can easily improve and become the most-effective medium for advertisers. Any amount spend can show whether it has worked on digital, which can even help advertisers revise ad spend as well i.e. lower ad spend if inefficiencies increase.

Deliverable for every publisher will be between reach and engagement rather than just reach, which was the case earlier.

The pandemic has forced a change in traditional mediums. For radio, it has re-imagined its purpose where 25-30% growth is from listenership. It has moved from just songs to talk shows, podcasts and audiobooks. Opportunity lies in monetization of this content, which was earlier lethargic. Audio will come up strongly with 25-30% growth. With syndication of content across platforms, radio networks will benefit with non-radio scaling up.

The value of a revenue-paying subscriber is going to increase significantly. Earlier, with 30-40 OTT platforms and several TV networks, content demand was high. But currently audience has become quality content-specific and willing to spend on marquee shows and content. Anchor properties like Amazon Prime and Netflix allow entry via marquee shows and then after that offer a variety of shows and genres

The digital ad pie will continue to be dominated by Instagram and Facebook as it is a consumer preferred platform and consequently social media will continue to own that pie. Video has a strong reach and might soon catch up to TV levels for brand-building. Digital has huge potential for luxury items. Digital has become a part of lives; hence, OTT firms and new platforms like Tiktok can compete with Google and Facebook.

Projections for FY25: Digital is likely to witness a disproportionate growth of overall 150% of base year over the next five years and even in other mediums, revenge consumption i.e. huge pent-up will be seen to some extent assuming the vaccine is administered. The industry will be INR 1,200-1,400bn by FY25 whereby digital pie being ~35-40% growth in FY21, and continued growth for the next 4-5 years will clock in INR 700bn, next to TV, radio in excess of INR 32bn and other mediums growing in the mid-single digits. With linear progression, digital will be much higher than other mediums, except TV. ■

OVERVIEW OF MARKET GROWTH FOR DTH & CABLE TV IN INDIA

Prabhudas Lilladher, a research based financial services organization in a report said that the pay TV services including cable TV and Direct-to-Home (DTH) will deliver "low single digits" growth in India.

Prabhudas Lilladher,a research based financial services orgainzation in a report said that the "uptick in DD Free Dish" along with the "higher growth in connected TVs" will restrict the growth of pay TV homes across India. The firm has highlighted that the pay TV homes, since 2012, have been on the rise across the country except for the services registering a dip in 2019.

DD Free Dish Registers Increase in Subscriber Base

In 2019, the firm said that the pay TV services registered lower growth as compared to the previous years due to multiple reasons including the English language viewers shifting to Over-the-Top (OTT) platforms. Prabhudas Lilladher said that the "strong content pie" on the OTT platforms enabled the English language viewers to make the shift from pay TV services. The firm also highlights that the DD Free Dish, the free DTH service from Prasar Bharati also registered an increase in its subscriber base in 2019, contributing to the restrictive growth of pay TV services.

Prabhudas Lilladher said that the DD Free Dish is now estimated to have a subscriber base of 35 million to 38 million with the platform now hosting 104 channels as of 2019.

"Post NTO 1.0, majority of the large broadcasters pulled out their FTA channels from Free Dish as TRAI mandated that FTA and pay channels cannot be part of the same bouquet," Prabhudas Lilladher said in its report.

The firm highlighted that the broadcasters converted their free-to-air (FTA) channels into pay channels in the price range of Rs 0 to Rs 1 and included them in the bouquets. Prabhudas Lilladher said that the move resulted in the "significant fall" in the reach of these channels with their "ad-revenues plummeted."

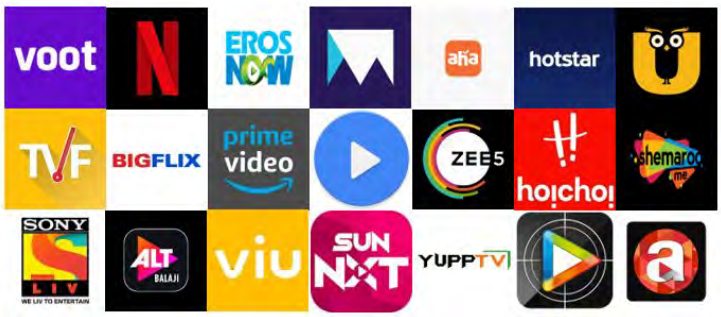
"In contrast, channels which remained on the Free Dish platform like Big Magic and Dangal saw significant rise in viewership and ad-revenues," Prabhudas Lilladher said in its report. "Thus, all major broadcasters like ZEEL, Sony, Star and TV18 have decided to make a comeback on Free Dish with their 2nd rung GEC's like Zee Anmol, Zee Anmol Cinema, Star Utsav, Colors Rishtey and Sony Pal."

