

15-17 February | Hall 12A | Pragati Maidan | New Delhi

Evolving Media Ecosystem: Innovative, Immersive & Sustainable



# **EVENT REPORT**



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The 28<sup>th</sup> edition of the Broadcast Engineering Society (India) Expo (BES Expo) stood as a pinnacle in the broadcasting community, bringing together industry leaders and professionals. Endorsed by the Ministry of Information & Broadcasting, Ministry of Communications &IT, Ministry of Electronics Information & Technology in collaboration with the International Association of Broadcast Manufacturers (IABM) and DRM, the event garnered widespread support from key entities like Prasar Bharati, ABU, AIBD, UNESCO and Society of Broadcast Engineers (USA).

As a focal point for the broadcasting community, the 28th BES Expo played a pivotal role in advancing the field. With a diverse array of sessions, the edition delved into critical topics such as Innovation in Content Production, Content Marketing, and Monetization Strategy for Over-The-Top (OTT) platforms. Additionally, the expo covered emerging trends in Animation, Visual Effects (VFX), Comic and Gaming, reflecting the evolving landscape of media and entertainment.

The participation of major exhibitors, delegates, and visitors from both India and abroad underscored the global significance of the BES Expo. Recognized for its thematic approach to the current state of broadcasting, the event served as a platform for knowledge exchange, networking, and showcasing the latest advancements in the industry. The ongoing success of BES Expo highlights its integral role in fostering innovation and excellence within the broadcast community.





# **Introduction to Broadcast Engineering Society (BES)**

Established in 1987 and registered with the Registrar of Societies in Delhi, India, the Broadcast Engineering Society (India) serves as a dedicated advocate for the interests of broadcast professionals both nationally and internationally. Originally conceived by a passionate group of broadcast engineers, the society aims to advance knowledge and practices in broadcasting and related sciences.

Over the years, it has expanded its influence with a headquarters in New Delhi and 12 local chapters nationwide. Through seminars, workshops, and symposiums, the society fosters education, research, and training in broadcast engineering.

Additionally, it plays a pivotal role in projecting the profession's interests globally, facilitates technology exchange through exhibitions, and provides a platform for professionals to interact and share expertise. Recognizing outstanding contributions, the society also presents awards in various broadcasting disciplines. The culmination of these efforts is the internationally acclaimed BES EXPO event.



# **SCHEDULE OF THE CONFERENCE**

### Day 1

Friday, 15<sup>th</sup> February 2024

## **Inaugural Session**

Welcome Address

Mr. Sunil President, BES Address

Mr. Gaurav Dwivedi, IAS,

CEO, Prasar Bharati

Distribution of BES Award by

# Mr. Anurag Singh Thakur

Hon'ble Minister for Information & Broadcasting, Youth Affairs & Sports, Govt. of India

Release of Exhibitor Directory and Conference Proceedings

**Special Address** 

#### Mr. Sanjay Jaju, IAS,

Secretary, Ministry of Information & Broadcasting, Govt. of India

Keynote Address

**Mr. Anil Kumar Lahoti** Chairman, TRAI, Govt. of India Address by the Chief Guest

# Mr. Anurag Singh Thakur

Hon'ble Minister for Information & Broadcasting, Youth Affairs & Sports, Govt. of India



## Inauguration of the Exhibition by

# **Mr. Anurag Singh Thakur**

Hon'ble Minister for Information & Broadcasting Youth Affairs & Sports, Govt. of India

with

Mr. Sanjay Jaju, IAS,

Secretary, Ministry of I&B, Government of India Mr. Gaurav Dwivedi, IAS,

Chief Executive Officer, Prasar Bharati

# Session 2 : ATSC3.0 Broadcasting

Session Chair

#### **Mr. Ahmed Nadeem**

Secretary General, Asia Pacific Broadcasting Union, Malaysia

**Mr. Mark Simpson** 

President & CEO, Triveni Digital

# Mr. Mark Corl

Sr. Vice President, Emergent Technology

#### Mr. Ralph Bachofen

Sr. Vice President, Sales and Marketing, Triveni Digital

# **Building OTT platforms: Key considerations**

Tutorial

Mr. Vikrant Khanna CEO, Mogi I/O



# Day 2

Saturday, 16<sup>th</sup> February 2024

## Session-3: Direct to Mobile Broadcasting

Keynote Address

Mr. Delbert Parks, President, Sinclair Technology, USA

#### Session Chair

Mr. Shashi Shekhar Vempati Former CEO, Prasar Bharati

Prof. K. Giridhar

#### **Mr. Vinosh James**

Director, Technical Standards, Qualcomm

#### Mr. Sathish Chittibabu

CEO, Fanisko, USA

#### **Mr. Prashant Maru**

Vice President, Saankhya Labs

## Session-4: Digital Radio Broadcasting–Challenges Ahead

#### Session Chair

**Mr. N. Thiyagarajan,** IBES, former Addl.DG, AIR, South Zone

#### **Mr. Ashruf El-Dinary**

Senior Vice President, Radio Technology Solutions

#### **Mr. Alexander Zink**

Vice Chairman, DRM Consortium Mr. Akshay Raju

Senior Staff Engineer, HD Radio: The future of Car Broadcast Audio

#### Mr. Vishwajeet Chauhan

Business Development Manager, India: Cloud Digital Radio

#### Mr. Thimmaiah Kuppanda

Senior Consultant– Technology and Business, IIS



Special Address by

#### Mr. S. Krishnan, IAS,

Secretary, Ministry of Electronics and Information Technology (MeitY)

# Session-5: Changing landscape of Satellite communication: New Horizons for Broadcasters

#### Session Chair

#### Mr. V.J. Christopher

Wireless Advisor, WPC, Ministry of Telecommunications , Govt. of India

#### Mr. Anil Prakash

Director General Space Industry Association

Mr. Sanjeev Gupta Associate Director, SATCOM, ISRO

# Mr. Harsimranjit Gill

Country Manager, Intelsat

#### Mr. Gurvinder Chohan

QTSCINC, Canada

#### Mr. Nilanjan Raut

Chief Manager, New Space India Limited (NSIL)

SESSION-6: WRC-23: Impact on Indian Regulatory Framework

#### Session Chair

#### Mr. Sanjiv Shankar, IRS,

Joint Secretary, Ministry of Information & Broadcasting, Govt. of India

#### Mr. M.K. Patnaik

Senior Deputy Wireless Advisor, WPC, Gol Mr. H Rayappa Director, Satcom, ISRO HQ Mr. Jitendra Singh Director, Qualcomm

# Mr. Bharat B Bhatia

President, ITU-APT Foundation of India



### Day 3

Sunday, 17th February 2024

Session-7 : Innovation in Content Production and Post Production

#### Session Chair

#### Mr. Senthil Rajan, IIS,

Joint Secretary, Ministry of Information & Broadcasting, Govt. of India

Mr. Muralidhar Sreedhar Global Head & Sr VP, Prime Focus Technologies

Mr. Rishi Sinha Executive Producer, Network 18 Mr. Naoki Nakatani NHK Media Innovation Centre, Japan

# Mr. Akshay Sharma

Co-founder, Personate

# Session-8 : Content, Marketing and Monetization Strategy for OTT

#### Session Chair

#### **Mr. Alok Agrawal**

Former Member, Prasar Bharati Board & Co-founder, Al4 India

Mr. Pankaj Krishna CEO, Chrome DM

Mr. Harit Nagpal CEO, Tata Play Mr. K Parsanna Co-Founder & CSO, FanCode

Mr. Ramsai Panchapakesan

Head, Havas Media

Special Address

**Mr. Devusinh Jesingbhai Chauhan** Minister of State for Communication, Govt. of India



# Session-9: Animation, VFX, Comic and Gaming

#### Session Chair

#### Mr. Armstrong Pame, IAS,

Director, Ministry of Information & Broadcasting, Govt. of India

#### Mr. Satyakashi Bhargava

Film Maker/Writer, Author, Animation Director, Bhargava Pictures

#### Mr. Ashish Kulkarni Chairman. FICCI

#### Mr. Bharavi Kodavnti

CEO & Animation Head, MARA Creations Pvt. Ltd.

#### Mr. Aniruddh Ghosh

Sr. Manager, Whiteways, Singapore

### Session-10: Panel Discussion on Deep Fake impacting Social Media and News

**Session Moderator** 

#### Mr. Shashi Shekhar Vempati

Former CEO, Prasar Bharati

# Mr. Avinash Pandey

CEO, ABP News

Ms. Smita Prakash Chief Editor & Dy. CEO, ANI

#### Mr. Mayank Aggarwal

Former CEO, Prasar Bharati

#### Mr. Vivek Malhotra CMO, India Today

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# Day 1

Friday, 15<sup>th</sup> February 2024

# **INAUGURAL SESSION**







## Mr. Sunil, President of BES

Mr. Sunil is the President of BES(I), Governing Council Member of Institution of Electronics and Telecommunication Engineering & the Vice President of Asia Pacific Broadcasting Union. With 35 years of experience in broadcasting, and as the Additional Director General Prasar Bharati, Head of Technology, Planning, Global Outreach, Marketing, Central Archives & External Services Division of All India Radio. He has a rich experience in project management of broadcasting projects in India and overseas.

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### Mr. Sunil

President, BES

## WELCOME ADDRESS

Ladies and gentlemen,

At the outset I would express my sincere thanks to the dignitaries on the dias for taking out time to address the august gathering today.

BES, a non-profit society, established 37 years back, functions with a social cause of promoting the advancement and dissemination of knowledge & practices of broadcasting and enhancing the knowledge of broadcast engineering professionals.

Today the broadcast industry is undergoing tremendous challenges,

**ONE:** Terrestrial broadcasting.

Broadcasting was considered to be one to many means of communication.

This concept is being challenged due to the onset of internet-based broadcast technologies, especially for a country like India where there is a huge market.

The vast population, multitude of languages and dialects together with a proliferation of various technologies and channels, have resulted in the mushrooming of a large number of radio and TV channels compared with other parts of the world.

In contrast, there are not many cable or satellite channels in other parts of the world, where there are only a few languages. And if at all they are available, they are very costly and not affordable to the common man. Due to this, the Terrestrial broadcasting is still flourishing in those parts of the world whereas in highly populated countries like India, the onset of satellite-based broadcasting and cable broadcasting & now the OTT have almost made the Terrestrial broadcasting, especially in the television segment non-existent, more so due to the low cost of DTH system & the monthly subscription.

**TWO:** The next challenge for the broadcasters is from the internet. Today internet-based broadcasting is giving a big challenge for the DTH and cable operators. India has got over 43% of internet users now, which is a very high penetration & is likely to increase further.

The availability of a 5G internet connection with a good speed can give a good video connection to the consumers. Many of the social media platforms are now offering audio and video content on the go. Hence the concept of broadcasting from one to many has changed.



The concept of linear broadcasting by the broadcaster at a particular time is been challenged by the comfort of getting your desired program at the desired time at a desired location. Today social media users are consuming more content than what normal viewers watch on TV. Hence broadcasting, whether it is entertainment, information, or education, is changing very fast for a country like India which has a demographic tilt toward the young population.

**THREE:** Another challenge or advantage to the broadcasters is that India will have more than 50% population in the age bracket of 15 to 35. It is obvious that this young group of the population has better access to high-bandwidth internet. This will enable the young population to access audio and video content through the internet.

Hence the future will depend on the extent to which the broadcaster can reach the young population which has got the internet access.

**FOUR:** The next challenge for the broadcasters is the content. Shifting from analog to digital has opened up many opportunities. Today consumers are using more and more digital content daily, on mobile phones, laptops, desktops, and other devices. Broadcasters are recognizing this need to stay relevant. For this, the business model has to be changed. The world-over broadcasters and OTT players are looking for new ways to get additional viewership. Examples are Netflix and Amazon which have invested heavily in generating creative content. This will generate lots of business for creative content generators.

**FIVE:** Another area of upcoming Technology that is going to revolutionize the content is augmented reality and virtual reality. Lots of development is taking place in this field and is likely to change the way the content is generated.

With the opening of 5G Technology, the internet is faster than ever. This is changing the way the news is being reported and broadcast. Gone are the days when the cameraman is deputed to cover an event. The availability of 5G internet with advanced mobile phones and high-resolution cameras is replacing the ENG. In this MoJo revolution, the mobile cameras give good quality video which enables a reporter to directly telecast the event or news from any spot, and is generating a rat race among broadcasters to deliver the news first on all available platforms.

**And LAST:** The biggest disruption in technology which is creeping in the broadcasting Arena: The D2M where the most important thing about D2M is that a mobile user can use it without the internet, without a SIM card. It replicates the terrestrial broadcasting of earlier times when we used to put up antennas outside our homes and our TVs would start receiving broadcasts without any payment and without any other device.

There are about 28 crore households in the country, out of which 19 crore households



have TV and the rest 9 crore households are TV dark. At the same time, the number of mobile phones in our country is about 80 crore, expected to rise to 100 crore. That means, leaving aside the very small children and others, almost everybody in the country is going to have a mobile phone.

Feature phone numbers add another 25 crores. So almost everybody is going to have a mobile phone.

So Direct-to-Mobile provides a tremendous opportunity for the broadcasting sector to reach almost everyone. And if this happens, then it is going to lead to a tremendous increase in the consumption of data & consumption of the content. That is going to lead to a profusion of content creation, and also provide several new job opportunities to people.

Imagine today the content is consumed across about 19 crore TV households. And when it goes to almost 80 crore mobile phones, then the content consumption will increase manyfold.

And of that, 70% of the traffic is video, which is a very high content.

So when we talk of the data consumption on the IMT networks, it is the video content that is taking the most of the data. If this can be offloaded to D2M, even a part of it, which goes directly to the mobiles from the broadcasting networks, then it will reduce a tremendous load on our 5G networks, the 4G networks, and the clogging that takes place.

World over, the economies have helped their own country technologies for the deployment. And I believe that India presents an excellent use case where once this technology gets adopted, it can be deployed also globally, we will have an India-developed technology, where we own the intellectual property rights, and which can be exported at a global scale.

When we are in a position to leapfrog in terms of technology, we should be in a position not only to dictate the spectrum allocation but also the standardization roadmaps. As a country, we should be in a position to deflect the standardization roadmap and bring it in alignment with the case where we hold the IPRs.

And that is how the world economies have always played the standardization game.

As a homegrown developed technology in India, it deserves support from a standardization perspective, from IPR's perspective, and from a national security perspective, which will drive the future evolution of a converged technology.

Why the homegrown developed technology in India, deserves support: Speaking about electronics manufacture, and what we are doing today in electronics manufacture is undoubtedly very important simply because of the number of jobs it offers.

If you look at this iphone which is made and manufactured just outside Chennai in a



factory that currently employs about 50,000 people, it must be the largest factory in India, employing so many people. The criticism is that the value addition that takes place is, say, between about 12-15% of the value of the goods. Otherwise, everything comes in and just gets put together.

And if we are to counter that criticism, more and more of the components need to be manufactured in the country. That is a process in which investment needs to take place. The electronic sector needs to move into that space and manufacture that which is important, undoubtedly, and that is something that the government will promote.

If you just estimate the value of an iPhone, let's say, at about \$1,000 in the US. Of that \$1,000, probably all the people who are in the manufacturing chain, all the Foxconns, the Pegatrons, the Tatas, and various others who manufacture various bits of it, several Taiwanese companies, Chinese companies, other companies, all of them put together, they'll probably take home about \$250 to \$300, at the best. \$700 to \$750 is still sitting in Cupertino and is still sitting with the people who originally developed the IP, which is why I think today's event is significant. We are talking about an intellectual property which has been developed in this country.

Considering these, BES has put up this year's EXPO with a conference theme, "Evolving Media Ecosystem: Innovative, Immersive & Sustainable" with a wide variety of topics of contemporary broadcasting technologies like Direct-to-Mobile Broadcasting, Building OTT platforms, content marketing, and monetization strategy for OTT, Animation, VFX, Comic & gaming, Deep fake impacting Social Media, remote IP and cloud-based production, Digital visual radio, content monetization, spectrum, the changing landscape of satellite communication, regulation, and so on. The experts will deliberate on these topics and the delegates will be immensely benefitted. I wish all the delegates an immersive interaction with the experts in the field and also get enriched from the exhibition.



# Mr. Gaurav Dwivedi, IAS, CEO, Prasar Bharati

Gaurav Dwivedi is a 1995 batch IAS Officer of the Chhattisgarh Cadre. He is a recipient of Prime Minister's Award for excellence in Administration for his work on Food Security and computerising paddy procurement and PDS distribution. He started his administrative career as an Assistant Collector in Kerala before joining Chhattisgarh Government. He has worked in various capacities in Kerala, Madhya Pradesh and Chhattisgarh. He has also been a faculty member at the Lal Bahadur Shastri National Academy of Administration, Mussoorie. He was the first CEO of My Gov India under Ministry of Electronics & Information Technology and managed the Gol's citizen engagement platform launched by the Hon'ble Prime Minister Shri Narendra Modi in 2014. As CEO of My Gov India, organized the 'My Gov Town Hall' in 2016. Hailing from Uttar Pradesh he did his schooling from Apeejay School, Noida and graduated in Zoology from the Hindu College of Delhi University. He is a Trium MBA, with Joint Degrees from London School of Economics, New York University's Stern Business School & HEC Paris. He is currently the CEO Prasar Bharati.



Mr. Gaurav Dwivedi

CEO, Prasar Bharti, IAS'95

### ADDRESS

#### Morning Everybody!

Hon'ble Minister for Information and Broadcasting, Youth Affairs and Sports Sri Anurag Singh Thakur Ji, Respected Chairman TRAI, Sri Lahoti Ji, Respected Secretary, Ministry of Information and Broadcasting Sri Sanjay Jaju ji, Sunil, distinguished guests, Exhibitors, delegates, friends from the Media, Ladies and Gentlemen!

I thank BES for this opportunity to address this eminent gathering of Broadcast professionals. I am happy that BES is continuously working hard to fulfill its objectives to promote the advancement, dissemination of knowledge and practices in the field of Broadcasting and related services.

The theme of the current BES EXPO 2024 is "Evolving Media Ecosystem: Innovative, Immersive & Sustainable Broadcasting" and is very apt for the times as the media and entertainment sector and the industry is changing today faster than ever.

The media ecosystem has evolved through centuries from simple spoken word storytelling to the present-day developments of mass media consumption, personalisation and on demand consumption. Having evolved from the Voice to the written word to the printed word, to radio, to television, to broadcasting, to internet, to on demand streaming services, and so on and so forth, the industry has seen many rapid developments in the last 30-40 years and today, unlike what many people thought, that possibly each new development, may finish off the older technologies, we find that none of these technologies has actually died out. All of them are a part of this ecosystem and all of them have their own space and from time to time, geography to geography, we find differences in the consumption pattern where the need for the good content always remains.

The digitalization of television and the emergence of new media devices have redefined the broadcast landscape. The features offered by todays technologies like personalisation and the accompanying interactivity and the technical capabilities of the new media platforms have thrown a world of new opportunities and challenges to all the stakeholders.

The emerging market of content consumers predominantly consists of youngsters who have much more varied choices than were available even 10-15 years back. There is a demand for consuming content on all possible display devices and especially on demand



content, irrespective of location or time.

This emerging ecosystem is posing a great challenge to the traditional broadcasting model. The traditional broadcasters need to evolve, innovate, and reach out to the audiences through multiple platforms by using the new services and the new technologies to complement the services rendered through the traditional or satellite based terrestrial broadcasting systems. This requires a considerable commitment of resources to emerging platforms and technologies while sustaining the traditional linear models. It is also equally important to involve all the stakeholders during the experimentation in the pilot stages , when the new services are launched to infuse confidence so that when the services are launched, appropriate good quality content and receivers are available so that the viewers or the content consumers can actually consume that content.

The Public Broadcasters especially have the responsibility to cover all citizens and they must expose values which are not only industrial or commercial in nature but which aim for the benefit of society at large.

Today, (Over-The-Top) services, Digital Cable, and DTH operators are competing with each other to occupy more space in the broadcasting industry for the distribution of content. Each of these platforms have their own USPs. OTTs have caused great disruption to the traditional broadcasting and are becoming more and more popular – especially in the urban areas. As the services are using internet connections, they can be accessed anywhere where data services are available . Many DTH operators are also providing access to their services through OTT to complement their traditional models and keeping their consumers with them. However, the requirement of reliable high-speed broadband limits their reach.

Another competing element in the broadcast media ecosystem of late has been the entry of telecom operators. The demands for spectrum by telecom service providers to roll out 4G and 5G services and wireless video streaming solutions have put a lot of pressure on the broadcasters . This has compelled the broadcasters to look for better compression technologies and competing solutions and standards. While allocating spectrum to the telecom operators and other wireless service providers, there is possibly a need to keep the spectrum reserved for the broadcasters so that services like D2M, HDTV, and other innovative services can be rolled out.

Though we deliberate and attach a lot of importance to the technologies behind these new media what actually matters is the content that these new media technologies promise to offer in building and entertaining the society. You must always remember , despite all the technology that we have at our command, content is finally watched for the quality of the content, not as a curiosity just because it is projected in a certain format.



The emerging ecosystem is a complex, diverse, rich, and highly interactive system and to sustain the business it requires out-of-the-box thinking and quick adaptability to the new standards, expectations, and ways of life.

Only time will tell whether the viewers' demand for choosing content from a wide range of options available will be strong enough to break the broadcasters' grip over the content. We will also possibly need to work very hard , in terms of identifying the technologies such as AI, automating content generation and to reduce the turn around time in terms of content production and processing.

I hope the sessions, the tutorials and the conference discussions spread over these three days will be able to address current scenario, issues, challenges, and opportunities in the respective fields and will be able to drive the Indian broadcast industry towards future readiness.

Wish you all the best.

Thank you.

# Mr. A.S. Kiran Kumar

Chairman, Physical Research Laboratories Management Council, (Former Chairman, Department of Space, Gol)

Mr. A.S. Kiran Kumar is a renowned an accredited scientist from the Indian Space Research Organisation, Chairman, Physical Research Laboratories Management Council, and Former Chairman, Department of Space, Govt. of India. He obtained his Physics (Honours) Degree from Bangalore University in 1971 and later obtained his Master's degree in Electronics from the same university, and thereafter his M.Tech Degree in Physical Engineering from the Indian Institute of Science, Bangalore. He has spurred the implementation of application-oriented Indian space programs, which has facilitated rapid development of the country in many important spheres, be it observations, communication, navigation, and space sciences.

> Broadcast Engineering Society Confers the HONORARY FELLOW & LIFETIME ACHIEVEMENT AWARD to Mr. A.S. Kiran Kumar for his exemplary contribution to Space Research and Satellite Broadcasting

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Distribution of BES Award to Mr. A.S. Kiran Kumar, Chairman, Physical Research Laboratories Management Council, (Former Chairman, Department of Space, Gol) by Mr. Anurag Singh Thakur, Hon'ble Minister for Information & Broadcasting, Youth Affairs & Sports, Gol

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**Release of Exhibitor Directory and Conference Proceedings** 





# Mr. Sanjay Jaju, Secretary, Ministry of I&B

Sanjay Jaju, IAS Secretary, Ministry of Information and Broadcasting, Government of India, has taken over the charge of Secretary in the ministry on 5<sup>th</sup> of February 2024. He has worked in diverse areas, including defence, urban infrastructure, civil supplies, education, tribal welfare, and Information Technology. He has worked as Additional Secretary in the Department of Defence Production in the Ministry of Defence, Government of India, and looked after the policies aimed at bringing in investments and growth in the defense and aerospace sectors to advance the Make in India resolve. He has been conferred the prestigious Prime Minister Award for Excellence in Public Administration.



## Mr. Sanjay Jaju

IAS, Secretary, Ministry of Information and Broadcasting, Gol

## SPECIAL ADDRESS

Honorable Minister for Information and Broadcasting Shri Anurag Singh Thakur Ji, Respected Lahoti Sir, Chairman TRAI, distinguished guest Mr. Sunil, esteemed friend Gaurav Dwivedi, ladies and gentlemen, a very warm good morning to all the dignitaries on the dias, notable speakers and dear colleagues. Ladies and gentlemen. I'd like to take this opportunity to congratulate BES for organizing this workshop.

Friends, we are aware that the broadcasting industry has changed significantly from the time we used to have the black and white TVs. And Now, we have the cable TV and the satellite TV, and increasingly so now we have the streaming services which are now shaping the future of TV and creating an absolutely immersive viewing experience.

Friends, availability of high-speed broadband networks have actually catalyzed this transition and these technologies have actually paved the way for new services to the consumers like the video on demand, direct to mobile, Wi-Fi based broadcast over linear TV, augmented reality, virtual reality, artificial intelligence and machine learning based subtitling, program suggestions, audio-video gaming, digital radio podcast, audio video streaming etc. I think it's an endless list that's now shaping the current generation and all of this has made consumers more demanding now and they're yearning for similar experience on all kinds of devices be it a smartphone or a TV or a tablet or a PC. Everybody is demanding bundled services.

As far as the broadcasting services are concerned, the sector which stood at INR 2.1 trillion i.e lakh crores in 2022 is now expected to grow to 2.83 trillion Indian rupees by 2025. It can arguably claim to be one of the most fledgling sectors in the economy which has also got a direct impact on people.

And friends, television in this is the largest segment in the sector followed by digital media. And as per some reports, TV shows a promising growth of 12% and digital media shows the growth of 40% year on year and that's huge. The continuous growth in TV in last decade is clearly evident from the number of private channels that we have. You are aware that we have close to 900 channels, out of which 350 are paid channels and these private channels along with 35 channels that Doordarshan has and they have been carried by four DTH operators in our country and about 998 MSOs and each of them are having about 65 million subscribers and out of these 300 million households, i.e 30 crore households in India, there are 90 million TV dark houses which shows a lot more space for TV to grow.



Coming to the radios, they are also not lagging behind. We have close to 388 private FM radio stations, 591 all-India radio stations and about 480 odd community radio stations which are catering specifically to the rural masses. Prasar Bharati, the public broadcaster, is also catering to the masses with 35 Doordarshan channels and also a DD free Dish DTH service which is carrying over 160 DD and private channels.

Over these years, one can see an increased convergence between telecom and broadcasting. And there are discussions about convergence of medium businesses and the necessity for regulatory convergence especially in view of the diversity of a country like us. The convergence of broadband and cable TV in a vast and diverse country like India will actually be running parallel to the existing DTH and the cable form of services that we have in our country.

And in this evolution of technologies which is happening both are expected to coexist for a long period of time. As you all know, broadcasting is actually a strategic sector and there are regulatory requirements of broadcasting as well as telecom frameworks. The principle broadly remain the same as broadcasting is one to many transmission which is also fundamental to the Constitutional values of freedom of speech. At the same time, both of them have a different prescription of regulations and it is in this context that the Ministry of Information and Broadcasting is trying to achieve regulatory convergence by following ease of doing business models. That's how the broadcast Seva portal has been created in the Ministry which is actually a single one-stop shop for all the licensing permissions and reporting requirements of all the broadcasters within our country. This portal is also integrated with the Department of Telecom Saral Sanchaar portal and the portals that the Department of Space and the Ministry of Home Affairs have. Friends, all of this is going to go a long way in ensuring holistic development of this sector and would allow the growth of the newer platforms.

As you are also aware that Ministry is currently in progress on bringing up and coming in with a National Broadcasting Policy framework and certain broad goals and strategies have been identified. The consultation with TRAI is also going on regarding certain specific issues. At the same time, the Broadcasting Services Bill would also pave way to simplify the regulatory system for this segment and this bill would ensure consumer protection while providing media transparency through self-regulation and content evaluation committees.

The broadcasting space has evolved now with the emergence of OTT, DTH and now even the D2M models which are coming in. One hopes that the Bill has provisions for all these future technologies and would provide a graded mechanism for fines and penalties to ensure a balanced development, so that on one hand creative freedom is retained but at the same time repeat offenses are penalized sufficiently to create sufficient deterence. We also endeavor to expand the panel size by use of return path data mechanism. We also



intend to expand it to other medium like OOH and other digital mediums.

Technology has to enable better utilization of spectrum which is a finite resource. The newer technologies in addition to offering better quality of audio video content also support more efficient utilization of spectrum. I think that's where all of you as technocrats would continue to play a huge role. There have been recommendations from TRAI to provide digital radio broadcasting services in the vacant spectrum of the FM band, and starting with some bigger bigger A+ category cities. It has also been recommended to have the FM radio channels auctions and dealing them from technology. Prasar Bharati has also completed experimental trials of IT recommended digital radio broadcasting technologies in the FM band in Delhi and Jaipur and we have constituted a committee to identify frequencies for Digital radio broadcasting and we hope to finalize the recommendations soon.

Another important technology which enables better utilization of spectrum would be direct-to-mobile broadcasting. This is a next generation broadcasting technology which would enable direct delivery of broadcast signals i.e. video, audio, data etc. to mobile phones and smart devices by leveraging terrestrial broadcast infrastructure that we have. And to cater to these bandwidth requirements, broadcasting networks would need to be designed oversized with overcapacity which will involve larger spectrum and enormous CAPEX and OPEX investments.

The most optimum solution would be to offload the broadcast requirements to broadcast networks through the D2M technologies. The key factor for success is developing a sound device ecosystem, so that the devices are easily available and accessible and it is essential that we work in parallel with the device manufacturers to integrate the receiving systems in various mobile devices.

All of you are aware about the Atmanirbhar Bharat pledge, that honorable Prime Mminister has been calling us to create in various sectors of our economy. The indigenous development of broadcasting equipment is one of the pivotal pillars in that particular framework. You are all aware that close to USD 20 billion of equipment is currently being imported in our country. This includes head-end equipment, consumer premises equipment, network equipment and all other kinds of cables etc. The Ministry of Information and Broadcasting is working with the DPOs to enhance indigenous components in all these components. It is important that growth of the broadcasting industry is also coupled with the growth in local manufacturing. That will not just help us save critical foreign exchange but at the same time make all these devices become affordable for a country like us which has a huge population. It is in this regard that specific focus has been given to enhance the ease of doing business in this sector.

Various provisions have been decriminalized through the Jan Vishwas Act and at the same time the digitally enabled broadcast Seva portal is also becoming a single platform



for you to have the interface with the Ministry. It will be a constant endeavor to push ease of doing business and we'll try and create a dynamic system in which we listen to your complaints and grievances and at the same time, your suggestions to make such portals more and more interactive and user friendly. Friends, I wish all of you success not just in your workshop but in all the endeavors that you pursue. I would also like to thank the organizers for allowing me this opportunity. I congratulate you for being part of this momentous event.

Thank you very much.





# Mr. Anil Kumar Lahoti, Chairman, TRAI

Shri Anil Kumar Lahoti is Chairman TRAI and is an officer of Indian Railways service of Engineers from the 1984 batch . He had superannuated as the Chairman and CEO of the Railway Board on 31<sup>st</sup> of August 2023 after a career spanning about 37 years in Indian Railways. He is a graduate in Civil Engineering from Madhav Rao Scindia Institute of Technology and Science Gwalior with a Gold Medal and has a Masters degree in Engineering from IIT Roorkee. He has worked in various positions in Central , Northern, North Central, Western and West Central Railway as well in the Railway Board. His expertise includes railway operation and has taken serious initiative to modernise and mechanise track maintenance. He has extensively contributed to planning and structuring of new areas to redevelop projects in various positions.



### Mr. Anil Kumar Lahoti

Chairman TRAI, Gol

# **KEYNOTE ADDRESS**

Honourable Minister for Information and Broadcasting, Youth Affairs and Sports, Shri Anurag Singh Thakur Ji, Shri Sanjay Jaju, Secretary, MIB, Shri Gaurav Dwivedi, CEO Prasar Bharati, Shri Sunil and Shri Aftab Ahmed from BES on the dias, esteemed participants from the broadcasting industry, members of press and media, and distinguished delegates. A very good morning to all of you.

It is indeed my pleasure to be here in this conference and to be addressing you on the subject of evolving media ecosystem - Innovative, Immersive, and Sustainable, the subject chosen by the conference organizers. I compliment them for selecting a very topical and contemporary subject for this conference and thank the organizers for inviting me to speak on this occasion.

As we know, the broadcasting sector stands as one of the cornerstones we can say of India's economy and is a vital component of the country's dynamic media and entertainment industry. It holds vast potential for growth, which my previous speakers have just now elaborated in so many details. The sector has been phenomenal in attracting investments, fostering creativity, and elevating India's soft power globally. As per an industry estimate, the M&E sector generated a revenue of nearly USD 46 billion in 2022 and is expected to reach USD 74 billion by 2027, a CAGR of around 10%.

So as we celebrate the vibrancy of India's radio and television in media and entertainment industry, I would like to recall the pivotal role that has been played by Telecom Regulatory Authority of India, that is TRAI, in shaping this sector. Just to recapitulate, India's broadcasting landscape currently comprises of nearly 330 broadcasters, 995 registered MSOs, one HITS operator, and four DTH operators, besides the free-to-air DTH service that is DD Free Dish, which is owned and operated by Prasar Bharati, the public service broadcaster. Further, a few IPTV service providers are also providing a variety of options to consumers to access TV and radio channels.

The advantage of the multiplicity of technologies and the numerous players has been the competition in the sector and consistent improvement in the quality, wider choices, and affordability to the consumers. As you know, TRAI is a statutory body set up by an Act of Parliament in 1997, and the functions related to regulation of broadcasting and cable services were entrusted to TRAI from 2004. Ever since, the objective of TRAI has been to create and nurture the conditions for orderly growth of these sectors in the country.

Looking at the advantages of digital cable TV networks, TRAI in 2010 gave its



recommendations to the government for implementation of digital addressable cable TV systems, that is DAS, across the country. The government accepted TRAI's recommendations and amended the Cable TV Networks Rules 1994 in April 2012, mandating implementation of digital addressable cable TV systems by MSOs across the country. Completion of the process of digitalization necessitated a new set of regulations. Therefore, in March 2017, TRAI introduced the new regulatory framework comprising of tariff order, interconnection regulations, and quality of service regulations. This new regulatory framework is based on four core principles, that is transparency, non-discrimination, protection of consumer interest, and enabling orderly growth of the sector. This framework significantly promotes consumer interest, making the choices available to consumer and consumer paying only for what she wants to see. This encourages market forces to improve the quality of TV channels with better consumer viewing experience.

During the last 2 years, TRAI has come out with various significant recommendations for the growth of the sector, with due consultation process. Several key recommendations were released, which include renewal of MSO registration, ease of doing business in telecom and broadcasting sector, community radio stations, promoting local manufacturing in television broadcasting sector, market structure competition in cable TV services, license fee and policy matters of DTH services, FM radio broadcasting, and on low-power small range FM radio broadcasting.

The latest technological advancements in the Indian broadcasting sector like unicast-based IPTV for personalized content delivery, D2M technology for efficient content distribution, OTT services for on-demand content accessibility, gaming integration for increased viewer engagement, artificial intelligence for optimized content recommendation, and use of AI in production-related processes, and AR/VR for immersive experience, all these collectively offer significant opportunities for growth. These innovations enhance viewer engagement, this expands audience reach, enables diversity in content offering, and it also improves the content discovery, ultimately driving revenue growth and competitiveness in the market. This also means rapid convergence of technology in offering services of telecommunication, information technology, and broadcasting. By leveraging these technologies, industry can cater to evolving viewer preferences and tap into new revenue streams and deliver enhanced entertainment experience.

This is bringing in new dimensions in regulation as well. Based on references received from the Ministry of Information and Broadcasting, TRAI has initiated a pre-consultation process on the National Broadcasting Policy, seeking valuable insights from stakeholders on various critical aspects of the media and entertainment sector, including public service broadcasting. TRAI is committed for fostering a robust broadcasting ecosystem that prioritizes content quality, ensures availability and affordability of content, enhances global reach, promotes local content, and bridges the skill gap. It should also augment our R&D capabilities with focus on indigenous manufacturing and address the challenges of



piracy and content security.

As we move forward, we are preparing a detailed consultation paper to get the specific views to shape a comprehensive National Broadcasting Policy for India. The government has, in November 2023, also released a draft Broadcasting Services Regulation Bill 2023 for views or comments of the stakeholders on the proposed legislation. It seeks to replace the Cable Television Network Regulation Act of 1995 and other policy guidelines currently governing the broadcasting sector in India. The new bill will be advancing government's vision for ease of doing business and ease of living. It addresses a longstanding need for consolidation and updation of the regulatory provisions for various broadcasting services under a single legislative framework for the broadcasting sector and also deals issues related with OTT services, digital news and current affairs, as well with a unified, future-focused approach. It intends to address the dynamic world of OTT, digital media, DTH, IPTV, and more, promoting technological advancement and service evolution.

I wish the organizers and participants all the success in their endeavour in this conference, in the two days' deliberations that you will be having on this variety of subjects. Here in conclusion, I would like to say, as we navigate the landscape of broadcasting sector, it is imperative for us to harness the potential of technology, foster innovation, and adapt to changing consumer preferences. We should continue to propel India's broadcasting sector towards greater heights of success in alignment with our vision for a digitally empowered nation. Thank you.





# Mr. Anurag Singh Thakur

Hon'ble Minister for Information & Broadcasting

Shri Anurag Singh Thakur, the Honorable Minister for Information, Broadcasting, Youth Affairs, and Sports, Government of India, is a fourth-term Member of Parliament, Lok Sabha, from Hamirpur, Himachal Pradesh. Before resumption of this charge, he held the portfolios of Minister for State for Finance and Corporate Affairs, Chairman of the Parliamentary Standing Committee on IT, and member of the Public Accounts Committee. He was the youngest Chief Whip, Lok Sabha in the 16th Lok Sabha. He represented India at the Parliamentary Committee on WTO and the Steering Committee, is recognized as a Young Global Leader by the World Economic Forum, served as the National President of Bhartya Janta Yuva Morcha and was the only National President for three consecutive terms. He has been awarded the Sansad Ratan Award for outstanding performance as a Parliamentarian in 2019 and Champions of Change 2019 award for significant contribution towards social welfare. He's an avid sports lover and served as the President of BCCI.

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## Mr. Anurag Singh Thakur

Hon'ble Minister for Information & Broadcasting, Youth Affairs and Sports

## ADDRESS BY THE CHIEF GUEST

Dignitaries on the dais, Esteemed Guests, Delegates, Ladies and Gentlemen

A Very Good Morning to all of you , Namaste!

Standing before you at the 2024 edition of the Broadcasting Engineering Society (BES) Expo, I am immersed in the reverberations of an extraordinary voyage of the Broadcasting Industry. I can feel the pulsating atmosphere here - the past whisper in its wisdom, and the future beckons with a symphony yet unwritten. The very essence of this Expo lies in the call to action, an invitation to reshape the media landscape through innovation, immersion, and sustainability practices leveraging upon the combined wisdom of broadcasting professionals, media trailblazers, and visionary leaders. It is a harmonious symphony that reverberates with the accomplishments of the past, composing the melody of a bright and promising future.

At the forefront of this transformative journey stands the Broadcast Engineering Society (BES), a beacon of technological advancement and innovation in the field of broadcast engineering. Through its annual Expo over the last two decades, BES has provided a platform for industry professionals from around the world to converge, exchange ideas, and push the boundaries of possibility. It has been a catalyst for progress, drawing together the best broadcasting stakeholder minds from India and abroad. The Expo serves as a testament to their dedication, continuous pursuit of excellence, spirit of collaboration, and ingenuity that propels our industry forward.