Similarly, Prabhudas Lilladher said that the smart connected TVs are now present across 15 million

to 20 million homes as of 2019, due to "rising affordability." The firm said that it estimates the smart connected TVs base to cross 40 million by 2025 in India.

Indian OTT Market "Overcrowded"

Prabhudas Lilladher said that the Indian OTT market is "overcrowded" with over 30 players competing in the segment. The firm said that the OTT market in the country is in "evolution stage" with "most broadcasters" said to be "investing aggressively in building their own platform." Prabhudas Lilladher said that the OTT segment is witnessing "gradual shift in content consumption habits" with key factors including "cheap data" and increase in mobile subscriber base aiding OTT consumption.



"Rising rural internet penetration is expected to lead to migration in viewing habits from linear TV to digital in the long term," Prabhudas Lilladher said in its report. "Hence, having an OTT platform with strong content is key to capitalize on this emerging trend."

The firm said that Zee5, the OTT platform run by Essel Group through its Zee Entertainment Enterprises is "strongly placed in competitive OTT market."

"ZEEL has been aggressively investing in ZEE5 and expects break-even by FY24E," Prabhudas Lilladher said in its report. "We believe ZEEL's strategy to transit to digital medium is a step in the right direction given migration in viewing patterns from linear TV to OTT." ■

BUILDING & PROMOTING THE BROADBAND INFRASTRUCTURE

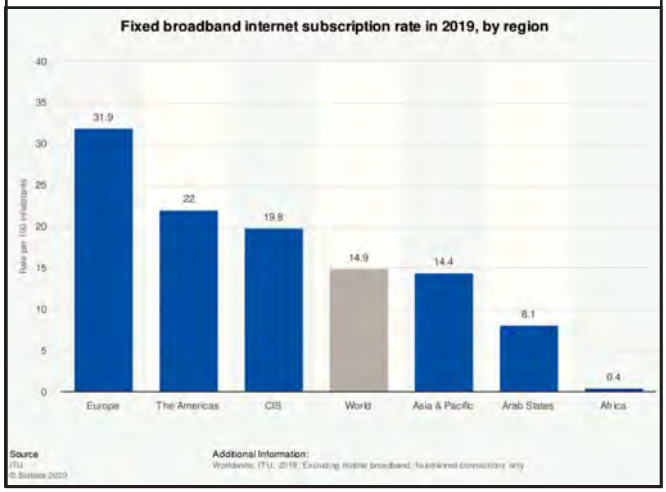
Broadband connectivity has received a boost with the Govt's Digital India Initiative. Boosting and promoting the broadband connectivity across the hinterland in India and metros will result in a growth trajectory for the media ecosystem.

Broadband will become a fundamental human right and it will be difficult to imagine life without broadband connectivity.

The government is going to put in place a national optic fibre map to help investors decide where they would like to invest and build capacities.

Currently, India has the second highest number of online consumers in the world, accounting for about 10% of the world's internet population. However, when we compare the same with India's share in the world population which is approximately 16%–17%, even this achievement looks below par. This becomes more alarming when we compare the fixed broadband penetration. As per www.statista.com, in 2019, it is estimated that, at global level, wired broadband subscriptions reached 14.9 active subscriptions per 100 inhabitants of the global population. In comparison, in India, we have approximately 1.5 active subscriptions per 100 inhabitants only. The region-wise details of fixed broadband internet subscription rate in 2019 are given in Figure 1.

Fig. 1: REGION-WISE FIXED BROADBAND SUBSCRIPTION RATE 2019



The Government has notified the policy objectives through NDCP-2018, one of those is to provide universal broadband connectivity @ 50 Mbps. To meet this NDCP-2018 objective, there are two important aspects that need a careful deliberation. One is to achieve universal broadband connectivity or 'broadband for all' objective; another is speed enhancement from 11–12 Mbps presently to average 50 Mbps.