Our National Public Service Broadcaster, Prasar Bharati, has played a pivotal role in shaping the narrative of our nation. From the grainy black-and-white screens of Doordarshan to its HD avatar today and Now we have 4K digital transition, from analog Medium Wave to DRM and now FM of Akashvani, the diverse programming of Doordarshan and All India Radio has informed, educated, and entertained generations of Indians. From the analog era to the dynamic digital landscape of today, our broadcasters have traversed a path marked by resilience, innovation, and unwavering commitment to excellence. In this grand tapestry of progress, we must also acknowledge the pivotal role played by Prasar Bharati, India's largest public broadcasting agency. Drawing inspiration from the Atmanirbhar Bharat vision of our Hon'ble Prime Minister , Shri Narendra Modi Ji, it is imperative that we must strengthen our Public Service Broadcasting (PSB) to provide quality content that caters to the diverse needs of our nation. India must carve its unique path, recognizing the rich canvas of our cultural heritage. Initiatives such as Prasar Bharati's leadership in DTH space,



its advancement towards HD and 4K telecast of Pran Pratistha Samaroh of Bhagwan Ram at Ayodhya and also the spectacular coverage of G-20 and the Republic day year after year, echo the progressive efforts made by India's public service broadcaster to meet the demands of the digital age media consumption both at national and international level.

With its vast network of Doordarshan and AIR, Prasar Bharati and its tireless efforts to adapt to the evolving technological landscape have ensured that it remains relevant and impactful in the digital age also. Prasar Bharati continues to carry the torch, bridging cultural divides and connecting our vast nation through the power of electronic media.

Behind the scenes, the Ministry of Information and Broadcasting has been a steadfast guardian of India's broadcasting industry, steering it through the winds of change with wisdom and foresight. Its unwavering commitment in promoting public service broadcasting, designing and implementing inclusive policies, and media literacy initiatives, and encouraging private participation in the broadcasting and media industry has laid the foundation for a vibrant, inclusive, and resilient broadcasting and media ecosystem in India, which is diverse, informative, and responsible.

As we celebrate the past, our gaze remains firmly fixed on the future. We stand at a crossroads, where technological advancements present both opportunities and challenges. The demand for high-quality, personalized content across multiple platforms is surging.

Developing the latest generation of broadcasting equipment has become an imperative. The clarion call by our Hon'ble Prime Minister, Shri Narendra Modi Ji for "Make in India" resonates powerfully in this context. We must encourage indigenous R&D, nurturing our scientific talent and fostering partnerships between industry and academia. As Dr. A.P.J. Abdul Kalam, the visionary scientist, rightly said, "Dream, Dream, Dream. Dreams transform into thoughts and thoughts result in action." Our actions today will determine the success of our dream for self-reliant broadcasting.

The New Direct to Mobile (D2M) technologies offer exciting content possibilities for terrestrial broadcasting not only to television but also on handheld devices- Mobile phones, pads, etc on an "anywhere, anytime" basis, and that too without the need for the internet. We must explore and embrace innovative options of broadcasting like Next Gen broadcasting which shall not only ensure wider reach to cater to all strata of our society but also serve as a catalyst for ever-evolving user experience.

Green broadcasting is not just a fad, it's a moral imperative. As Mahatma Gandhi, the father of our nation, urged, "We must become the change we wish to see in the world."

In our pursuit of progress, let us not forget our responsibility towards the environment. Embracing sustainable practices in broadcasting operations is not just a moral imperative



but a strategic necessity too. By minimizing our carbon footprint and reducing waste, we can lead global initiatives like ABU's "Green Broadcasting" project. India's research and development in solar-powered broadcasting equipment and energy-efficient studios position us as leaders in sustainable broadcasting, reflecting our commitment to environmental stewardship.

In an increasingly interconnected world, safeguarding data privacy and the security of sensitive information is of paramount importance. India's efforts in developing indigenous cyber-security solutions underscore our commitment to data security, aligning with global Data Protection regulations. As we harness the power of technology to drive innovation in the broadcasting ecosystem, let us ensure that we prioritize the protection of sensitive information and also not forget the steps required for the integrity of our digital infrastructure.

In the age of information, promoting media literacy is paramount. Empowering citizens to navigate the complex landscape of digital media is the need of the hour. Government of India's initiatives such as "Digital India" and "Pradhan Mantri Gramin Digital Saksharta Abhiyan" bridge the digital divide, ensuring that broadcasting technologies reach even the remotest corners of our nation. As we embrace the digital revolution, let us empower our citizens with the tools they need to critically engage with the media and make informed decisions.

My dear friends, it is important to invest in Regional Content and Languages. India's linguistic diversity is our strength. Supporting regional languages and fostering hyper-localized content is essential not only to compete with global platforms but to achieve the larger goal of providing equal opportunity to all for contributing to the nation's success. The expansion of the Film and Television Institute of India's regional campuses emphasizes our commitment to multilingual content creation. As we invest in regional content and languages, let us celebrate the rich tapestry of our cultural heritage and amplify the voices of every corner of our nation.

Two examples I would like to quote here ; On one hand we have one of the most populous Sports leagues in the world - the Indian Premiere League the IPL . When they started telecasting in the regional languages , their audience, their viewership has actually increased. And if you look at the content created in the regional languages , whether it is the regional films , there is nothing regional today. With the use of technology it goes quickly if the content is good from the regional to the national and then to the International level and they have made the waves in the past and they are going to make the waves in the future as well. So the emphasis should be on the creating of awareness about the technology , use of good technology, less carbon emissions , at the same time a good content creation which can reach out to the various nooka and corners of the world.

The media landscape is undergoing a metamorphosis. Consumption patterns are changing



rapidly, with audiences' tastes migrating to OTT platforms, demanding personalized content. We must acknowledge this shift and adapt accordingly. As Chanakya, the astute strategist, advised, "Change is the law of nature. Only the fittest survive." Our content creation strategies, latest technology adoption, regulatory frameworks need to evolve at a rapid pace to remain relevant in this dynamic environment.

Content regulation also requires careful consideration. Striking a balance between freedom of expression and upholding societal values is paramount. As Rabindranath Tagore, the revered poet, envisioned, and I quote "Where the mind is without fear and the head is held high... knowledge opens out like the perfect blossom." I unquote. We must foster an environment where creative expression thrives within reasonable boundaries, ensuring responsible and ethical content.

My Dear friends , as I have been told , there are about 1000 registered delegates, 42 exhibitor companies from India and abroad, conference has 26 CEOs , 12 Vice Presidents and more than 20 experts speaking on various issues like content, technology, deep fake, OTT, Spectrum etc. regulation . In the end as we move forward , let me say this , collaboration remains the key. We must leverage the collective expertise of broadcasters, technologists, content creators, policymakers, and academia to write the next chapter of India's broadcasting.

Let us work together, inspired by the achievements of the past, to compose a future where Indian broadcasting stands tall on the global stage. Let us create a symphony of innovation, self-reliance, and sustainability, echoing through the airwaves and enriching the lives of millions and millions.

The BES Expo serves as a perfect platform for this critical collaboration of sharing wisdom & knowledge, exchanging ideas, and forging partnerships that will shape the future of the broadcasting industry.

If I have to quote 2 examples of the recent past , 5 years back India was the second largest importer of the mobile phones. With the production linked incentive policy and the Atmanirbhar campaign , India has become the 2nd largest mobile manufacturer of the world in just 5 years span. If you look at the toys industry, we used to import about 90% of the toys from outside . Today , 87% of toys are Made in India and our export has increased 4 times. That is how the things change with the Atmanirbhar campaign . We have shortlisted 14 areas for the production linked incentive schemes, and I am sure broadcasting industry will see lot of investments, lot of collaborations , technology partnerships, academia will also come forward for the future innovations, and I am sure India is going to become the hub for the broadcasting industry.

I will wait for the report , what transpires in various sessions, so that we can also go through that , make the new policies, make the new laws for you so that you can also come and



invest in India , make in India and export to the world from India. And I am sure that can happen in the near future.

So today, on this journey of transformation and progress, let us dream boldly and act decisively to shape the future of our industry.

I congratulate the organizers and wish BES EXPO 2024 a grand success.

Jai Hind, Jai Bharat Jai Siya Ram.







Inauguration of the Conference by Mr. Anurag Singh Thakur, Hon'ble Minister for Information & Broadcasting Youth Affairs and Sports, with Mr. Sanjay Jaju, IAS, Secretary, I&B, Gol, and Mr. Gaurav Dwivedi, IAS, CEO, Prasar Bharati





## **SESSION 2**

ATSC 3.0 Broadcasting Technology for Atmanirbhar Bharat

#### **SESSION CHAIR**

**Ahmed Nadeem** Secretary General, Asia Pacific Broadcasting Union, Malaysia



Ahmed Nadeem assumed the role of the seventh Secretary-General of the Asia-Pacific Broadcasting Union on April 1, 2023. Previously he led the ABU Technology Department from 2008. Before his current role, he served as the Director of Technology and Innovation from May 2018 to March 2023. With over 25 years of expertise in broadcasting and telecommunications, Mr. Nadeem is a distinguished engineer in electronic and information technology.

Mark Corl Senior Vice President of Emergent Development Technology, Triveni Digital



As the senior vice president of emergent technology development at Triveni Digital, Mark Corl focuses on strategies to address the disruptive changes in TV technology caused by the continuing exponential advances in computing and networking. He is a former ATSC board member, chair of the ATSC India Implementation Team, chair of the ATSC Caribbean Implementation Team, and chair of the ATSC 3.0 Specialist Group on Interactive Environment, contributing extensively to ATSC's efforts worldwide. An expert in the digital TV industry with nearly 30 years of experience and extensive contributions in product engineering and architecture, Corl has an unparalleled knowledge of ATSC 3.0. Prior to Triveni Digital, Corl acquired 15 years of software engineering experience at leading companies such as Texas Instruments and Xerox Corporation. Corl holds a B.S. in Mathematics and Computer Science from Bucknell University.





Mark Simpson CEO and President, Triveni Digital

Mark is the founding president of Triveni Digital, formerly LG Electronics Research Center of America. Mark has extensive experience building and leading teams that developed cutting-edge embedded systems and imaging technology, with an emphasis on commercial applications. Prior to Triveni Digital, he held R&D management roles at Adobe Systems, Apple Computer, and Xerox. Mark has a Ph.D. in Mathematical Logic and Computability Theory from Cornell University, and a B.S. in Mathematics from SUNY at Binghamton.



**Ralph Bachofen** Senior Vice President, Sales and Marketing, Triveni Digital

Ralph Bachofen brings 30 years of experience in ATSC and IP technologies to his role as vice president of sales and marketing at Triveni Digital. He is a proven leader in the broadcast industry, skilled at business planning and case development, sales, distribution channel marketing, and selling to executives of Fortune 500 companies. Prior to Triveni Digital, Bachofen was the manager of product marketing at Conexant Systems, a semiconductor company driving broadband communications for the digital home. His professional career also includes senior technical and marketing roles at Siemens and Accelerated Networks. Mr. Bachofen has an Executive MBA and a Bachelor of Science degree in telecommunication technologies.

28th International Conference & Exhibition on Broadcast & Media Technology

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28th International Conference & Exhibition on Broadcast & Media Technology

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Theme: Evolving Media Ecosystem: Innovative, Immersive & Sustainable Broadcasting

15-17 February | Hall 12A, Pragati Maidan, New Delhi

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**Mr. Ahmed Nadeem:** Namaste, good afternoon, alaykum. Thank you for the kind introduction, welcoming you all back after that long break and a good lunch, starting with the first session of the BES. We have here three colleagues from Triveni Digital who are joining me, three esteemed colleagues Mark Simpson, Mark Cole, and Ralph. What we'll try to do is we'll try to go through some presentations on the work that Triveni is doing, specifically on ATSC3 implementation, and then we will open the floor for Q&A,.

Just taking the discussion of this morning's inaugural session forward, what we have heard from the Minister, the Secretary, and the Prasar Bharati CEO are very similar to the kind of challenges, although they were discussing the perspective of the Indian scenario. But coming from the Asia Pacific Broadcasting Union, from the ABU's perspective, we cover the whole region and to some extent beyond the region also. The challenges and the opportunities that are present in the current ecosystem is very similar around the world. So when you're looking at the way digital technologies are evolving, and especially the kind of competition that are coming out in terms of OTT presence, in terms of internet delivery of media, it's very important, especially for public service broadcasters, to be up in par with what's going on.

It's very difficult in the sense that we don't have, as broadcasters, that kind of resources that are available to those internet giants. But I think it is very important to understand that what is driving this scenario is actually technology. But the truth of the matter is that these technologies are available to any organization that wants to adapt it. But if you really look at the bigger picture point of view, all these OTT technologies that are coming in, what all of them want is content. And that is what the Minister also highlighted this morning. There's a huge demand for content, there's a huge demand for local content, creative ways of developing content, creative ways of addressing the audience.

So what remains unchanged in this whole ecosystem, the way it is changing and evolving, is that even earlier and even now, what broadcasters want is the eyeballs. We want the attention of the audience. And I think from the sustainability point of view and from what this morning discussed about the efficiency of using spectrum, this is where technologies like ATSC come into place where you are able to provide and continue to provide broadcasting signals free of charge, free to air to all audiences.

**Mr. Mark Simpson:** I would like to briefly answer a couple of questions: Who is Triveni Digital? What do we do for this audience? For this audience more importantly, probably, why are we named Triveni?

So, we started as an R&D Center for LG Electronics more than 25 years ago and realized we should sell products in this Advanced television space. One of our Indian employees suggested the name "Triveni," sounded like a good idea. It kind of means convergence, hence Triveni Digital. We're now employee-owned and have been for a while.

I think that our core markets are sort of important. We get a lot of experience from these



markets. We've been operating in the television broadcast market and cable markets for all our time, and these products are related. We have a number of products that are MPEGbased, the old legacy systems, ATSC 1, or DVB-S types of systems. The core categories, I guess you could call it, are test and measurement or specifically monitoring and analysis for these complex data flows that go through broadcast television and cable. We do things like transport encoding and metadata systems, and also content distribution. So really, data broadcast supporting platforms. And across all these categories, we are actually the market share leaders in the US, including in ATSC 1 and 3. So we are very expert in broadcast technologies and television distribution technologies.

We saw ATSC 3 as an important new technology platform for the industry, and we have devoted all kinds of resources to it. In fact, our former Chief Science Officer led the ATSC 3 standard development process. Sometimes they try to call him the father of ATSC 3 because of that, Rich Chernock, some of you may know.

A couple of things that make us different, I think, is our technology leadership, but also we focus very much on partnering. We think that no one can do it all. We want to, however, be the best at what we do, and that includes partnering with other ecosystem players. So hey, we're very interested in forging more relationships here in India while we're here. I guess one thing I also want to just say is thank you for having us again. You've made us feel at home. Of course, that's pretty easy when I look out at the audience, I feel like I'm in my neighborhood in New Jersey, pretty much the same demographics anyway.

**Mr. Mark Coral:** So there's been a lot of uh discussion today about media and and television and basically driving media into uh homes using broadcast technology. Of course, this has been happening for many many years. Um, and what this talk is about is more how you can use this technology, this newest technology, to do other things. Um, my name is Mark Coral, as you can see from the slide. I'm SV, senior vice president of Emergent Development Technology. But the other hat that I wear is I'm the chair of the Interactive Group for ATSC 3. I also was the chair of the implementation team that did the proof of concept here in New Delhi and currently, I'm the chair of the Caribbean implementation team, which is working on uh, deployments into the Caribbean. And Ralph will talk a little bit about what some of those deployments are.

So, I like to say that if I don't know what's in the ATSC 3 standard, I know somebody who does. So if you have any questions whatsoever about ATSC 3, please contact me and we can talk at length about the standard and what is in the standard, what the standard does, and all the aspects of the standard. So I'm going to go through a little bit of a summary of ATSC 3 first, and then I'll show some examples of things that aren't necessarily media, but are things that we're doing in the US and Canada and some other places to actually take advantage of the technology. and again, this is a technology play that I think is just um, sort of tailor-made for a deployment into a large population. Um, I think broadcast has infinite scope. I mean, you can expand it as much as you want. There's, you put the



signal on air, and as many people that can cont look at it can look at it. There's really no limit whatsoever. So, in some respects, it's an infinite bandwidth system.

So, broadcasting, what we did with ATSC3, uh, it's really the internet age of broadcasting. So, the physical layer uh, has been demonstrated as the essentially the world's most efficient one-to-many DTT system. Uh, it's very close to the Shannon limit. There are multiple, what we call mod cods or modulation settings, and it's been tested and shown to be very, very good and very easily received. Probably one of the most unique things about the standard at this point is its IP-based protocol. Um, it's based on essentially everything that is IP multicast, and the protocols that it uses. There's an MMT protocol from MPEG, as well as a ROUTE-DASH protocol for carrying files, and we'll talk about that here in a minute. Video, we've, and there's a bunch of acronyms here, but essentially it's better quality video. Uh, we used HVCC, HVBC, uh, H.265 as their standard. We've just recently put a what's called a candidate standard in place to deal with BBC. So, think of atsc3 in many respects as a toolbox, and you can use that toolbox to deploy whatever technologies you want to deploy and make things your use cases.

D2M is one of the use cases here. Uh, it's focused on mobile or, uh, in the home receivers, and you can set up the system to do that. Uh, it can do other things as well. It can do, uh, the Koreans are using it to do, um, 4K, um, and many in the US will want, once they actually start to expand more, uh, audio immersive audio, um, personalization using DOL AC4 and MH audio. Um, you can use either. It's regional as the choice. Again, it's a toolset. Um, the US chose AC4, that region. Um, Korea chose MPEG-4 or MPEG-H. I'm sorry. Applications, which I'm very familiar with having been part of developing that standard. Um, there's web-based interactivity. Essentially, it's, you develop a web app, and it runs on a television, and so you can layer that on top. And there's a set of APIs that we use from the JavaScript that can control the television and do things with the television, push backs, a variety of different things.

So, accessibility. There's a lot of features about accessibility in the standard. Uh, we have closed captioning based on IMC1, uh, which is a TTML standard. Uh, time text standard is what TTML stands for. Um, but there's also new capabilities for visually and hearing impaired audiences. Very, very key to the standard. Um, and emergency messaging. Um, we have a variety of ways in the standard to carry, uh, not only just a single crawl or audio information about an emergency but all kinds of emergency information. Uh, there's even a wakeup bit in the what we call a wakeup bit in the, in the beginning of the signal in train that would tell a receiver it's time to wake up. There's emergency information for you to pay attention to, and you could actually have the receivers turned on if that such a thing was enabled. Um, emergency messaging is key in terms of reaching your audience, a broad audience, um, that isn't necessarily going to have access to other types of communications.

So, a broadcast, a single tower, usually they're very robust in terms of infrastructure and having that tower is is something that can be very helpful in emergency situations.



But one of the things that we were really focused on and continue to be focused on in developing the standard was evolvability, the ability for us to extend features over time and add features over time. The BBC Kodak is an example. We've just recently added that as the candidate standard, um, but we can add other technologies as well. There's, uh, some signing activities that we're doing in collaboration with Brazil. Uh, there's another of other things that we're working on, um, that allow the standard to be extensible, um, and there's even mechanisms in the system to signal if we actually went to a new standard for frames for the physical layer. So, this is a little bit of an example. These slides are from PBS North Carolina. You'll see at the bottom there's attribution there, um, and this was really an example of going what essentially is atsc1. We call it. It used to be called HDTV. We've now moved it to atsc1 because there's now an atsc3. There was an atsc2, uh, but it really wasn't widely deployed. It was mostly experimental, and atsc3 had already started at the time we started to do that. Um, so that's the standard in atsc1 is 8SB, and you can think of that is similar to DVB-T. Um, so there's similar technologies. EG2-based transport stream, and you can carry this is what they're carrying in uh, PBS North Carolina currently on the current broadcast in the United States.

And really what I wanted to show with these slides is really the pipes inside of this. So, they've got 16 megabits a second that they're using for their video in the studio, and they're carrying that on this channel. So they've got six channels of TV coming out of this facility, and then they've got several channels of audio. They've got a couple of radio channels that they're carrying, and then they've got a variety of IP connections, um, that are leaving the facility as well. Uh, they're carrying what we call a metadata service. They're carrying an EPG service. They're carrying the PBS backbone network out of this facility on the same, uh, same channel. And so it's a very efficient use of their bandwidth. And again, they're using 8SB, which is a, uh, 2K mode technology. There's several other modes, um, that they can deploy, and I'll show some of those here in a minute, but this is a real-world example of how you can use the pipe that's inside of this to do other things.

So, if you think of a TV station, a TV station has a transmitter. Uh, that transmitter goes up on the mountain, and it puts out its signal, and you can receive it in your home. Um, it's an over-the-air signal, and that's why we call it over-the-air television. Um, and atsc3 takes advantage of that, and it adds to that, it takes it to another level. Um, and this was our proof of concept in Delhi. Um, we had four different sites that we were transmitting from, one at the uh, broadcasters house, one at the government, uh, excuse me, the, the tower location. We had one on a test, uh, at NAB, uh, and we were transmitting that up to the mountains in the Angeles crest, and we were actually using it on the road on a variety of receivers. Um, and then we had another transmitter that was mobile that we used. We did remotes at the NAB show in 2016 with this technology. We transmitted from the floor of the show floor at NAB, uh, back up to the mountain, and then we received the signal back down in the, in the booth at NAB on a variety of receivers.

So, uh, it's really, uh, one of the beauties of the standard is it can really go from the tower



to the home, and you can do a variety of different things with it, uh, along that line. So, let's talk about the IP part a little bit. I'm an IP engineer. I'm an I engineer. Uh, the, uh, the packet technologies and the, and the development that was done here is very, very advanced. Um, and what it does is it essentially takes a standard packet, and it adds a header to it that's called ROUTE. Uh, there's other parts to it as well, but essentially, it takes this ROUTE header, and it puts it on top of the packet. And then it sends that over the air, and it's like a data packet. Um, so you can, you can think of it as that's, you know, it's bits. It's bits in the stream, and the TV just pulls it off, and then it renders it. Um, the, the ROUTE header is on there, uh, and it's retransmitted in a variety of places, um, in the cloud, and all the way to your home.

And then in your home, the TV just takes that ROUTE header and hands it to a ROUTE server, and the ROUTE server goes and gets the data, and it gives it to the TV. And that's how it all works. Um, it's, again, very efficient. The, the the, uh, usage of the, of the bandwidth is very advanced, uh, and it allows us to do a variety of things, like run, um, you know, high-quality video on, on, in a 6 megahertz channel. Uh, there's, you could put, I think it's three 1080p channels in the same channel. So, let's talk a little bit about routing. I'm going to take you through the routing process and how we do this. So, um, at the studio, there's a piece of software. I think in the standards it's referred to as an mm gate, but it's essentially a route server. And what it does is it takes the video and, and the video is then encapsulated into a file. Um, and that file is then ingested into the server, and then the server puts it into the broadcast. And then it sends it out over the air, and then it's received on a variety of different devices. In this case, uh, we had an encoder, um, that was taking that signal and taking it down to the internet, and then it was transmitted over the internet to the various receivers, um, in the, in the coverage area. So, we had a server that was running, uh, what we call a broadcast gateway.

And then we had a variety of different devices that were receiving that, um, the standard is very unique, and it allows us to have, uh, the essentially multicast is natively supported. So, we can have a whole bunch of devices that are receiving this broadcast at the same time. So, it's a lot different than a unicast, which is like a YouTube stream, where you're receiving that stream on your own, uh, and it's not really efficient. Um, you can actually take this and, and with, with atsc3, you can actually take this signal, and you can have, uh, you know, hundreds, thousands of devices that are actually getting that stream at the same time. So, it's very, very efficient. So, uh, let's talk about receiving a little bit. The, the receiver, I think I mentioned earlier, is a ROUTE server, uh, and that ROUTE server, there's a very minimal piece of software that's actually running on the ROUTE server that gets that header, that ROUTE header, and hands it to a ROUTE client. And then the ROUTE client goes and gets that video. It says, "Oh, it's on the internet," so it, it goes over the internet, and it goes and gets the video and then presents it to the TV.

So, uh, what I wanted to point out here was a little bit about, uh, the multicast nature of



the, of the broadcast. Um, the multicast can be supported either in what we call the FDT flow descriptor type, which is more of a file delivery type of, um, multicast. It can also be delivered as a live stream. Uh, you can see in this example, it's, um, I'm looking at the slides, uh, actually, uh, sorry. Um, it's, it's carried as a live stream. So, you can see, um, in this particular, um, example that the FDT is a little bit different. Um, but there's, there's essentially a file identifier, and then there's a content identifier. The content identifier says, "Hey, this is a live stream. It's, you know, on a, on a web page, or it's on a, you know, a broadcast network." And then it's transmitted from there to the home. And then in the home, again, uh, the ROUTE server takes the header, and it goes to a ROUTE client. In the case of this, this particular example, the ROUTE client is running on the same device as the server. So, it's, it's kind of, um, a little bit different than some of the other ones. It, it can also be running on a device that's separate. So, it could be like a, uh, a box or it could be a, a stick that you plug into the back of your TV.

And, um, then that client goes and gets the video, and it says, "Hey, this is the file identifier. Uh, where is this file?" And then it presents that to the, to the, uh, to the TV. So, I hope that makes sense. It's, it's a very, um, very efficient way to do, um, routing. It's, um, it's just bits in the stream, and then the TV takes it and renders it. And that's the end of my, my presentation. So, hopefully, uh, we'll have some questions and, uh, be able to answer them. So, I hope that helped. So, thank you very much.

**Mr. Ralph Bachofen:** Yeah, of course, and thanks for having us here. So, it's really great to learn from you all in regards to what your thoughts are about broadcast technologies in India. So, we learn a lot from you guys and the input. What I want to talk briefly about is it's actually really an international standard, and not just the standard, but it's actually deployed internationally. So, the first country who actually implemented ATSC 3.0 was South Korea. So, it's actually deployed there and heavily used. Their main use case was 4K, as you heard from Mark Coral. Use cases are infinite. It's IP-based; you can do whatever you want with a standard based on, of course, the bandwidth you have. You don't have infinite bandwidth, but you can imagine anything you can do.

So, South Korea was heavily focused on 4K delivery of content. In the US, at this particular point in regards to deployment, we are, the official number is 80% of people reached in the US, but I think Chicago just went up and Philadelphia just went up. So, I think we're probably closer to 90% of the US population reached by ATSC 3.0. The deployment scenario is a little bit complicated there because we have to maintain ATSC 1.0; that's from our FCC regulatory topic. But now we're entering the next phase of ATSC 3.0, and we're looking at applications like PBS or emergency alerting, these kinds of things which we can utilize the broadcast technology as well within that infrastructure.

I'm going to give a little bit of an anecdote here because it's near and dear to me. Yes, emergency alerting is important and so forth, but I grew up in Switzerland, and I'm still really heavily involved in football or in the US, we call it soccer. And I love to see my Swiss



national team losing against Brazil, for example, in the World Cup. It's just my favorite, but at least I would like to see that in my own language, in my mother tongue, which is Swiss German. So, ATSC 3.0 can actually deliver me that content, that moderator, or the commentator in Swiss German, and I can select that language. So, I have multiple choices of language. Of course, that's never going to happen because there's only like five people in the US who speak my language, so never ever is that bandwidth going to be used. But you can deliver that over the internet, right? So, and I just going to put a pin in that for a minute because I'll come back when we maybe talk a little bit more about India.

But you know, these kinds of applications you can implement with ATSC 3.0. The other countries, and Mark mentioned some of those, Jamaica is actually a very interesting use case. They went directly from analog to digital with ATSC 3.0 and they're heavily focused on educational data casting but also emergency alerting. It's the Caribbean, and if you have been there, the weather can be really nice, but it also can get really bad really fast with hurricanes. So, alerting, the alerting system is very near and dear to them. So, they have implemented alerting systems around the ATSC 3.0 technology, similar actually with Trinidad and Tobago. It's another Caribbean island, same concept there. And actually, what was missing on your resume, you are also in the Brazil ATSC 3.0 implementation team, which I am as well. So, we're focusing heavily on Brazil.

Brazil chose ATSC 3.0 at this particular point. I would say almost everything in ATSC 3.0 except the physical layer, so that's still ongoing in regards to testing what they want to select. In this regard, but they're actually very close as well in selecting ATSC 3.0 as a broadcast standard. What else did I miss in regards to countries? I think we're yeah, Canada. Canada is really not deployed, but you know, then we also can say it's deployed. What we do there is that we work very closely with Her University, which has actually a broadcast lab focusing on xgt and um, they have a stick in Toronto, and you know, Toronto's population is actually pretty large, so they can reach many, many people in Toronto, and we do a lot of really nice technology research with um H um um technology in in Canada. And then maybe we talk a little bit about you know India as well. Maybe we do that offline as well.

You know, D2M is an interesting concept, but what really you know was very interesting this morning from the talks was you also have many languages, which brings me back to my Swiss language. It's not that it's a language here, but what you can do is if you have a cricket match, that now allows you to have multiple languages on that cricket match or even the local commentator within that TV stream, which then engages the whole population much more instead of just, you know, a certain area of population. So, the fact that ATSC 3.0 is IP-based and has a much better compression environment allows you to augment your broadcast stream with additional either revenue streams or with things you can improve the population's well-being. And that's kind of the things we would love to talk with you about and how you see the deployment going forward here in India.





## **Tutorial : Building OTT platforms-Key considerations**

Mr. Vikrant Khanna, CEO, Mogi I/O

Vikrant Khanna is the founder CEO of Mogi, Media Tech Venture is spiralling its powerful tech IPS in the modern media environment and its a patent in buffer free video streamline. Vikrant Khanna is a seasoned P&L leader with 20 years of experience with his companies in Bharti Airtel where he is the V.P of Digital and Homeshop 18.

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### Mr. Vikrant Khanna

CEO, Mogi I/O

## TUTORIAL

Good afternoon, everybody. It's a privilege and an honor to be here today at this august gathering. My name is Vikrant Khanna. I'm the founder and CEO of Mogi IO. We are a media tech startup dealing in AI mediatech and we have an OTT platform. So the topic for today's presentation is building an OTT platform. What are the key considerations? Obviously, it's a very vast topic, a complex ecosystem that we are talking about here. And the time that I've been given is only 30 minutes. So I will try and do justice to it by focusing on the width of it rather than the depth of it. So please pardon me if I miss out on some details in terms of depth. But we are here for the next 2 days as well, and we have a booth out here. So please feel free to reach out to us and happy to answer any queries.

So what we'll try and do today is, in the next 30 minutes, there are two tracks that I'd like to run here. The first one is to talk about the key considerations in building an OTT platform. The second track is that we would like to actually do a demo here. My team will actually try and show a demo. Is that demo going to be possible? Can you bring out that screen, please? Okay, great. Yeah, so I'll probably request you to do multitasking while you can keep your eye on the presentation on the screens on the left and right. The center screen is going to be the demo part where my team is actually going to be building an OTT platform in real time for you. We've taken the liberty of taking Doordarshan Prasar Bharati as a case study here.

What we have done is we've already pulled out the content from YouTube. So a lot of videos have been pulled out from YouTube already, and we've also created the thumbnails. So these are the only two things that we have done beforehand, and the rest of the process will actually take place in front of you in real time. So let's get started. The agenda is that, you know, what is an OTT platform? Very basic question. What are the critical components, why are the OTT platforms proliferating? Front end, backend, CMS, streaming infrastructure, monetization, and more. So that's what we will cover today.

Very basic question, what's an OTT platform? I think we all know the answer. It's a service that offers digital content through the internet, whether it's on demand or live, and across all the devices you can possibly think about. Common perception is that OTT platforms are only limited to entertainment, sports, or news. But today, we have all kinds of use cases which are emerging. There are educational platforms, schools, and colleges are launching their own digital magazines. The earlier day and age where you had the school and college magazines published on hard copy and paper are transitioning to a digital video magazine. That's also another form of OTT. There are PTI spiritual and religious OTTs, which is a very,



very large use case. There are fitness and health-oriented OTT platforms, and even brands are actually launching their own OTT platforms across the world. So it's a very versatile sort of a use case which is emerging.

The key question is why are the OTT platforms proliferating? The answer is simple: the future of text is video. If you look at a lot of consulting firms, leading global consulting firms, their research suggests that whatever is in the text form today will eventually convert into video. If you look at the whole pyramid of society today, if you go down the social-economic strata, the lower you go down in the social-economic strata, the propensity to read the written word goes down, while the propensity to consume videos goes up.

Similarly, when you talk about the younger generation, the Gen Zs and the Millennials, clearly the preference is to consume videos rather than to read. And there's a reason for this actually: the human brain processes the videos 40,000 times faster than the written text. And that's why probably in the US, in a recent study, I believe when kids between the age of 6 to 17 were asked what they would want to become when they grow up, 75% of them said they want to become video content creators. So that gives you an idea about the whole opportunity which is staring at us today.

What are the different segments and why are these segments launching their own OTT platforms? Globally, more than 24,000 TV channels exist. Cord cutting is a global phenomenon. Customers want to consume content at their own convenience, at their own time, on demand. Broadcast is a heavy capex industry. So these are some of the top reasons why TV channels are converting to OTT globally. 207 million content creators exist today, and this number is only increasing. As we speak, only 5% of them are actually able to monetize their content optimally through YouTube. And these content creators are now trying to straddle a multi-channel strategy, where YouTube is being leveraged by them for building their brand and getting the footfalls, while to sell their premium content, they are actually diverting the traffic onto their own OTT platform, which is branded.

In print media globally, 1.2 million publishing houses exist. But we all know that print is dying. These guys are also transitioning to launching their own OTT platforms. Similarly, there are schools, colleges, religious organizations, brands, and so on and so forth. Moving on to talk about what are the critical components at a very, very high level, I believe there are five critical components today. There is a front end, there is a CMS, there is the streaming infrastructure, there is the monetization layer, and finally, in new cutting-edge digital OTT platforms, there is the content enrichment, which is also emerging as a critical component of OTTs, leveraging Al.

So we will talk about each one of these five layers in more detail in the following slides. Front end, I think the basic baseline assumption is that your OTT will be present across all the devices you can possibly think about, whether it's a web app, Android and iOS, mobile phones, and smart TVs. Smart TVs are not just for stick, it's also Samsung, it is LG, it is



Apple, it is Roku, and more are emerging as we speak.

The baseline expectation is you will have long-form videos like what you see on Netflix, but there are newer forms of media which are also emerging as a customer expectation. Your OTT definitely needs to have the ability to create multiple channels supporting different languages, based on your customers' interest. The ability to create playlists, series, and episodes, and to have a player page which is very rich in terms of providing detailed metadata about the cast, and different kinds of playlist genre-based playlists, are all very baseline expectations in customers' minds today.

Language, region, or city-based selection, once again, is a very baseline expectation because customers expect a certain level of personalization. This is already there in the market, but I think what's emerging as a next-level expectation is things like short-format video because today, if you want to reach out to Gen Z and Millennials, you need to grab their attention spans. That's the reason why both YouTube and Netflix have introduced a short-form video section in their platforms. YouTube is, in fact, very strongly promoting it. Netflix is not, but I think it's only a matter of time. So, this is also becoming a critical expectation for any OTT platform today.

The next is music streaming podcasts because when the customer is on the go, they want to consume the content on the OTT this way. If you're traveling in the Metro, if you're traveling in a bus or in the airline, wherever you are, you can download the music, or you can just stream it live. Either way, we have seen that especially for BTI and spiritual use cases, for those OTT platforms, the streaming use case works very well. The other reason why short-form video is becoming very popular is because there is a pattern of viewership for long-form videos, which happens largely at nighttime, during the prime time, so to say. But if you want during the day consumption of content, then short-form video is very, very critical. You know, during the day, you know, whenever somebody has 10 minutes, 5 minutes, you just go to the OTT platform, consume your videos with a flick of a button, and, you know, then come back. You've had your break, and then you go back to your regular work. So, that's another consumption pattern that we are seeing. News and article support for those organizations which continue to straddle the hybrid content strategy, not just videos, but also text-based content, then event, and finally, live streaming. This is obviously a must.

Moving on to the second layer of the OTT solution, which is the backend CMS. Baseline expectation is that you should be able to create your own channels, playlists, series, episodes, upload your meta, do bulk uploads because, you know, nobody wants to, when you're creating an OTT platform, nobody wants to do this one by one. It has to be very intuitive for the content management team. The ability to customize your UI/UX in real-time.

Now, a lot of OTT platforms today, you know, are based on legacy systems, which are hard-



coded. What is needed is the ability to change your UI/UX. So, today, let's say if it is Diwali, can you change the UI/UX in real-time without having the need to push a new release for your customers? I think that's the customer expectation. With Payment Gateway Integrations, of course, you have to provide multiple payment gateways, not just for the Indian context, but the global context because your market could be, your consumer could be sitting anywhere. You could be having a popular language OTT, but your customer could be sitting in Morocco and Fiji. So, you know, you need to configure subscription plans accordingly, country-wise, currency-wise.

And of course, then there are third-party integrations, apps, flyer, social login, CRM, what have you. I've just given a very basic list here, but I mean each of these topics are actually very, very deep topics by themselves. I don't think I'll be able to do justice in the short span of time, so that's why I'm focusing on the width.

Analytics becomes a very, very critical part for customer attention. See, one important aspect about OTTs is that customer acquisition is relatively easier, customer retention is a huge challenge, and that's where your analytics comes into picture. Largely, I would put the analytics in four buckets: the operational metrics, the overall library level analytics, individual content level analytics, and subscriber level analytics. All four are critical. Operational metrics are obviously something which gives you the overall idea about how your platform is performing. Your MAUs, your monthly active users, your daily active users, what's your churn rate, what's your session duration, overall watch time, etc. Library analytics is, you know, gives you an idea about the viewerships at an overall level. Content-based is, you know, the title explains it very well. At an individual content level, you want to understand, you know, at what points in time are the viewership graphs dropping. Because that analytics becomes very important for further content creation, and when you design your content strategy going forward.

So, we've seen that in some bits of content, after 10 minutes itself, for let's say a 3-hour content, within 10 minutes, 80% of the viewership levels drop on the graph. So, that's the level of analytics which you actually need to ensure that your content strategy is stitched properly and you're not wasting money on your content and actually, tailor-making it as per what your customer preference is. Similarly, at the subscriber level, because at subscriber level, you want to identify who your heavy, medium, and low consumers are.

Moving on to the other critical part of the CMS, which is, subscriber management. I'm including this in the CMS because it should be embedded ideally in your CMS itself, from where your content team can actually run intelligent lifecycle marketing, create engaging web rules, have attractive custom pop-ups, exit and intent pop-ups, track the key growth metrics, view the final stages, issue promotional codes to those customers who are probably at the risk of being churned out, and do your campaign management across email, WhatsApp, SMS, etc., and even through in-app prompts.



Finally, the recommendation engine - I think this is the heart of any good intuitive OTT. All the personalization stuff that we're talking about is residing here and the reason why Netflix is Netflix is because, they have this really, really fantastic recommendation engine. Largely, there is a content-based filtering, which means if I'm a romcom lover or a thriller lover, then I get to be shown that kind of content. That's a very obvious one.

Collaborative filtering, which means people like, people like people who watch this kind of content also viewed this kind of content. So, there is a correlation which you can draw and recommend, you know, content based on collaborative filtering. And then Al is, of course, changing the whole game by introducing elements like psychography profiling, social media habits, visual preferences, and so on and so forth. It's a very, very deep topic and there are companies which are built only on this, specific use case.

Finally, talking about the video streaming infrastructure. Once again, a very, very, detailed topic. I will just cover the very basics of it. The first level is transcoding. Before you have to stream the content, you have to optimally transcode the content. And you have the standard codecs, H.264, H.265, AV1 is becoming popular, but it's largely between 264 and 265 right now in the market. CDN, it's obviously something which is of deep interest to any OTT owner because, finally, viewership leads to CDN consumption and that is equal to your Opex. And it's a very sensitive topic. Everybody wants to keep their CDN costs low because, finally, that is the most important part of your costs.