MOBILE BROADBAND

Mobile internet has better availability and generally proves to be more affordable for low to medium usage than fixed-line broadband. As per the available details, at macro

level, except in some left out areas where the Government is executing certain schemes through USOF to fill the gaps in mobile broadband coverage, the wireless broadband coverage is available across the country.

Further, Wi-Fi technologies can play a significant role in the penetration of mobile broadband due to ease of deployment and faster rollout. In rural and remote locations where spread of houses is limited to a smaller area, wireless coverage using Wi-Fi technology may be cost effective and easy to maintain. In this manner, cellular and Wi-Fi technologies could complement each other in delivering the mobile broadband services.

In general, TSPs/ ISPs may incur substantially lesser costs in setting up Wi-Fi access infrastructure compared to mobile broadband networks like 3G/4G, especially in rural and remote areas. This is on account of the fact that Wi-Fi technology utilises unlicensed spectrum, the equipment is both cheaper and more readily available, and maintenance and operational costs are significantly lower. The lower cost of Wi-Fi delivery should easily translate into lower prices per GB for the end users, making it a more affordable service. Added to this is the fact that Wi-Fi networks can often offer faster speeds compared to mobile broadband, allowing users to access more bandwidth-intensive applications and content.

Despite significant progress in the space of mobile broadband, delivering reliable and affordable broadband services in the dense urban areas, inside the buildings, and rural and remote areas remains a challenge. World over, 'Wi-Fi hotspots' are used to fill this gap in cellular coverage. Moreover, in cellular covered areas, Wi-Fi may allow TSPs to offload their cellular data. While doing so, operators can offer a better user experience and higher access speeds to subscribers in Wi-Fi zone, hence facilitating subscriber satisfaction and retention.

Accordingly, the Authority issued its recommendations dated 9th March 2017 to the Government on "Proliferation of Broadband through Public Wi-Fi Networks" to promote use of Wi-Fi technology, which uses the unlicensed spectrum.

At present, as compared to monthly subscription charges of fixed broadband, the monthly charges of mobile broadband are less than one third. As per the report40 'ICT Price Trends 2019', published by ITU, in India, mobile broadband services cost less than 1 percent of per capita Gross National Income (GNI). As Wi-Fi technology use unlicensed spectrum, which is free, broadband services delivered using Wi-Fi technology would be even more affordable.

Accessibility of mobile broadband is also improving day by day as new as well as pre-owned mobile devices like Smartphones and Tablets are becoming affordable for masses. Further, the significant increase in uptake of video consumption in native languages and availability of multilingual keypads of mobile devices in Indian languages has reduced the language barrier and improved accessibility. Behind the regularly increasing subscriptions of mobile broadband services, better availability, affordability, and accessibility may be the important factors.

As the NDCP-2018 aims to provide universal broadband connectivity by 2022, still approximately 40% of total mobile subscribers are not accessing data services. Achieving 'broadband for all' objective of the NDCP-2018 may be possible using wireless technologies only.

FIXED BROADBAND

In promoting fixed broadband connectivity also, these three factors, i.e., availability, affordability, and accessibility, could be of considerable importance. It is pertinent to note here that, now a days, generally, the converged devices such as Smartphones and Tablets are commonly used for accessing mobile as well as fixed broadband. Therefore, to a large extent, the issue of accessibility may not be the limiting factor in growth of fixed broadband.

Fixed broadband service stands out when it comes to reliability, speed, and cost per GB of data consumption, while mobile broadband takes a lead due to its basic characteristic, viz., mobility. With fixed broadband, one can get up to Gigabit per second with symmetrical download and upload speeds and very low latency when compared to mobile broadband.

Some of the performance metrics of fixed and mobile broadband are compared in the Table 1:

In view of the above, generally, the broadband policies aimed at economic development focus more on improving fixed broadband penetration. For this, we need to roll out more and more optical fiber infrastructure in the access network, both in urban and rural India.

In European countries, primary internet access at home is provided mainly by fixed technologies. By the end of 2019, fixed broadband was available to 97% households41. Among fixed technologies, xDSL has the largest footprint (91%) followed by DOCSIS 3.0 cable (46%) and FTTP (34%).