So, here, there are multiple strategies which new-age OTT platforms can use. For example, Mogi has a patent in buffer-free video streaming where we do what is called midstream client-side switching between the CDN. You can use a multi-CDN strategy for streaming. The first data, first few data packets, you can use category A CDN which will ensure your performance is very, very good. But, you know, once a certain amount of content is buffered, you can actually switch in real-time to a category B CDN where the costs could be highly optimized. So, as a blended play, you could actually get a phenomenal cost advantage while not compromising on the performance.

Today, I think we all know that Netflix and YouTube are the gold standards, so standard features like, you know, 10-second forward, 10-second backward, auto-selection of the bit rates or adaptive streaming, player control in terms of speed, subtitles, audio tracks, all that has to be inbuilt into your OTT platform and your video player. DRM, piracy protection, I think three popular strategies which are usually used are the AES, 128 encryption, screen recording protection, for mobile apps, and also dynamic watermarking. For example, Mogi does it using a QR code which is able to actually track back if in the case of any leakage, you are able to track back who the person is. Auto scalability, very critical, especially because today I think all the world-class OTT platforms are on a cloud platform, and when you're there on cloud, Kubernetes architecture really helps in auto-scaling and auto, you know, scaling down, depending upon how your traffic movement is, so that the costs are also



optimized and the performance is guaranteed.

Finally, talking about monetization, so all the standard ways of monetization are any OTT platform customers' expectation, whether it is subscription-based video-on-demand, or pay-view, which is AOD, which includes not just integrations with, you know, some of the ad exchanges, AdSense, AdMob, but also custom, ad, you know, VAST URLs for those, customers, those publishers, broadcasters who have their own in-house sales team. I think the next level here in this ad space is going to be a local, you know, ad engine, which I don't think anybody has been able to crack but to me, if I were to gaze a bit into the future, I think that's where the big bucks lie. Anybody who's able to crack a localized, hyperlocal ad engine for the OTT platforms will really reap the benefits. Of course, banner ads, donation and tips. This donation and tips is actually a sort of a use case for monetization that we have seen in the BTI, the spiritual and the religious, you know, OTT use segment. It works very well there, and then even shoppable videos.

Finally, talking about the fifth layer which is a new sort of an emerging area of cutting edge which is Al-based content enhancement, content enrichment. So let's say you've got your content original in Hindi language or in Bangla language, but the content has the ability to reach out to multiple, you know, audiences across the world, that's where I think AI comes in. Al-based transcription, translation, caption and subtitle generation, meta extraction and retrievability of the content at the exact same time stamp and then finally Al-based auto-dubbing which is absolutely the gold standard, you know, in terms of this, hierarchy, if you ask me. At Mogi, we do Al-based, you know, audio dubbing in all the 10 Indian languages, on the top 10 Indian languages. Unfortunately, we, I'm not connected on this laptop, you know, with the internet. Otherwise, I would have the plan was to actually show this video wherein we've done this original English language skeep changing but this is available on our website so if you'd like you can go to mogi.io.com, that's our URL.

Finally to sum up, I think these are the various layers that I've briefly talked about, which comprehensively define, you know, the scope of what you need to consider, while launching your own OTT platform, and so, I think, in the end, I would like to conclude by, talking about busting some myths which is what we've tried to do here. So, the first myth is that your OTT platform takes years to build, if you use cutting-edge technology like what we offer at Mogi IO actually it can be done within hours, that's what the team has tried to demonstrate here. So the thumbnails and the videos are something that we had extracted like I mentioned earlier but the entire process otherwise has happened on our CMS, while, you know, this presentation was going on and at the end of it, I think what we would like to do is, we would like you also to download the app. The Android APK is going to be available to you, this is the QR code and if you can use your smartphone to scan then you can actually, you know, download the app yourself and we would be happy to get your feedback. So that's all for me, ladies and gentlemen, thank you so much, have a great evening.

# Day 2

Saturday, 16<sup>th</sup> February 2024







## **SESSION-3**

## **Direct to Mobile Broadcasting**

**KEYNOTE ADDRESS** 

**Delbert Parks** President, Sinclair Technology, USA



Mr. Delbert Parks is the president of Sinclair Broadcast Group. He had held various operations and engineering positions aling with Sinclair for last 52 years. He has been supporting his company's current and future technology business strategy.

### **SESSION CHAIR**

Shashi Shekhar Vempati Former CEO, Prasar Bharati

Mr. Vempati is a renowned technocrat, columnist, policy thinker and author. Mr. Vempati has served in various leadership roles in the Indian technology, media and public policy space. He currently serves as the Chairperson of the Advisory Committee to oversee Science and Technology Communication, Govt of India. He was CEO of Prasar Bharati (2017-2022), CEO of Rajya Sabha TV(2017-2019), CEO of Niti Digital(2014-2016), Vice President of Asia Pacific Broadcast Union(2021-2022), Vice President of Indian Broadcasting and Digital Foundation(2019-2022), Member of Board of Broadcast Audience Research Council of India(2017-2022), Chairperson of External Experts Group at the University Grants Commission of India (UGC)(2023), Member of Board of the AJK Mass Communication and Media Research Center(2023-2026), Member of ICWA Council. Most recently Mr. Vempati has co-founded The 'AI for India' forum working towards the development of an Artificial Intelligence ecosystem in India.





**Professor K. Giridhar** Professor, Guide To Telecom and Wireless Sensing(TelWise) Group, IIT Madras



Mr. K. Giridhar is a Professor at the Indian Institute of Technology Madras and guides the Telecom and Wireless Sensing (TelWiSe) research group there. He studied BSc (Applied Sciences, 1985) at PSG College of Technology, Coimbatore, ME (Electrical Communications Engineering, 1989) at Indian Institute of Science, Bangalore, and received a PhD (Electrical & Computer Engineering, 1993) from University of California, Santa Barbara. Between 1989-90, Professor Giridhar was a member of research staff at CRL, Bharat Electronics, Bangalore, and between 1993-94, was a research affiliate in Electrical Engineering at Stanford University, California. Since 1994, he has been a faculty at the Department of Electrical Engineering, IIT Madras. His research interests are broadly in the areas of adaptive signal processing and wireless communications systems, with an emphasis on various transceiver algorithms and custom air-interface design for strategic communications.

> **Dr. Vinosh Babu James** Director, Technical Standards, Qualcomm International Inc



Dr. James joined Qualcomm in 2011 and has served over the years in roles spanning technology and standardization. He has responsibility for Qualcomm's standardization engagements in India, and currently leads their IMT-2030 engagement in the ITU-R WP 5D. He is an expert technologist with years of experience on product regulation. He engages Indian & regional stakeholders on matters related to radio standardization and regulation. He specializes in cellular mobile communication system design and his areas of expertise covers topics including the design and development of next-generation terrestrial & non-terrestrial broadband and broadcasting systems. Dr. James holds a Ph.D. in Electrical Engineering from the IIT Madras, with specialization in wireless communication. He is also a senior member of the IEEE.



**Prashant Maru** VP, Sales and Business Development, Saankhya Labs

Mr. Prashant Maru brings over 25 years of telecommunications experience, with a strong sales background. Currently he is the Vice President of Sales and Business Development at Saankhya Labs. He has a proven track record of exceeding top-line and bottom-line targets, including leading the conversion of a non-performing account into the region's highest performer. He played a pivotal role in securing a multi-billion dollar managed services deal with Reliance Communications and has experience in both technical and sales roles. Prior to Saankhya Labs, he has also worked for over 15 years at Ericcson.

#### Sathish Chittibabu CEO, Fanisko, USA



Sathish Chittibabu is the Co-Founder & CEO of Fanisko a digital fan engagement company – working on 5G Platforms that's revolutionizing the way brands, broadcasters & OTT, sports organizations, media companies are able to immersively engage and retain their audience and adapt to their changing needs to uncover first party data and unlock newer revenue streams. Sathish leads the overall company strategy and direction and oversees technology and product engineering. Before starting Fansiko, Sathish has led successful digital transformation and business process changes for global fortune 100 companies.



### **Mr. Delbert Parks**

President, Sinclair Technology, USA

### **KEYNOTE ADDRESS**

Good morning and thank you for inviting me. This is a great opportunity for us to share knowledge, techniques, and tactics. As Sinclair Broadcast Group, many of you may not know how we're set up and who Sinclair Broadcast Group is, so I always start out with a slide that depicts what Sinclair Broadcast Group is.

We are one of the few major broadcasters in the United States with 185 TV stations in 86 US markets or cities, covering



approximately 40% of US households with an over-the-air signal. Another interesting aspect about us broadcasters is our focus on local news. In many of those 86 cities, we have a news operation that emphasizes local news, which differs from many European broadcasters. European broadcast friends typically focus on national news, like the BBC, which doesn't prioritize local news. This is important for us as it connects us with our customers. Additionally, on the right, we are affiliated with all the major TV networks in the United States. If you look at the bottom right corner, we have linear network channels charging Comet Nest TVD, science fiction, action, and a variety of movies and TV shows. Most importantly for us and me personally is the Tennis Channel. In the United States and now across many areas globally, the Tennis Channel has a physical presence. For me, with over 50 years in this business, the challenge is to understand older technology while serving our industry as a technologist. I belong to the DPP, an organization in London, and annually we have a leaders briefing where European and North American broadcasters discuss industry priorities through surveys. What's fascinating is that what's important in India mirrors the importance in the US, Europe, and other parts of Asia like Korea. Despite thinking we're radically different, we face the same problems. My challenge is to keep our broadcast group at the cutting edge of technology with a business purpose. This is the industry's collective challenge. D2M, particularly its bottom portion, is critical to our future. It's crucial for India, the US, and Korea, as you'll see later with our relationships there. Solutions must serve the entire broadcast media business and accommodate certain differences. Many years ago, we initiated the Next Generation television process, centered around the consumer reviewer. If we can't provide content that consumers deem important, it becomes a significant business problem.

In 2013-2015, we recognized the cloud's importance in our transformation. Transformation is an ongoing process, especially as viewer habits evolve. Adapting quickly is key, as your minister noted. We actively participated in the ATSC 3.0 standard, emphasizing technology

to better serve customers. Cloud integration is crucial, and currently, we're working with Sony, utilizing camera-to-cloud technology for efficiency in our news operations. In the realm of D2M and mobile, we've long advocated for mobile video. Today, mobile is recognized as a crucial platform. Years ago, I contemplated changing our fundamental thinking in three areas: content and metadata, licensed content, and outside data sources. Digital Rights Management is vital for distributing content appropriately. The second crucial area is content ownership, including local productions, news stories, and archives spanning 70 years. Technological advancements over the years have drastically changed content creation and distribution. The third key area is the cloud, becoming pivotal in our transformation. The cloud facilitates efficient handling of content, moving away from the old paradigm where the same content was handled separately for each of the 85 television stations or markets. We've shifted our content management entirely into the cloud, ensuring quality control, checking for missing content, and managing metadata efficiently for multiple distribution outlets.

The other crucial area is TV ad optimization, audience optimization, and data audience data for commercial broadcasters. D2M allows us, for the first time, to have a relationship with our customers on connected TVs or devices. In the past, we relied on third parties like Nielsen or Comscore for data guidance, but now we can establish a direct connection. In what I refer to as a three-legged stool, the third component is the distribution matrix. Shifting from being a linear TV broadcaster, we now need to reach our customers on every mode and device efficiently. Content creation, curation, and distribution across various devices, particularly mobile phones and tablets, are crucial for our business. Our cloud transformation is a significant ongoing effort, with a focus on centralized playout monitoring. We've chosen an Indian company for a commercial arrangement, emphasizing the importance of AI in moving our playout to the cloud. Capital and operational savings are vital, and we've invested time in presenting these numbers to our CFO. Advertising technology is another key focus, as we now have the capability to sell across all platforms. Unlike the fragmented systems in the United States, we're working on developing an integrated system for selling ads that spans our digital and linear inventories. Moving on to our Direct-to-Mobile (DDM) and Broadspan business use case, we're exploring opportunities in automotive and content distribution networks. Autonomous vehicles present a growing need for data delivery, and we're actively engaging with automotive OEMs. Additionally, the challenge of delivering large-scale content, such as 4K video, requires collaboration with global content distribution networks. Broadspan Wireless, our broadband wireless platform, is a collaborative effort with partners like South Korea Telecom and Sanjay Lees. Enhanced GPS for autonomous vehicles and alternative GPS signal generation in case of satellite issues are also on our agenda. In terms of international collaboration, we have partnerships with Korean broadcasters and consider India a significant player in the D2M space. Our joint venture with South Korea Telecom, Cast. era, aims to merge traditional broadcast technology with telecom services. This aligns with our belief in the importance of 'Make in India,' where we have a permanent presence



and a strong partnership. For those unfamiliar with D2M, it is a critical technology for our media industry, not just television broadcasting. We're actively deploying this technology in Korea, India, and the United States, anticipating that India will lead in the D2M space. On a global scale, other countries, such as Mexico and Canada, are exploring experimental transmissions, while Brazil is close to choosing ATSC 3.0. This international adoption is crucial as it allows flexibility and growth, breaking the cycle of discarding equipment with each technology upgrade.

In conclusion, our industry's connection to local communities remains paramount. Local broadcasters, particularly in the U.S., are still viewed as having the highest credibility in the media. We emphasize our role as the "camera to cloud," and our participation in initiatives like C2PAA underscores our commitment to maintaining the authenticity and credibility of our content in the age of AI and deep fakes. Throughout my career, we've leveraged new technology for business transformation, and the adoption of D2M and ATSC 3.0 continues this tradition. Thank you for having me.

## Session on Direct to Mobile Broadcasting

### SESSION CHAIR

**Mr. Shashi Shekhar Vempati:** Good morning. Good to be here at the BES Expo again after several years of becoming part of this community. Coming from the IT world, broadcasting was a big shift for me personally, but I think I've learned the jargon and the terms to be able to follow most of the conversation. So, so good to be connected. The session today takes off from the keynote that Mr. Delbert just presented on D2M and how do we see this space evolving? He gave a very interesting perspective from the traditional broadcasting world standpoint with ATSC. I'm sure we'll have a different perspective to hear as well from the stage.

As you know, India is consuming video almost at the rate of 20 gigabits a month. So clearly, we are one of the world leaders in terms of mobile video consumption, and all of that is happening over the traditional telecom networks. The question is, can we evolve this architecture to be able to broadcast directly to mobile phones? And then, what is the best way to do it? I think that is really the topic of debate. So we have a very interesting panel here of both industry practitioners as well as from the academia.

**Prof. K Giridhar:** Good morning, everyone. It's a joy and privilege to be here. I sincerely thank Sashi for giving me this opportunity. I have been looking at the sub 1 GHz Spectrum for nearly about 10 years now, and the reason is 3GPP and the West have been looking at the midband 3.3. Of course, they went to 27, and now they're coming back to 10 GHz or 11 GHz. I always felt that we should play to our strength, where we have had 2G networks for a long time. There have been equipment vendors in the 700 Mega space for more than



15-20 years in the country.

If India has to make a mark in Telecom, that's where I started. I've been doing Wireless signal processing for now 30 years. I thought we should look at where there is an environment of excellence in India already available and tap into it rather than run after what the West is doing for its benefit. Are there good uses of the Spectrum in the lower F bands? Specifically, I was looking at 526 to 700 MHz or 703 MHz, and based on that, we have done some work in my department in my campus. We have done some proof of concept hardware implementation, and I quickly realized that this band can be used for India's future.

There's so much in this, maybe to 250 MHz if you do this carefully, wisely, sincerely, with all honesty and quietly, we can have a huge impact on first of all our own country. We can make a big difference. So I'm just trying to share some aspects of that. I remember when Mr. Sashi contacted me a few years back, that's when I realized that Prasar Bharati has been very conscious of trying to utilize this band carefully for National interest. Public broadcasting is definitely one of that, and if it can be integrated along with other services, perhaps that's a way to utilize this band more carefully.

Our country comes with the culture of waste not, want not. So I believe this band is prime for that kind of activity. We shouldn't just give it away to 3GPP or give it away to some other use case driven by a narrow agenda. I think there's so much to be done in this band, and I'm just trying to share some perspective. So my talk is titled thoughtful utilization of this band by homegrown Technologies. Now I'm not saying cutting-edge Technologies; let it first be homegrown. We'll understand where will be the falls, but we need to grow it, deploy it, try it out for some time, then we can really Master it.

And what we see today and what Mr. Dilbert Parks was speaking just 5 minutes back was one of the current needs for the country is direct to mobile, but we want to also look at Future needs. So this band I think is pivotal for that. What are the pros and cons of this band? I think many of us here in the audience would recognize this. The band gives you excellent coverage, excellent penetration indoors, as well as excellent penetration under the foliage. This can be used for various security purposes as well.

The other aspect is this, as I said, the design of many of the subsystems, some of the costly subsystems are power amplifiers, antenna subsystems. Now the base band itself is not that expensive if you think about it, right? And Spectrum is extremely expensive; we know that. But we have understood the technology and the tower business and a lot of the outdoor installation business even in remote areas in this band very well. We have to use that to our advantage.

The cons are the available Spectrum is extremely expensive. There's so much pressure to keep reducing the cost, right, and try to reduce the reserve price, as you know, from 13,000 crores per megahertz to less than 6,000 crores per MHz, and there's a pressure to decrease it further. The second thing, which many of you might have heard this word



multi-input multi-output. The word MIMO comes from control theory, but the wireless people have made it their word, okay, the so-called MIMO technology where we show a lot of multiplexing gains does not really work in this band.

So if you have to really use this band wisely, you should know your fundamental wireless communication, your fundamental signal processing, which goes at various levels in the chain. You should understand this very well. Why should that be more important with MIMO? You can do multiple things; one of them is also removing interference. But since you don't have MIMO now, you have to manage the heavy cross-talk or interference band in a pragmatic manner, and that's where the challenge is.

Just take a simple example. On the left side, you see LTE deployed at 3.3 GHz. Let's say with some 8 or 10 Towers, you get coverage like this, what I'm showing you on the screen on the left. You can see that these coverage patterns are non-overlapping. Now, when in India, the BSNL towers are deployed all over the country, 8 lakh towers are going to be added, and so on and so forth, and we'll be reaching all the 6 and a half lakh Villages very soon with 4G. It'll be this kind of coverage, but you can see there'll be gaps. Some Farms won't be covered; some Orchards won't be covered.

What we are saying is if you take the same technology, has directly put it in 500 MHz LTE or even 5G NR, it will give you lots of overlap because of the fact that the propagation is much better at 500 MHz compared to 3.3 GHz. But then you are having here a lot of interference, and if the technology cannot handle interference, again, you don't get any coverage. So coverage simply does not mean having the signal being present. It is the ability to handle interference very well, is also equally important in this band. The interference is a major player, not noise or lack of signal.

So how do you work with interference carefully? This is the game, and you have to do this without getting help from multiple antennas. So you have to do it only with your waveforms and with careful signal processing. That is a challenge we took up, and we believe there are excellent solutions for this. Homegrown Solutions. What are these Solutions trying to address? There are three main things we went after. Can, with the same Spectrum, I just give you an example. Let's say 526 to 703 because right now, even in the latest announcement, what the government has said, the 600 MHz band is not going to be put on the auction block for multiple reasons, and so this is a good band to innovate along with the TV White Space Band, which Prasar Bharati has been using.

Can the same Spectrum be used for purely and truly integrated broadcasting and unicasting? One example is you see the D2 is a precursor to this D2M done under with ATC 3.0. But moving forward, we want many more things to be done. If you see fundamentally today, if you see the technology which is driving D2M is based on what is called as a single frequency Network. So there are multiple Towers which generate waveforms in the same frequency, and they get added up. And that is very magical because this addition, if you some of you know Max right, this actually a phaser addition. It's adding complex numbers. So you don't even know that they're adding properly, but statistically it turns



out they are adding in a way which is good for you.

But starting with those ideas, we can now do multiple things where we make signals much more reliable. Single frequency network is one way of doing it, but you can also go to what protocol, as you know if you really want PPDR messages, public protection, and disaster relief messages to reach a customer. There are other ways to make signals reach them with excellent reliability. This can also be done. So integrated broadcasting and unicasting is the future. Let us; there's no two questions about it.

The second application, while we do this excellent band, why carve it out for each operator having a small Pi of 30-40 MHz? Why cannot every operator enjoy the full 171 MHz between 526 to 703, for example? Right now, suddenly you're looking at Broadband wireless access in sub one GHz. True Broadband. See today, what is really 5G NR doing which is different from LTE from 20 MHz channelization? You're going to 100 MHz channelization, and we all know from 50 for 50 years, the moment your bandwidth increases, your capacity increases linearly with bandwidth. That's all has happened.

Then you put in lots of other Masala around it, make it think that 5G NR is really something revolutionary. It is not. It is a small Evolution from 4G. It's really revolutionary if you ask from CDMA when we 3G when we went to 4G; it's a very new waveform and a wonderful waveform on inside. Now the point is, instead of carving out the Spectrum, if I give a full band of the entire 80 MHz, second 80 plus 80, I'm going to show you a quick figure. That means whatever the operator can enjoy at let's say 3.3 GHz or tomorrow at some around 6 GHz, he can enjoy in the sub one GHz band. That is something quite remarkable.

And since he's sharing the Spectrum with three other operators, the cost per operator should only be 1/4, both the licensing charges as well as Spectrum usage charges have to become only 25%. But then every operator is going to use the same Spectrum in every cell, every sector, every Telecom Circle. How do you manage that? Can it be done? Yes, it can be done. We have the technology for it. We have filed the patents. We need the government to make bold steps to allow this kind of ideas to really be deployed. But in parallel, we have been observing for the last we started doing this some four five years back, but now you can see a lot of 6G talking about this, the notion of sensing.

What is sensing essentially means using radar principles to figure out different objects at various locations. When you do sensing of terrestrial objects, the problem is very different from trying to sense, for example, drones or UAVs which are flying in the sky. These two problems are very different. We believe this particular band has lots to offer in both these cases. And we are not just talking about UAVs and flying at 100 m, 200 m, or 500 m height. We should be able to sense the LEOs and MEOs which are going over our skies starting at 300 km. Today we don't even have the ability to find out which LEO is where unless they're putting it in their online; they're declaring this is my trajectory, this is my location.

As a country, we don't have a way to independently verify which satellite is going



over which part of our airspace, right? There is much to be done. And all this should be distributed when I say distributed; we are not looking at a few radar stations. Just imagine, can the entire country be seen like a big radar array, and we can spot all flying objects in the sky using this particular band? We believe it is possible. But not only, as I said, objects in the sky, you can use it for ground telematics. Several applications which are strategic, including Precision farming, Precision agriculture. The scope is enormous. Economic activity can happen. So the answer is the same band can be used for all the three major areas.

So this is just a straw man I'm putting down. I know whether the government does this or not. I don't know, but we have a solution which is conceived, designed in India where up for mobile operators and Prasar Bharati in a 80 M 80 MHz can be using this along with ubiquitous at least 3 million square kmers of India. We should know every flying object in the sky. Our country is about 3.4 million square kilometers, right? We believe this band is very useful for that. Traditionally when you do FDD and why did I propose FDD here instead of TDD, which is a flavor of the day in India? With FDD, you don't see this what is called as a ducting problem.

Right, you talk to Parag; you talk to people in Telecom; they'll say that TD systems have something called the ducting problem. IFD doesn't have it. And the guard band you give up usually in FDD systems today in 900 MHz; we don't use several megahertz because of the guard band we need. In FDD, we can give it off for other kinds of Wireless sensing. We really can utilize every megahertz here wisely as a country. And then the world will hopefully also benefit. So to summarize, I think indigenous ways of looking at this band is high time we take. We quietly do this. I don't want to say we take leadership, etc.; we will. What we are capable of doing in this country. And I believe we are only scratching the surface, what we really capable of.

And whatever solution we bring can and should exploit NavIC, the Doordarshan towers, BSNL Towers, the LEO and MEO satellites put out by Indian operators. And in my view, after studying this for some time, the first steps taken by this Indian company along with companies like Sylar helping them to take it outside India. This direct to mobile solution using ATSC 3.0 as a vehicle to augment what to actually even help the cellular operators tomorrow offload traffic is an excellent first step because they have taken a waveform which is available and used it in a different way to give a solution which is currently very useful.

And as we gain confidence and insight, we will do our own waveforms; we'll do our own algorithms system design and applications driven by India and other countries. And we will fulfill them, and I think we are just taking the first few steps. There's much to be done, and we are ready for it. Thank you.

**Mr. Sathish Chittibabu:** I'm very grateful to be here. You and I, it's interesting that I did my bachelor and Masters in communication engineering but never got a chance


to work in the field directly. So coming to a conference like this where you meet a lot of engineers in communication engineering is a dream come true for me. And again, I thank this opportunity to present an interesting use case of business application. Right, and we are, to just give a little background, Fanisco is a sports tech company. We focus on digital fan engagement. We help broadcasters from a second screen engagement standpoint. We help sports organizations to reach their digital audience, qualify digital audience, understand who they are. We help sports media companies, gaming companies, and all to engage the next generation of fans.

So this topic, right? I think when we are trying to, can I do it? Even yesterday when we were talking about D2M and other things, right? One of the things that we constantly see in the market evolving is the next generation of fans consume content very differently from how the previous generations have consumed, starting with the new print media to radio to television and mobile. Right, in fact, I was listening to a podcast and one of the predictions for 2024 is that TikTok, right? I know it's banned in India, but TikTok is going to be the number one, you know, streaming platform in the world. Right, you know, we have Netflix, Amazon Prime, and all those things going along, but TikTok, of all reasons, right? The reason for that is the next generation of fans don't want to choose things, right?

They want content to keep flowing. They want content to be personalized to them. They want engaging content, right? We sometimes assume that live streaming content is going to engage the audience, but interestingly, people are not interested in just watching for three hours or ten hours of live content. They are more interested in getting short-form content and other things. So that's why, I mean, like, I'm going to talk about how to engage fans. I mean, since being a sports tech company, I want to present that use case beyond the traditional broadcasting, right? Be it linear or mobile or whatever it is.

So, I mean, as we know, right, mobile is disrupting the landscape of content consumption. Almost 90% of the internet traffic, if you really look at it, right, it's mobile video. You know, any form of video, right, be it on social media, be it on any other sharing video and other things, but 90% of the mobile traffic, internet traffic, is video. And 60, you know, almost 68% of the consumers choose mobile for their content fix, right? So, I mean, of course, we get down in the night and watch, turn on television and watch Netflix and other things, but during the day, the amount of content that's consumed is through mobile, you know, and people rely on mobile for all the content that they want to get. And the challenges that OTT faces, right? There's always going to be, I mean, with the new, as Professor was saying, right? 5G is a glorified 4G, right? So, eventually, you're going to face a problem because majority of the data is right now consumed over the internet, right? So, you're going to have bottlenecks as more and more people adopt video and, you know, streaming and other things, right? They want to consume.

We're going to start seeing bottlenecks in, in on the OTT side. And also, you know, like I was, I think someone was talking about how, you know, even though, you know, the



majority of the content is consumed on mobile, but still, we are spending a lot of time on creating 4K and 8K content when really doesn't make such a big impact when you see on a small screen, right? And also, the content has to be a little engaging and different than the traditional way of streaming content. And also, one of the important things is how do you rethink, I mean, how do you shape engagement, different engagement strategies to attract the younger audience? I mean, my son is a 12-year-old. He loves sports, you know? Of course, his mom prevents him from watching, you know, the continuous amount of sports, but he catches his daily dose of sports news from a YouTube influencer, you know? He watches that YouTube influencer for, you know, 15 minutes and gets a whole thing. And I tell him that, you know, he has to read news sports news, as we all learned, you know? He has to follow the traditional media to consume sports news, right? But he gets more information than me from watching the influencer. So, the way the younger audience looks at and consumes content is very different from the way other, you know, the older generation has consumed content.

So, a couple of things on the broadcasting side, I'm just calling it as missed opportunities, right? Is, I mean, traditionally, if you see broadcasting is one-dimensional, you know? I watch it on TV. There's no way I can interact with the broadcaster or, you know, like I cannot participate as a viewer, right? I mean, there's always this lack of first-party data collection, right? Unless you collect data, right? Unless you understand what somebody's watching, somebody's engaging the behavior, there's no personalization is not possible. And I mean, that's why the big social media giants are making it big because they are able to offer that personalization in the user-generated content because like what I see on my content feed is very different from what others see, right? The third is there's no, I mean, like, you know, I guess our only day cricket matches go for the whole day, test matches go for five days, any sport you take, right?

I think this is becoming a bigger problem that the attention span of the younger generation is very small. So it's very hard to keep them engaged for longer durations of time, be it in any sports, right? That's a big risk. Sports as an industry is looking at how do I engage, how do I innovate to make sure that we can keep the younger generation attracted to sports. I mean, there's a very interesting stat in the US that, you know, the average age of a sports fan is 50 plus, you know? Like, if you take the bigger sports, it's 50 plus because where are we losing the younger generation, right?

The younger generation are going to probably esports where they are playing a role, they're doing a role play in the games and, you know, the younger generation are, are we losing them to Snapchats and Instagrams and, you know, TikToks because they love those contents. So why does user engagement matters, obviously, right? There's a significant increase if you're able to understand who your users are and engage them and personalize the content for them. So retaining them in and bringing them into the ecosystem helps with monetization opportunities, right?

And definitely, it's going to be a significant impact when you measure how you can



personalize what you want to push to them, right? From messaging, from, you know, upsell opportunities and other things, right? That's only possible if you're able to retain them, engage them, and keep them in their ecosystem, right? So, yeah, I mean, I'm talking about engagement, right? What does it matter? What does, what does it mean, right? To put it in simple terms, right? Today's users love doing some really simple stuff, right? People sitting on the train, going for a ride, yeah, they may be watching a video and all, right? Now, with mobile, you can actually minimize the video, right? My wife always does this. She watches all her TV episodes and other things on the phone. She minimizes the video screen, but plays Candy Crush or another game. So, people are engaging in casual games to play because they're getting bored with even with the regular content that they like, right? And another element from an engagement standpoint is people, you know, I may be a fan who's watching. I may not be able to go to the game, go to the match, right?

To go to the stadium. I may be far away. How do I get into it, right? How do I get closer to the action? So, augmented reality and virtual reality technologies are, you know, like I've been there for a while in the last few years, and we are starting to see those immersive experiences taking the user closer to the action, right? And, you know, how do I personalize the commerce, right? You just cannot present the same, a good example I can give is, let's say that I'm a die-hard fan. I keep following the sports scene, you know, news and, you know, the team and other things.

I watch all the broadcast. I may be getting a 50% discount, whereas somebody else may get a 10% discount on the same merchandise or tickets to an upcoming game or other things. So, you can personalize some of this if you're able to engage them and collect the first-party data. And, of course, the personalized OTT, right? I mean, today, every sports has multiple cameras, but unfortunately, the broadcast only shows you one view of the camera, right? And I have a funny example I'll show in this slide. But fans want to control what they want to watch.

They are no longer satisfied with the same thing that everybody watches. So, adding, I mean, today we assume that everybody, if I turn on the TV, if I broadcast, everybody will watch, right? But in reality, everybody's looking for, "What do I get by watching? What do I get by giving my time for the broadcast?" Right? So, integrating loyalty programs, gratification, and bringing in the competitive nature in the by doing games and leaderboard and prizes. So, this kind of builds an ecosystem.

This kind of helps you to retain your fans, increase your reach, bring more fans into the whole ecosystem of engagement. And we, as a fan engagement company, we focus on these innovations, and we continue to innovate and present, and, you know, we have a platform, and we offer solutions, and we have seen significant impact with our clients, you know, the conversions, the call to actions, and other things. So, I'll run you through some examples just to kind of, you know, show you how it looks.

A simple gamification, like a trivia or polls to capture their opinion and other things when they are watching, right? Like, for example, it can come on as an overlay on the screen in



the broadcast, or, you know, separately, they can go and participate in, you know, you're able to get them. You're able to get the touchpoint with them. And simple casual games, right? You know, very interesting games like these are very simple sports-related games that we build, or we partner with other developers to integrate these. Increase the time somebody spends on your platform. Netflix, for example, has a good, you know, Netflix as a streaming platform. I don't know how many of you have played some of the games Netflix offers. They have seen a significant increase in F coming back because how many times you'll be picking and choosing what you want to watch, right? Sometimes you end up playing games too. More live sports, right? I think with, I was reading an article today that in the U.S., they are betting, I mean, they're betting that in-game betting is going to be the next big thing in sports, right? So, historically, you, of course, betting is not legal in India, so predicting what the outcomes during the game, right? When somebody's watching live broadcast, making them predict, "Hey, what's going to happen? Is A.T. going to hit 50 when he's on 45?" And you get to answer within the next two minutes, right? And then you go on a leaderboard, right? So, fans love that competition, you know? That's what they are, you know?

The next generation of fans are trained or, you know, the other ecosystems are providing that capabilities. So, fans love these types of gamification, getting in, getting, they're basically playing a role in the sports rather than just sitting and watching the streams. So, we did this for ICC World Cup last year, where the wagon wheel and the pitch maps and all the other stats that you see on your TV broadcast, right? They just show up when the commentator wants it and just disappears, right? So, we were able to project it through AR on a tabletop. So, as a fan, I can interact with it. I can go in and check any time, you know, what the stats are and all, right? So, this is a good example of how even the stats, right? Can be used to immersively engage the fans. And we did it for the World Cup last year. And, you know, without no marketing, you know, ICC was, they were able to get 100,000 more users interacting with these experiences.

There's another interesting use case we did last year IPL, where we did a selfie with the players. So, where you can bring in the players walking into your living room and take a record a video. And this was a huge impact for Geo. We did it for Geo from a brand engagement standpoint within the Geo Cinema ecosystem. And it was able to touch more than 2.5 million users who actually participated and who took a video or a picture and shared it on social media and all.

And Geo, interestingly, used it from a conversion standpoint that you have to have a Geo number in order to kind of download or share. And they were able to increase the Geo subscribers to 47,000, right? So kind of like, you know, these are some examples of business applications of how you can actually leverage a second screen experience to attract fans and stay within the ecosystem. And, you know, like these examples show you how you can actually take fans closer to the action, right? So here, dodges. I have a walkthrough of a dodger stadium in augmented reality.



You can open it in your living room and make the fan walk through and, you know, enjoy because majority of the fan don't even go to, I mean, 92% of the fans don't even go to a stadium to watch, you know, they're all watching it remote. So getting them closer to the action is a very engaging way to kind of, you know, offer a part of your second screen. And the other one is kind of like, you know, walking through a locker room, right? How many fans get a chance to walk through a locker room, right?

Even in a physical, even if they go to the stadium, they never get a chance. So these are interesting content that you can use to present it to your fan base. And again, using AR, right? I think you can bring in some gamification element as well. For example, on the left screen, you're playing an AR game in your real world, right? So it's not a 2D 3D game like on your on just your phone, but you are able to kind of project it in your real world and, you know, play with it, right?

And all these immersive experiences that we have seen when we measure it, we are able to see that fans spend more time. And that's a great opportunity for sponsor activation or anything like that that you can integrate into it. And that's a good revenue channel, right? If you are a broadcaster or if you are a streaming OT platform, you know, adding these elements offers an extra way of generating more revenue from sponsor activations, you know? And another interesting concept has evolved is that we've been asked for realtime engagement. When you say real-time engagement, yes, I'm watching the stream.

How do you bring the community to participate, right? So if I'm watching, you know, I can bring in my friends, have a watch party, you know, chat while I'm watching, right? So these are all adding extra elements beyond just the broadcast, right? This helps in making the fans keep coming back and watching the stream. So, you know, here in this example, they can chat and they can actually, you know, have the video and while the stream is playing. This is another nice concept where you can integrate merchandise.

So here's a concept where we were actually pitching to Rakuten, where you are able to, I mean, if there's a jersey launch or something, fans can actually check on it and do a AR try-on in augmented reality, right? And immediately, you have a call to action to buy it, right? So it's a new player sign up and, you know, this whole, you're able to kind of make it all in one transaction, right? Otherwise, this would be like, you watch the stream in one platform and you have to go and search for where the jersey is available and you won't even be able to try it on.

You have to just go to an e-commerce channel to buy it, right? So you're like, you're trying to, you're trying to kind of like, you know, send the user to multiple channels and definitely there's going to be drop-offs, right? So integrating everything in one place is a good way for increasing the conversions. Another one is a personalized OTT. I already touched upon that, right? You have so many camera angles, right? If you're able to afford and present the different angles in the stream, let the fans pick what they want to watch, right?



Rather than just forcing, okay, hey, this is the one stream that you have to watch, right? So let fans be their own video producers and pick and choose what they want to watch, right? So in, in related to that, I want to present this wrap up with this funny case study that some of the U.S. folks know. So Otani is the highest paid athlete in the whole world. He was with the Los Angeles Angels and now he signed up with the Los Angeles Dodgers for \$700 million and he's a Japanese born baseball player, like a rare one of the best players in the history of baseball.

The Japanese fans would love to sit and watch him, you know, pick his nose, scratch his head. He doesn't even have to play. So the broadcasters created a separate stream of So Otani and, you know, for the Japanese fans, right? So even when he's not playing, there will be a separate stream of him that fans can watch and fans just love it and, you know, the revenue generated from that broadcast and from that the viewership increase has been significant. So in a nutshell, as I wrap up my whole point is right, as we talk about streaming sports is one of the biggest, you know, live streaming component. We have to understand what fans want. We have to engage the fans. Next generation of fans, their way of consuming content is very different. So we would like to, I know that's kind of the whole message about how you can use fan engagement in a different way and connect different fans. Thank you.

**Mr. Vinosh James:** Thank you and good morning. So last year, I was on the same stage. Sashi asked me a very pointed question I didn't anticipate for, so he was asking me, you know, I would like to hear what Kcom is doing in this space, right? So it took me one year to answer those questions. So I have the answers, and I'm going to give some answers, right? So I'm going to talk about, you know, how to achieve true convergence between the broadcast and broadband part, right? But then, I'm speaking in a D2M forum, right? So probably I should also sell something about D2M, right? And that's one of the most abused terms I have actually come across. I'll tell you why, right? So when we did D2H, Direct to Home, it was like a clear societal ask that, you know, we are in an analog world, you know, we are doing something else.

Home is not where entertainment is coming, so we should get entertainment in here, right? So there was like a clear societal purpose which D2H was serving. But when we talk about, you know, D2M, is it talking about Direct to Masses or is it actually talking about Direct to My Monitor or is it to my motor car? It's not clear, right? So if you look into this particular screen, what I have in here, these are all use cases for what you could potentially call as a mobile because these are all mobile platforms, right?

You call it a mobile, your handset, that's the same thing which mimics your laptop, tablet, and to some extent a laptop, and same in, you know, infotainment in the car, you know, gens of stuff. So if you're not addressing these use cases, then D2M is Direct to Mocha, dead on arrival, right? So if we are planning for something which is called D2M, then we



need to ensure that, you know, it should also lead to direct monetization; otherwise, it's just going to serve self-interest, and then, you know, we are not going to get anywhere, right? So, okay, great philosophical thought, V, come to the point, you know, what is it that you want to convey, right? So you are saying something, S, me, so we wanted to enable this and how did you want to enable this, you know? I told societal call, there should be like a societal purpose. So we heard a clarion call last 2022 from Prime Minister Modi who told that, you know, "Hey, I'm launching 5G.

I want this to reach all the 130 million people in the country, and then, you know, I want you guys to rally behind and ensure that, you know, it goes to each home. It becomes affordable, and then it serves multiple industries." So that was our clarion call. What we did was we picked up that and then tried to ensure that, you know, you try to see how to leverage this technology which a prime minister is asking to get commoditized and then see how it actually gets into addressing this new opportunity because for us, broadcast is just a vertical which the mobile industry will anyway serve. Right, so moving into that, you know, you need friends, you need partners because you can't do it right. Again, just, I need to tell about Qualcomm also, right? So we are like a technology company.