TABLE 1: PERFORMANCE METRICS OF FIXED AND MOBILE BROADBAND

Performance metrics	Fixed Broadband	Mobile Broadband
Latency	Low	Relatively higher
Reliability	Highly reliable	Less reliable
Mobility	Mobility restricted within the premises	Full mobility
Minimum Speed Assurance	Possible	Not possible
Maximum Speed	Up to one Gbps	Up to 100 Mbps
Affordability	More affordable for heavy users	More affordable for light users

AVAILABILITY AND AFFORDABILITY OF FIXED BROADBAND

Demand for broadband services plays an important role in growth of the broadband connectivity. It depends on customer expectations. Generally, customers expect reliable and high-speed broadband services at affordable prices as they access videos and other bandwidth hungry applications. Meeting customer expectations largely depends on the technologies adopted by service providers.

A variety of broadband technologies like xDSL, FTTH, Cable TV broadband, Wi-Fi, mobile technologies like 3G, 4G, FWA, etc., are available in the market for delivering broadband services. The performance, availability, and affordability of broadband service delivered using different technologies vary.

In India, mobile broadband has better availability and affordability for cost-conscious subscribers. Though affordable, but the availability of public Wi-Fi hotspots to access broadband services is quite poor. The availability of wireline, i.e., xDSL, FTTH, and Cable TV, broadband networks is also limited to few cities and, the monthly subscription rates of fixed wireline broadband are generally higher than mobile broadband. The availability of FWA networks is miniscule.

It shows that, presently, other than cellular mobile technologies, availability of networks of other technologies is quite limited. There is a need for exploiting blend of wireline and wireless broadband technologies to promote broadband connectivity.

Fixed line broadband services are delivered using various technologies such as xDSL, G.Fast, Data over Cable Service Interface Specification (DOCSIS), Ethernet, and GPON, etc. Further it uses multiple mediums like traditional copper telephone lines, Coaxial cable, OFC, and combination of these mediums.

Broadband connections using xDSL technologies are provided over traditional copper telephone lines already installed to subscriber premises. DSL-based broadband transmission speeds ranges from several hundred Kbps to few megabits per second (Mbps). The availability and speed of an xDSL service depends on the length of cable used and deteriorates with distance. It requires relatively low investment in passive infrastructure if the cost of already laid copper cable is ignored.

The G.Fast specification is developed by the ITU-T and combines the best aspects of optical fiber networks and DSL technology to support access speeds of up to 1 Gbps via existing copper twisted pair for loops shorter than 250 meters. The access speed reduces as the distance increases further. ISPs can use G.Fast to increase broadband speed without having to extend fiber all the way to the home42. As G.Fast enables the use of existing assets, it may reduce the cost of providing broadband services and therefore improve affordability. G.Fast technology is deployed in many countries including U.K., Israel, and Australia, etc.

More than 50 % of the existing fixed subscribers are working on DSL technology. DSL broadband subscribers constitute about 60%–70% of the of total wireline telephony subscribers working on copper cable. Accordingly, in India, there is limited scope for growth of the fixed broadband using DSL technology.

CATV broadband is usually offered to customers via the existing CATV network. Since the bandwidth is shared among several users connected through a last mile cable, many times, the broadband speed reduces during peak traffic periods of the day.

In most of the cases, to deliver

high speed broadband services, Cable TV operators deploy Hybrid Fibre-Coaxial (HFC) networks. The implementation of DOCSIS 3.1 standard allows for higher bandwidths to end users of up to 10 Gbps. DOCSIS (Data over Cable Service Interface Specification) is an international telecommunications standard which enables the addition of high-bandwidth data transfer to the existing HFC network being used for delivery of cable TV services.

Optical fibre is the globally preferred technology to provide high-speed broadband to end users. Generally, it uses the Gigabit Passive Optical Networks (GPON) technology for provisioning of broadband services through FTTH connectivity. This is considered as future-proof solution but requires higher initial investment in the last mile connectivity.