We develop technology and then try to ensure that it gets adopted. We don't make products. We only have one solution which is a platform called Snapdragon. It's a technology platform which goes and enables industries, right? That enables is the key. So in this particular case, we try to figure out, you know, how to actually enable this broadcast industry, right? And then, if you want to get into something called this mobile, right? I think, let me call it direct to modem for the time being, right? Because it's a modem which is everywhere, right? So I want to basically ensure that, you know, you have your sole signal coming, you have your broadcast signal coming, right? It can be like same infrastructures, different infr, doesn't matter. But the moment it comes into a mobile, it needs to come into a converged model. A converged platform, that's our philosophy, right? And once you have this, of course, it's an F band, all those things, you know, there is some effort needed to it.

But the moment you have it, the moment the problem statement, which is the last bottom, how do you increase broadcasters' viewership by enabling the most efficient delivery of mass data and live media content? If you can solve that, you have a business, and our mantra is very clear, consumer is king. If it is not appealing to the consumer, you're not even getting started. I think Dell Park made a right statement, right? Technology, if it is not adopted, is just technology, zero value, zero utility value. And Qualcomm is not in that space. Our thing is, if consumer adopts, there is opportunity.

Most importantly, solution provider should make money; otherwise, he's not going to invest in rolling out the technology. These are two things are key, right? And then, we



actually work with ecosystem players, right? So, for example, we have a lot of people who enable, but a lot of them are frenemies, friends and enemies, right? So, they don't give us permission to put their name in here, but whoever gave names, we had actually listed on here. These are our startup partners, close to about 60, 70 who agreed to have their names listed. So, we work with them in enabling these ecosystems. And then, one more page worth of it, tons of them in the semiconductor space, tons of them in the infrastructure space. So, all of them working stealth mode, trying to enable the ecosystem both for India and elsewhere, right? So, why am I saying this?

I'm saying this because the 5G broadcast proposal which you are proposing, it's a Make in India story. It's about our startups, it's about our ecosystem. But startups can be big and small, right? So, let's see a very good example on, you know, where we are and how we can actually enable this ecosystem right. Because finally, if I'm not enabling an ecosystem, it's Direct to Mocha, dead on arrival, right? I don't want to be in that space. I want to be in a space where somebody can actually make a service out of it. Just an example, right? What I'm pointing in here is like four base stations, traditional base stations.

It can be BSNL, Geo, Airtel, take whatever it is, you know, it's doing it. But you would have actually heard about this particular thing called Airstream fiber, right? It's basically trying to cut fiber and then it's actually using air interface to get the signal in here. Who is doing it? It's the same technology, right? Even Tatas are trying to roll out the same thing for BSNL. It's based on the same 3GPP set of technologies. It's actually coming in. What does it do? It is actually facing the base station, getting the signals, and then converting it into Wi-Fi inside my home. Okay, we know this is a broadband use case.

Why are you telling it in here? Come to the pitch, right? I need to hear about why it is about broadcast and how are you enabling D2M, right? So, if you investigate this particular box which is called the Airstream fiber box, it's actually made by a small company called HFCL in India. I hope many of you know about it, right? They are the ones who are actually manufacturing and exporting. Right? I told you it's a Make in India story, right? It's a Make in India story about HFCL. They make these boxes, and the plan is they will make 200 million such boxes for Indian and outside operators. India's just according to 200 million plus, which means they are going to commoditize it. So, we investigated that and then we figured out that, you know, it's actually a Snapdragon SDX75 platform which is in there, and that particular guy is capable of doing this 5G broadcast, and it also has F-band capability, okay? So, what we did was we leveraged that platform.

We added broadcast capability to it through 5G broadcast, and then, Voila, this is what happened. Suddenly, I have like smart devices in my home. My laptops, tablets, PCs, all those things all get connected. I'm not targeting about one mobile device. I have connected a home, right? So, assuming that, you know, each home has like, you know, 10



devices or whatever in it, 200 million devices, just do the math.

Those many devices are enabled by a technology which a prime minister on a clarion call asked to commoditize and then address a market. That's where we are. We try to ensure that, you know, we see the holistic picture, not trying to say that, you know, plug and play something, you know? No, you need to look into it holistically. Why do I mean by that, to look into it holistically? Now, if these operators commoditize it, assuming that, you know, they succeed, I mean, it's a math, business math. I agree, hopefully they did the math properly. And if they did the math properly and then 200 million devices are sold, then it's becoming a commodity. Now, the government can procure that, put it in schools, and do the same thing. Your education platform suddenly gets on board. You receive broadcast content, education content through the same platform, and those tablets, it's all on Wi-Fi. It's all commodity. You're not bringing in any new device into the ecosystem. It's what is existing today. You basically take it forward.

That is what will enable the ecosystem, and that is what we are trying to do with all those startups and others, including HFCL we spoke about, right? But then again, V, this is about indoors. Where is mobility? What are you doing for that? Because without mobility, you know, right? Because India, we want mobility. Just a side note in here. So this demo is there in C4, so I request that you come experience what I'm saying is actually a fact. And then, you know, do it. So going to the next use case, right? So it's a loaded slide, right? So I'll be a little careful. It's not a making India story for India story. No. If HF is manufacturing, he has to go and sell it elsewhere; otherwise, there is no point in doing making India. It's not make for India; it is make in India and export to the world, right? So what's naturally happening is there is also interest happening in 5G broadcast throughout the world. And then, I think as Professor Gir also pointed out, 470 all the way up to 692 is the broadcast band.

The original broadcast band Europe still retains the whole B, but India, you know, it's actually a smaller space. So what we figured out was what is IMT band in China, which is called N71 band, is the same broadcast band in Europe. So we picked up two devices. What you see as commercial-grade devices listed in here, those are like the real OnePlus devices and realme devices in the market in China. Right, in that particular band, it's doing uplink and downlink. But we reworked that and then we are using it for the demos in Europe. And then for India, we are in the lower part of the band, right?

There's a small challenge in there. What is that challenge? We have to operate in 550-something odd bands, which is a little tricky, right? Why it is tricky? Because if I have to design an antenna for that, Professor Gir will tell you that, you know, it needs to be at least Lambda by 4, which means, you know, it needs to be about 5.5, 6. My phone is 4. In where do I put a 6 in phone antenna? Something need to be done to it, right? So



that's the challenge. But again, Ccom, technology company, we solved it.

My folks in Hyderabad, they actually solved the problem and then ensure that, you know, you are able to use leverage the existing antenna space in the phones and then do it. Why am I emphasizing this? 30 seconds. I bring in the Indigenous story. It's our Engineers based out of here in Hyderabad who actually solved this thing, okay? So the, it's very clear. Again, the same demo. Go to C4. You'll be able to witness, and I encourage that, you know, all of you actually come. Right? But then let me go a little fast. So we have to finally do a large-scale trial because without a trial, there's no purpose. So we applied to Prasar Bharati, and again, I told you we are all Frenemies in here, meaning the ecosystem players we are working with, there are friends, enemies, all those stuff. So they didn't want to come forward and do it. They told, "Hey, colcom, can you go apply? We will rally behind you." So we applied. We applied to TUMI in December, sorry, into the MI in December, and then again to Prasar Bharati in January. So the moment we get the permission, we would want to do the trials. We want to do trial in Delhi. We want to do the trials in Mumbai, right? And just to show that, you know, we have done the math to it, we also did the network planning tool optimization stuff. We figured out that in Mumbai, if you can just radiate the existing Prasar Bharati installations, you don't need anything else. Just those two towers, if you see in the bottom right, there are two towers put in there.

If those things are eliminated, Mumbai is covered. Delhi, a little complicated because, you know, it's an amoeba-shaped city, right? So you need three of those existing towers and then probably seven more. That's it. So if there is this interest, really commitment from Prasar Bharati to do it, you can actually go ahead and then trial it now, and then we can actually demonstrate that, right? Again, in the interest of transparency, I'll be very clear, Qualcomm, it's a global company. So it's the same story we will tell anywhere we go.

It's the same story we'll tell in Europe. It will be the same story we tell in Taiwan, anywhere. It's a question about who blinks first. If Prasar Bharati can enable it, HFCL or somebody associated, those hidden names, they win. If you don't, Pegatron wins, right? I have a few more slides. Yeah, this is important, right? So India, it's a DVB country. So what do I do with my DVB assets? Have I... do I need to exit? Do I need to junk it? Answer is no. If you have 5G broadcast, it's just a bit pipe on top of that.

Everything you run is actually a service. So Satish, whatever he mentioned, whatever his industry or his company enables, it's actually a service. It actually runs on top of it. That's the beauty about this technology. Somebody else bring in a DRM, yes, run it. It's a service. The same way DVB, it's a service. It brings in codex, packaging, service announcement, discovery, all of these things. 5G broadcast allows DVB service to be run on top of it, and same can be leveraged both for 5G unicast and broadcast. So everything is in there,



right? And the moment, you know, we get this trial available, we are in business, right?

So the summary slide, 5G broadcast technology is proven. Whole idea was about hardware reuse of the cellular modem so that, you know, the adoption becomes easier, rolling down. Qualcomm is innovating in the space. We are working with Indian ecosystem players and enabling the true direct to mobile. And we sincerely look forward to the permission coming from Prasar Bharati because the moment that comes, you will witness set in large scale trials in Mumbai and Delhi. Right? With that, I thank you again.

**Mr. Prashant Maru:** Thank you, thank you, Shashi sir, and BES and everybody here for giving me this opportunity to present what we've been doing, what S has been doing along with Prasar Bharati, MIB, and Sinclair as far as D2M in India is concerned. Excellent presentations, what I've heard so far. We've kind of traveled a long journey, and I'll talk about the journey in brief in one of the slides, but let me try to explain the problem that we are trying to solve. I think this slide has been repeatedly already been spoken about by several people here. What we are trying to say is a majority of the content, majority of the bandwidth that is created over the data networks, is consumed by video content. So I'm saying the same thing, but what I'm trying to impress upon the audience here is that the rate at which the consumption is increasing is almost doubling every two and a half years. I've said three years in this slide. It's a little bit outdated, but it's about 2.5 years. The data consumption is doubling, and that's just impressive. And if we need to densify the traditional 3GPP networks to support this kind of growth, the burden, the cost burden that will be incurred on by the mobile network operators will be simply unsustainable. And this is the way we are growing today. So how do we circumvent this problem?

The way we imagined is to create a converged network where broadcast and unicast can be selectively utilized, offloading wherever necessary, wherever possible, to create the optimum situation where the user doesn't see whether he's using broadband or broadcast or unicast or broadcast, but it is all seamless to the end user. And that's what we are trying to address. That's what we are trying to resolve the problem statement. What I'm trying to show here in this slide is the next question. Okay, we understand that we should be selectively using the two different networks, the unicast and the broadcast networks. How do we decide which one is a good candidate at what time? What we have realized is that there's something called the Pareto principle or the, if you look at this graph over here at the bottom of the screen, we have the fat head and the long tail.

What it means is 80% of the times, we are consuming just 20% of the content, and the reverse is also true. 20% of the times, 80% of the times, we are consuming only 20% of the content. So this fat head or the 20% of the content is a good candidate to offload from a traditional broadcast broadband network to a broadcast network. So that's what we are trying to... Given some examples here, the classic case of IPL, which



is an extremely good candidate to be offloaded from a unicast network to a broadcast network. Just some numbers for estimating what is the business opportunity, what is the size that we are looking at. We are today, as a broadcast industry, we are only targeting about 210 million TV households.

What we are saying is, in addition to that, we should also target the 1.15 billion mobile handsets, not necessarily just the smartphones, but also the feature phones. The feature phones specifically are the users who are not able to pay for the monthly plans. They become inaccessible, unaffordable for them. So what we are trying to say is, we create a converged network that can be used for 4K content on the television, for the smartphone users, as well as for the feature users, as well as for schools and emergency applications. So a converged solution which can be used for a very large audience. By doing so, we are also creating a lot of other business opportunities within the country. This slide talks about that. I'm not going to dwell too much into detail in that. What we are also saying is, because the applications can be for the common good of the people and satisfies the strategic interests of the country, we can categorize this solution as a DPGI.

What is this solution about? This solution includes a converged solution where we convert the broadcast ran and the traditional unicast ran. We converge the devices which can support both the unicast networks, the 3GPP networks, and the broadcast networks. And we have a converged core. What are we trying to achieve by doing this convergence? What we are trying to achieve is, for a content creator, it could be some person, some individual in some C for second place ~in the country, and he wants to create content and he wants to get to the subscribers directly on his own.

He can be a content creator just on the lines as Netflix and Amazon Prime, and he can just plug into this broadcast as a service platform and just send out his content, his personalized content to the entire country. Some more details about what we are doing. The ongoing trial in Delhi, where on the left, we have the orange light orange-colored boxes, which constitute the core network. And on the right, we have the ran network. The broadcast ran network is in Delhi, and the core network is in our office in Bangalore, which is essentially an onsite cloud, as we call it. But essentially, the core network is cloudified, and the ran network, which is the converged ran, sits in Delhi. And we are controlling the core network from Bangalore.

Some more pictorial representation of where the sites are located. The purple pins signify the location of the sites. We have created a hybrid broadcast ran, which includes the Prasar Bharati Pretoria Tower and the low-power low towers from Sanyo. This link basically shows a video. I'm not sure if you can play this link. It is-- can we play this link? Excuse me. Can we play this link? It's online. I don't know if we can do that or not, but it's a video of one of our engineers traveling in Delhi Metro. And he is watching the



broadcasted content on a cell phone, traveling at the speed of a little over 70 kilometers per hour.

Doesn't look like we can play the video live. Content-- OK, we can see that later. This is a brief history of what we've been doing, how we've been invested in Prasar Bharati and MIB since 2019. The MOU was signed to create a center of excellence. Since in 2019, we started the trial in Bangalore, followed by a larger trial with a hybrid broadcast ran in Delhi. And that is ongoing. And now the next step is to scale it up to cover hopefully the entire city of Delhi, and eventually on the lines of what was said on 16th of January at an event called D2M Summit, cover the entire 19 cities where Prasar Bharati is already present.

Some of the use cases that we have successfully demonstrated, remote education, public content broadcast, live and OTT broadcast, offload of content from mobile networks, emergency alerts, firmware and software upgrades. That brings me to the end of my presentation.

Thank you very much







# **SESSION-4**

# **Digital Radio Broadcasting-Challenges Ahead**

#### **SESSION CHAIR**

**N Thiyagarajan, IBES** Former Additional Director General



Mr. N.Thiyagarajan is a 1986 batch officer from Indian Broadcast Engineering services who began his career at Doordarshan kendra kolkata. During the span of 3 and half decades of his career he has held various positions across Doordarshan and Akashvani Network. He was responsible for Broadcast Operations, system design, Project planning, Development and Administration of Akashavani and DD Network both at zonal and National level. He also headed the National Academy of Broadcasting and MultiMedia and DD's Domestic Distribution wing for a year. He recently retired from service as Additional DG. He has been closely associated with BES (I), ABU and AIBD.

> **Ashruf El-Dinary** Senior Vice President, Radio Technology Solutions



Mr. Ashruf El-Dinary is Senior Vice President of Digital Platforms at Xperi Corporation. He earned degrees in Electrical Engineering at Purdue University (BS 1988) and The Johns Hopkins University (MS 1992), concentrating on Communications and Signal Processing technology. He has spent almost 25 years developing HD Radio technology and has earned many patents for innovative digital radio solutions. Mr. El-Dinary oversees the HD Radio systems engineering teams, manages the certification and quality control processes, and represents HD Radio technology standards at International Telecommunications Union (ITU) and international regulatory discussions. He currently leads the efforts for future broadcast applications, upgrades to emergency alerting, and deployment of digital radio solutions internationally.



#### Alexander Zink Vice Chairman, Digital Radio Mondiale Consortium



Since 2000, Alexander Zink works at the Fraunhofer Institute for Integrated Circuits (Erlangen, Germany) as Chief Business Development Manager Digital Radio & Streaming Applications. Initially he developed the mobile and location-based information system UMIS (Universal Mobile Information System). From 2001 on he focused on the professional broadcast head-end technologies "Fraunhofer DRM, DAB ContentServer". Since 2002 he has been the project director for Journaline, an interactive text-based information system for digital radio. Additionally, he works in the fields of xHE-AAC based audio streaming, AudioServers, software defined radio, transmission protocols, technology development and standardization, and IP management and licensing. For Digital Radio Mondiale (DRM) he acts as Vice-Chairman of the DRM Consortium.



Hermann Zessen Head of Sales & Marketing, DIGIDIA and KENTA

Hermann Zessen obtained a master's degree in electronics and telecommunications engineering at RWTH Aachen in Germany and an MBA at Essec Business School in France. His experience includes sales, service management, process engineering, purchasing for companies like Vodafone, SAGEM and Mitsubishi Electric in Germany and France, before joining DIGIDIA as a sales engineer in 2008. Since the acquisition of DIGIDIA by NAUTEL in 2021 he is Head of Sales and Marketing for Nautel's French subsidiary and in particular, in charge of the digital radio portfolio including DRM, DAB and Synchronous FM products.





**Akshay Raju** Senior Staff Engineer, HD Radio

Akshay Raju is a Senior Staff Engineer specializing in Integration Connected Car at Xperi Corporation. He has over 14 years of experience working on Telematics and Infotainment systems in the Automotive field. Mr. Raju is currently supporting the integration and delivery of Next Generation Connected Media solutions to all Major Car brands.







# **Digital Radio Broadcasting – Challenges Ahead**

### SESSION CHAIR

**Mr. N. Thiyagarajan:** Thank you, and welcome once again for this session on Digital Radio Broadcasting: Challenges Ahead. Before we begin this session, a few words of opening remarks. You know, radio broadcasting is a century old in India. The first-ever radio broadcast started from Mumbai Radio Club, those days it was called Bombay Radio Club, and it was in 1923. Then, in 1935, Akashvani Mysore was set up as a private company, and in 1936, the Indian State Broadcasting Organization came to be known as All India Radio. When the country became independent, we had about six transmitters covering 2.5% of the geographical area and 11% of the Indian population. From there, now Akashvani alone accounts for covering more than 92% of the entire country as well as 98% of the population. So, they have more than 750 transmitters, of which close to 625 are FM.

With the opening of airwaves, private broadcasters also started operating since 2001 in FM. We have got close to 400 FM transmitters. Put together, we have got 1,000 FM transmitters operating in our country. That is the current scenario of FM. Added to this, public service broadcasters have medium wave as well as some shortwave transmitters, and digital radio entered into India about a decade ago in medium wave using DRM. We have got a good number of transmitters functional, primarily in Simal C, and largely for analog. We have got multiple standards for digital radio. We have DAB operating in Band 3 in European and UK countries. Close to about 30 countries, if I'm right, are doing regular transmissions in DAB, plus 30 more countries are doing trials, and about dozen countries have shown interest in DAB.

Then, HD Radio is quite popular in the US, Canada, Mexico, maybe in the Philippines. I gather from the information available in the public domain that about 4,500 digital radio programs are available, and 93 million car receivers supported by more than 400 models of car manufacturers. So that is the scenario of HD Radio. DRM is also quite popular, and it's in Indonesia. They have done experiments in Germany and Russia. So, we have multiple digital radio terrestrial standards available. It's really challenging to choose one from that. Added to that, the emerging scenario of streaming that is becoming quite popular. We have many streaming platforms like JioSaavn, Gaana, Wynk Music, YouTube Music, Prime Videos, and so on. So, we have got many streaming channels becoming very popular, and even the traditional broadcasters are using streaming to augment the listenership base.

Akashvani is doing more than 250 channels on News on Air, which is a streaming platform. Even the private broadcasters are also using streaming. So, streaming is posing another competition to traditional broadcasting because the investment is very less, and anybody can set up streaming solution very quickly, so long as they own the content. According to the recent TRAI report in India, about more than 900 million subscribers are there for



the Internet. It's not only in urban areas; it is also in the rural belt. We have more than 75 million people from the rural area subscribing to the Internet. An average Internet consumption per month per subscriber is about 19 GB. That is a very substantial figure. With the BharatNet project getting through and getting completed, we will have all the villages covered through the Internet.