Ease in deployment of OFC networks at reasonable costs plays a significant role in the availability of FTTH networks. In India, multiple challenges relating to delayed and costly permissions for RoW, prohibitive costs for laying new OFC, non-optimal utilisation of available wireline infrastructure in the country, non-availability of efficient marketplace for sharing, leasing, and trading of fibre, etc., could be few of the factors which may be impeding the growth of fixed line broadband.

In India, underdevelopment of fixed broadband market could be because of the dominance of the mobile telephony and lack of availability of wireline telephony infrastructure before advent of mobile telephony. It is a fact that before launch of mobile telephony in the country, the fixed line tele density was less than three percent only. As mobile became more affordable, the penetration of fixed line reduced further. This is evident from the fact that at the end of December 2019, when mobile tele density was approximately 87%, fixed line tele density was 1.6% only. Although time and again TSPs have revealed their intent through public announcements to invest in fixed line broadband network, not much has happened.

It is a fact that, in India, maximum numbers of houses have been wired using HFC networks for cable TV services. As per an estimate, the availability of HFC networks crosses more than 100 million households. Most of these networks have been established, and are being operated and maintained by local entrepreneurs, i.e., Local Cable Operators (LCOs). The procedure for registration of cable operator, under the Cable TV Act 1995, is extremely simple, and the Authority for registration has been delegated to local area head Post Offices. Requirement of regulatory compliances is also minimal. These could be some of the reasons that more than 60,000 local-level entrepreneurs opted for providing cable TV services. In approximately, a decade time they wired more than 100 million households.

World over, since the advent of the broadband, cable TV networks are being used to deliver fixed broadband. In India, share of the cable TV broadband in fixed broadband subscribers is minuscule.

Operations and maintenance of fixed line broadband is manpower intensive. By now, LCOs and their employees have more than two decades of experience in operations and maintenance of fixed line networks. In one of the world's largest and fastest program, these operators upgraded the existing analog cable TV networks to digital cable TV networks in less than five years. It indicates their determination and capability of adapting technology and marching with time. By doing an incremental investment, it may be possible to upgrade the existing HFC networks to deliver reliable and high-speed broadband, and re-skill available technical manpower in latest technologies. It would increase the availability of fixed broadband networks across India. Since it would enable exploitation of existing networks for delivery of additional services, this may be able to bridge the affordability gap also to a large extent.

At present, monthly Average Revenue Per User (ARPU) of fixed broadband is significantly higher than cable TV monthly ARPU. Existing licensing framework for internet services enables use of these networks for delivery of broadband services. As per the licensing framework for Internet Services, two options are available to LCOs, i.e., either they themselves can obtain ISP license, or they can enter into commercial arrangement with existing TSPs/ISPs to provide last mile connectivity. The licensing framework for internet services provide flexibility of area of operations through three

categories of licenses, i.e., category A, B, and C, at National, LSA, and District level, respectively.

One known issue, relating to payment of the license fee on adjusted gross revenue, which includes the revenue accrued from cable TV services, have been addressed by the Authority in its recommendations to the Government on "Definition of Revenue Base (AGR) for the Reckoning of Licence Fee and Spectrum Usage Charges" dated 6th January 2015. The decision of the Government on these recommendations is awaited.

Less than 15% of total wireline broadband connections in the country are working on FTTH technology. This could be because of limited availability of FTTH networks, which is considered as future-proof solution. This is reflected in the non-satisfactory progress in growth of FTTH broadband connections during the last 5 years, as presented in Figure 2.

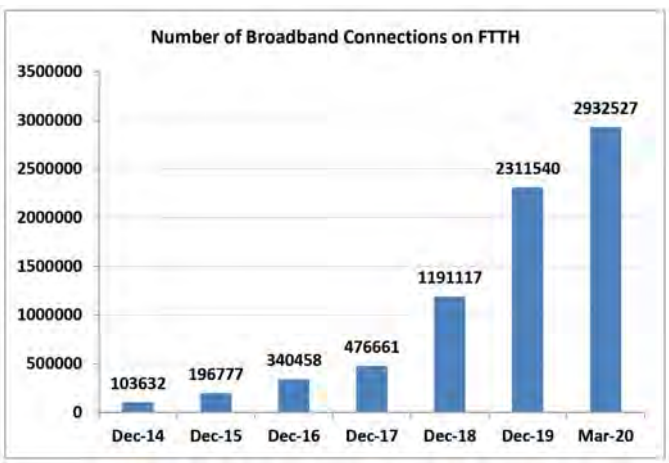
The other issue could be from demand side. Customers may not be finding enough value for money in subscribing to fixed broadband. This may be because of the customer's perception that there may not be much difference in performance between mobile broadband delivered using LTE technology and fixed broadband using DSL technology, which are the most prevalent broadband technologies in Indian market. Other probable reason for lower demand for fixed broadband could be relating to day-to-day maintenance issues. In comparison to cell level maintenance requirements of mobile broadband, fixed broadband requires maintenance of individual connections.

FTTH is capital intensive and takes more time for rollout. FWA can also provide an easier/cheaper solution to offer broadband connectivity to regions where wireline infrastructure is not present, or only copper wireline infrastructure is in place. Wireline networks using copper or fiber have traditionally been the preferred choice for delivering fixed broadband services due to their high capacity and reliability, but the need for universal connectivity means that alternatives to the wired network are more in demand than ever. Fixed wireless broadband networks using mainstream LTE-Advanced (LTE-A) technology are proving capable of delivering fast, high-quality, highly managed connectivity.

The surge in demand for high-speed broadband, along with the need to extend connectivity and improve the overall experience for broadband users, has opened new opportunities for fixed wireless access. As per Ovum consultancy, "Fixed wireless networks are increasingly contributing to home broadband connection in developing markets where levels of HBB penetration are particularly low. Today FWA represents more than 90% of total broadband connections in Nigeria and DRC, and over 50% in a number of other countries including Ghana, Uganda, and Bangladesh." As per GSMA, globally, over half of all LTE operators have launched an FWA service.

As the LTE networks are already existing, extending FWA over LTE can increase availability of fixed broadband. Use of common core and Fixed Mobile Convergence (FMC) may improve affordability. ■

Fig. 2: FTTH BROADBAND CONNECTIONS GROWTH IN LAST 5 YEARS



LIONSGATE LAUNCHES SVOD SERVICE IN INDIA

Lionsgate Play is a new SVOD service launched by Starz, a global OTT player and it is targeting the 15-45 age groups. The app will have content which includes feature films, premieres and original content to the audiences.

The SVOD platform is committed to innovation in its content, technology, pricing and accessibility by making premium Hollywood content available in multiple Indian languages.

Rohit Jain, Managing Director said "One of the insights that we constantly see, in all our research and all our feedback, is the complexity of decision making. What do I watch next? That's really the question all audiences struggle over the weekends and over their free time. Curation is the centre of our service, curating based on the world's best-in-class cinematic experience, world-class content that's core to our content philosophy."

Lionsgate will tie-up with Kunal Kohli, Mukesh Bhatt, Anil Kapoor and production houses like Endemol and Reverie for content production

"I'd like to believe we have a very well-rounded slate. We have collaborated with really accomplished makers and I am very excited with all the partnerships that we have in originals that we are making in India, which is not an overdose of crime and content, which is what I feel a little overwhelmed with, sometimes. There will be edgy dramas, slice-of-life stories,

comedy, some very interesting stories coming your way," Rohit Jain added.

SVOD market will see an expansion over the next five years in India. He said the Indian market will start hitting hundred million subscribers for SVOD, which is a pretty sizable interesting base, and they hope to get a reasonable share of that pie.

The app is priced at ₹ 99 per month and ₹ 699 annually.

Jeffrey A. Hirsch, President and Chief Executive Officer, Starz, said, "India has always been a key market for us. The large and diverse population increased data usage in urban and rural markets, and the adoption of OTT across all demographics created an exciting opportunity for us to launch Lionsgate Play. We're confident that our unique, exclusive and exceptionally curated content will generate a great response from Indian audiences."

Hirsch said the global SVOD space is evolving differently. "The Netflixes, Hulus and Amazons are trying to be broad in their content portfolios. They're serving kids, they're serving the parents; they're serving the young, depending on the channel that you have signed up for. We were very focused on adult premium, non-ad-supported content. We don't have kids, we don't have news, we don't have sports, we don't have advertising. It's very focused on adult content that we like to send that people are willing to pay for and we'll continue to lean into that strategy in a big way." ■

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