So, internet streaming is a reality; it is already there, and all broadcasters have to reckon with that fact. With this complex scenario, the challenges are many. Which standard to choose from? How do we go about it? What are the challenges? Especially, our experiences teach us that receivers are going to be one of the major deciding factors for any success of any technology. Besides that, the investment, how best we can make use of the existing infrastructure? What will be the return on investment? All these factors are going to decide the success of digital radio. Fortunately I am helped with so many expert speakers today.

**Mr. Ashruf El-Dinary:** Good morning everyone. It's a pleasure to be here today. I think our honorable chairman made a very important comment that radio is a worldwide medium, worldwide technology. And if you look back, earlier this week, we celebrated World Radio Day again. Over a hundred years of radio broadcasting around the world, and I think it's a very important milestone with a lot of changes that have happened over those hundred years. And right now, we kind of see that radio may be under some stress from competition. I'm here to say that I think radio is actually doing quite well and is going to be very successful.

Last year, I started my presentation talking about the future of radio. The future is digital, the future is visual, the future is connectivity. And actually, the future of radio is now. We at Xperi have done quite a bit to advance radio technology through a number of different platforms, but radio still has challenges. And the main challenge is how to remain relevant. Challenges include revenue. There's a lot of competition for revenue at radio broadcasting, and radio stations around the world are looking for new ways to generate revenue and opportunities with their assets. Another challenge is streaming, as we had just heard. Streaming media is taking attention away from radio broadcasting, and there's a sense of the visual aspect, the greater content and variety that people can hear over streaming media.

So how do we retain audience attention? How do we keep the listeners engaged? Time spent listening is decreasing, and radio is looking for ways to find and attract new listeners. I'd have to say that those challenges have been solved, and we'll talk about how Xperi has been able to do that. Our company is dedicated to broadcasting. We have a number of broadcast technologies through DTS AutoStage, not only sound but also connectivity platforms. HD Radio, TiVo which is music metadata that integrates in at the radio station, as well as radio apps from AIM and broadcast integration solutions from Rapid. So we are looking at many verticals that are able to support the radio industry.

The promise of radio is that it's an efficient medium, one of the most efficient mediums



in terms of reaching out to people. We don't need a single point-to-point connection. One broadcast can serve one person or a million people simultaneously, and I think it's the best way to get information across to the public. As we've been looking at radio across the world, and particularly in North America, yes, there is competition from social media, from mobile platforms, from TV, from streaming services. But at the end, AM and FM radio is still the largest used media across, at least, North America, and we hope to increase that as well in India.

A quick background about HD Radio. We've been successfully deployed across many markets in the world for a number of years. We have more than 2700 transmission sites covering over 400 million people right now. One hundred million products have been sold, and with that comes the listenership, the hours of listening, upwards of 450 million hours per week of listening to digital radio broadcasting. How do we do this? You may be familiar, HD Radio is a simulcast mode. It allows analog and digital to remain on the same transmission frequency through the same transmitter. It is a very efficient way of providing digital content, and with that, we have a lot of services and features that are available through HD Radio. Not just the audio channels, multiple audio channels per station (HD2, HD3, HD4), but there's also the visual experience that comes with HD Radio, as well as the emergency alerts. And most importantly, it's free to the consumer.

I think one of the points that was touched on earlier by our honorable chairman was receiver product availability, and that is probably one of the biggest challenges in the market right now. We've been able to successfully deploy a lot of receiver products worldwide. Others have been struggling with that, and I think what we can bring is car tabletop receivers and now HD Radio integrated into a phone, with a lot of visual content. So this provides a lot of compelling use cases that we can expand on, especially when it comes to advertisement, where it comes to revenue opportunities, and when it comes to user engagement.

So I wanted to focus on the power of visual ads and monetization strategies. This is not just theoretical; this is not ideas that people have. This has been done across North America with a number of radio stations really focusing on the capacity of digital radio to upsell an advertisement and get more value from that ad. There's a text-only upsell, so adding a text message to the audio ad. Very compelling and can achieve a premium cost for that advertisement. But when you bring the text and the visual together in one ad, that's where the power starts because people have that retention of a logo, they have that retention of a visual experience. With that, a lot of studies that we've done, we've been doing this for a number of years, have identified that the value of interest in the visual media, in the visual advertisement, really translates back into time spent listening at the radio station, and users are engaging with the technology more because they've got that multimedia component, because they've got that interactivity. So time spent listening is always a positive for broadcasting.

So what does this look like? Text-based advertising. We see here that this is a bank advertising with a quick slogan of their services and product. We can add program sponsors



as well. Visual advertising, you can pair that with a logo. And so now, the brand name is more recognized, and that visual experience is increasing recall of that ad. In studies that we've seen, Millennials, in particular, have more association with a visual ad than they do with an audio ad. So I think as we're looking at these challenges that radio is challenged with today, we have ways that we can improve upon that, in particular. A lot of our studies and partnerships with radio stations have resulted in increased revenue, which is what everybody in the industry is looking for. A major market brand in the US, activated visual advertisements, they're now seeing upwards of \$200,000 a year increased revenue from that visual ad. So it's a very powerful medium, a very powerful way to engage.

But we can actually take that a bit further. One of the things that we're experimenting with is adding more connectivity into the product, driving listener engagement either through a QR code in the visual advertisement or even a URL that can be linked back to a service, back to a storefront. And actually, we can demonstrate some of that at our booth today, Booth A3.

So part of the power of radio, and my colleague AE will talk about this more, is that connectivity. How do we bring broadcasting and 5G services together into a platform that allows the radio industry to thrive and succeed? AutoStage is a way of doing that by linking broadcasting with IP connectivity. We can really drive further engagement, but more importantly, once we have that connectivity in the radio station. How much time they spend on the radio station and where they listen. So this now becomes a very powerful tool that broadcasters can use to look at audience participation, think about your coverage map, and where do people normally listen? Is it on the road, is it at home? Maybe your audience is listening in one part of the city and not so much in the other part of the city. How does that then play into your advertisement campaign? How does that play into your marketing?

So these types of listener metrics can really increase the value not only for your radio station but the value for visual advertisement. So, in summary, I'd just like to say I think radio is alive and well, and the future is looking very bright. We've established HD Radio across many markets with not only the entertainment technology but that visual advertising, which has a powerful impact on the consumer. And ultimately, that will lead to stronger business cases for the radio stations, stronger business opportunities for you to continue investing and looking at new technologies. So with that, I'd like to say HD Radio and DTS, we do create innovations and create opportunities.

**Mr. Alexander Zink:** As always, it's a pleasure to be with you all. So always an honor to attend BES, yes, and speak to you. We heard a lot about the exciting possibilities of Digital radio. Now in this session, we want to focus on the ingredients for success for Asia and India in particular. I will focus on DRM (Digital Radio Mondial).

The first ingredient for success, we believe, is crucial for any adoption of Digital radio in



our country, is an open technology. One where you can build up the local knowhow, the infrastructure, chip design, and we see all of this happening in India today. As you may know, the global powerhouse for chip design on DRM receivers and chips is here in India from multiple companies, global companies even. The Digital radio standard DRM allows you to digitize all the services. India has already committed to digitizing mediumwave and shortwave transmission, and now the next digitization would be the logical one in the FM band, giving a consistent experience of Digital radio with new features to the listeners across all the bands.

This is an example of all or some of the members that make up the DRM Consortium. Everybody is invited. The DRM Consortium is an open platform to all the companies, all the regulators, all the ministries who have an interest in digitizing radio around the world using the successor technology of analog AM and FM.

The second ingredient for the success of digitization is the adoption, and coming from last BS (Broadcasting Summit), there is a lot of exciting news that happened for the adoption of Digital radio (DRM) around the world. Basically, any country in Asia, in particular, that decides to digitize their services seems to be looking primarily at the open DRM platform. Let me give you some examples.

Australia and New Zealand: New Zealand is just installing new shortwave transmitters, and they have a very interesting application. They use Digital radio DRM on shortwave to feed all the thousands of islands. People with a modern DRM-capable receiver can receive this signal in the best quality with all the advanced features directly. But to warrant the investment initially, they use this to feed the local FM retransmitter on some of the major islands. So, they bring down the cost of distribution networks overall while at the same time building up their digital services and the digital receiver population directly. A perfect example of how to introduce Digital radio.

Another example is from Nepal, where we see DRM being tested and put on air both in the AM band and in the FM band, step by step. We have the example of Pakistan, where there is a very sophisticated plan by PBC to digitize not only the FM band but also mediumwave and shortwave transmissions. And just recently, during IBC in Amsterdam, the Minister of Information and Broadcasting announced the attendance of IBC with the news and with a confirmation that the rollout plan for DRM in the country, the migration to Digital radio, is in full swing. The first big project now endorsed by the funds endorsed by the parliament will be a 1-megawatt medium wave transmitter to be set up in addition to the already existing digital FM transmitter.

Let's have a look at China. One of the big news that came out this past summer is that China is not only broadcasting and testing DRM on the shortwave transmissions for domestic services, giving close to 100% country coverage for cross-country travelers and automotive drivers. They are also now looking at digitizing the regional medium wave services. The three governmental organizations NRTA, MIIT, and SAMR issued a public request to both the Chinese automotive industry to start implementing DRM in all the



cars sold in the country going forward. But also requested the provinces to digitize their today still analog medium wave transmissions. That is a huge step, obviously, on all fronts: receiver side, public awareness, and global adoption of DRM. And at the end of the day, all these components will also help with the rollout and the adoption to further it.

In India, the probably biggest news, even bigger than in China, is Indonesia. The whole country has now published their policy, promulgated the official policy with DRM being the Digital radio standard across all the bands. That includes medium wave and FM bands for regional services, both commercial and community stations. But it also includes services in VHF Band 3, which in the country is available for radio broadcasting. So, this was the big announcement. There is a document, a very sophisticated document for the policy that you can download online. It includes all the aspects of digitization, all the planning aspects that need to be considered. First of all, it lists the bands for which DRM services can be introduced in the country. It lists the broadcaster groups that are addressed by this policy, and effectively that's all the broadcast groups: public service, national public service, regional private broadcasters, and community radios. It lists also the frequency tables at every single location, every market in the country, how to introduce Digital radio, a very sophisticated undertaking, as you can see here. And it lists also the predicted coverages of each radio market once the digitization happens.

So, obviously, we applaud them. This is a great exercise for the next step now to put those services on air. But keep in mind, DRM in the FM band is already on air in Indonesia from these five locations, high power along the coast with a primary focus on emergency warning functionality. And right now, as we speak, the work is starting to integrate Digital radio DRM, both the future transmissions and the existing transmissions that we see here, into the national cap-based alarm system. And we know that India, of course, is working on that same infrastructure. So, there's a great opportunity for synergy and learning from each other.

The third piece of the ingredient for success is the technical innovation that particularly caters to the needs of India. In the case of DRM, one of these technical innovations that we have in DRM is called multi-channel DRM. It allows us, in the FM band, to combine the best of both worlds, keep broadcasters in charge of their individual broadcasts, including up to three audio services. Whatever they want to put on air as a broadcaster but use a combined infrastructure, a single transmitter to put multiple broadcasters on air, bringing down the cost of introduction at the CTI and eliminating the need for high-power combiners, which is a huge cost factor, obviously. At the same time, for the public services, all in the radio, that is an opportunity to introduce a single FM band transmitter in every CTI location, and putting 24 or however many services you need on air for the public service, bringing local stations from various regions to every place in India, basically, all to help with a single FM band transmitter.

This is an example of how the signal can look like on the air. As you can see here, there are six independent DRM broadcasts. Each of them carrying up to three audio services plus



Journaline and all the signaling. Those six channels can originate from individual private broadcasters sharing a single transmitter, or they could be all of them from the public service broadcaster, putting multiple services on air in one location.

We also have proven recently in Jaipur together with Prasar Bharati that you can do, as you can see here, multiple power levels. The bandwidth is flexible; it only depends on the available frequency license and on the capabilities of the FM transmitter in use. So, what does that mean? As I said, it means that every broadcaster, private broadcasters in particular, for digitizing FM, we have a very easy path forward to allow broadcasters to introduce Digital radio without touching the existing analog CTI. The technical capabilities are now there. The multi-channel modulator is available as a commercial product as of this year. So, all the prerequisites are in place for people to adopt it.

The next ingredient of success would be revenue opportunities, and I'll just give you a very brief highlight. We've heard already about the opportunities with digital radio from ASU, and also my colleague Timaya will talk about this topic in more detail later. So, very quickly, as a highlight, this is a typical DRM transmission of one single broadcaster in the FM band. As you can see, it has three audio services. It has the station logos, the labels by which I, as a listener, will select my station. I don't need to memorize frequencies any longer. It has the scrolling text, the slideshow images, and the Journaline text information. All of these components are there.

What does that mean, in summary, in a nutshell, for private broadcasters in particular? First of all, they can widen the audience. At the moment, in the analog world, every broadcaster is focused on the number one audience, effectively broadcasting Bollywood music. You have five channels, and all of them, more or less, with the same audience. Addressed with these additional slots in audio, we can now address secondary audiences and audiences that have special interests. So that means we can widen the overall audiences and the market that we can address as a broadcaster. That's the number one objective. Number two objective is to really enhance the radio experience and, therefore, also create revenue opportunities and increase the revenue per listener that's on top. This is where we use elements like Journaline with its interactivity component, which gives us listener interaction. Great for ads and engagement with the broadcaster but also with the ad partners and listenership monitoring throughout the day. And as I said, we will hear more about these aspects later.

Finally, broadcasting innovation. As India is embracing DRM Digital radio more and more, I want to give you an update on what happened since last BS. Number one, the number of cars on the road with the DRM built-in at no cost for the buyer has now passed 6 million cars. That's the basis we have today, and radio is serving with their digital channels all over the country. And of course, this number is growing as we speak, week by week. Number two, emergency warning functionality. The network is ready to broadcast emergency warning functionality, and it has been tested together with All India Radio here in Delhi and NDMA. Number three, we have exclusive content that All India Radio is broadcasting



already today in digital DRM radio, not repeating the analog services because those can be received by all the digital radios as well. No point repeating the same content. So here now, we have news 24/7 as an exclusive content available to car drivers today once they have a digital radio in the car. That's something really compelling, and we have to start advertising this to the masses.

And finally, we had recently in December an activity together with Prasar Bharati, All India Radio, and the teams there, and the manufacturers, NXP, Fraunhofer, all joining forces where we looked at the current transmission configuration in Nangloi here in Delhi and found easy ways to optimize the signals there, increasing the digital component of the simulcast signal without adding additional interference on the analog classic old-dated receivers. So now we have improved the coverage in the city, and I understand there is now an activity underway to verify that, to come up with proper measurements, and to have data in black and white how this improvement of the transmission signal is actually improving the reception and the service for the listeners.

So, this is the summary. We see that Asia Pacific is embracing DRM more and more, and India, at the moment, is in the lead. We see new technical innovations like multi-channel transmissions, particularly relevant for the FM band digitization. And we have the great opportunity of revenue opportunities, and we see All India Radio taking the lead and bringing up exclusive content, working on emergency warning. All these elements that will energize Digital radio for the listeners. If you want to get in contact, just contact the dr.org project office anytime. You're welcome with your questions. We will do our best to answer them. Thank you so much.

**Mr. Hemann Zessen:** Thank you very much for having given me the opportunity to be a speaker here. I think it's my fifth time here at BES. Four times I was here as DIGIDIA, and as mentioned before, we have been bought by Nautel in 2021. So, four times I was here promoting our DIGIDIA product, mainly DIGIDIA, where we are doing our DRM, DAB, and synchronous FM. This time I'm here for Nautel, as presented, and I will present a presentation that has been created by Philipp Schmid, our CTO. This presentation covers both the main standards that you are looking at in India, which means FM, DRM, and HD radio.

The presentation will be in seven sections. So, two sections will be about the opportunities. What do you get with digital radio? You will get more audio; you will get more multimedia. The challenge, then, this leads you to more equipment, more complexity that you have to deal with. And then we have three sections on the solutions. The solutions are around IP connectivity, pushing hardware components to software, and then leveraging cloud technology. And then we have a short conclusion.

So let's start with a very basic setup. This is for HD radio. Okay, so this was mentioned before. You have in the middle an FM signal, analog FM signal, and then you have two iboc sidebands with digital modulation. This typically you can do in 200 kHz bandwidth. If



you're on one spot frequency, the two iboc signals, they are linked, they are symmetrical. They take about 5 to 10% of your transmitter energy, so you need to increase a little bit. You need to have some headroom for your transmitter power if you want to stay on the same FM power.

What do you get with this? You get three more audio channels. The basic idea is you have HD1 that will be transmitted also on analog FM, and then you have HD2, HD2, HD3 and HD4 that will be in addition. Yes, the transmitter should be HD radio certified; this is an important point. You would need to adapt your antenna and your combiners; this is an important point. And with this, you can be on air with three more channels. But this being said, you can also multiplex HD signals; this is something you could consider if you do digital only, if, for the digital-only future, no more analog FM.

Okay, in this case, what we have shown here in India in 2020-2021, is that you can multiplex three iboc signals. If you have three iboc signals, you come to 12 audio channels in total, which is not bad, and you can have it on one transmitter. You need to adapt a little bit; you know, the antenna and the combiner, you can see we did a little bit of adaption on the power of the outside iboc signals. But yes, basically, you can get on one transmitter 12 audios with this.

Now, if you come to DRM, this has also been mentioned. This is a digital standard on 100 kHz; with this, you can get three more audio channels. You have one spot frequency for this. You can do something; you can add an adjacent channel FM. Okay, this here, you have the example; we have two tuning frequencies. Then, the offset would be 125 kHz. This brings you to three more audio channels, and you can do this also on the other side. So on both sides, this looks like HD radio, but it's not HD radio. You have here an offset of, let's say, 150-200 kHz. If you have 200 kHz, you can get a little bit more power for the DRM signal and better coverage and with this, you can get six more. You would need typically 500 kHz bandwidth if you do this, and it's fully compatible, three tuning frequencies, fully compatible with FM standards. You would need two FM allocations for this. Then you can also multiplex; this was mentioned before by Alex, you can do one transmitter up to six DRM spectrum, so this brings you to 18 audios. So you get much more audio with this on one transmitter.

Yeah, the other point I will scroll through this very fast because this has been mentioned by Ashruf and by Alex before. So you can get more data; obviously, this digital radio is not only about audio; it's also about data. So this is an example for HD radio, especially with the advertising that you can adapt. This is the example for DRM. Just one word, the DRM; we call this program-associated data. These are exactly the same as in DAB, the same standardization. This is true for everybody; it's about more text; it's about pictures, and it's about structured text services such as Journaline.

So if we say you can get more audio, you can get more data, you will need more equipment; this leads you to more complexity, how to handle this. I'll have your first very basic example; this is what we have if you have analog FM today. Okay, you see on the right side;



you see a Q20 transmitter from Nautel. It's not digital, it can do only analog. It's an old transmitter; we don't sell these anymore. So it does only analog FM. So it means you will have a studio transmitter line with codecs on the studio, codecs on the transmitter, and on the transmitter side, you will do the audio processing to get your MPX signal. You will have an analog FM modulator, okay, that's integrated into the transmitter, and with this, you're on air for FM.

If you want to go for digital, the first thing you would need is a digital radio transmitter. Okay, so it's not the same. Here, in this case, we have an example; it's the GV series from Nautel. So we have these transmitters that are digital-ready. They have single-board computers on board. In addition to this transmitter, you would need digital modulators. So you keep your analog modulator, and you add a digital modulator. With this, you can then do digital radio. The modulator, just for your information, it can be software-based on the single-board computer, or it can be an external box. This is what you see here in the middle from DIGIDIA. We have one example here, by the way, on the booth. Just I mentioned this again; you need power overhead for digital. So we can help you with this. You need to do some calculations, but typically, if you have a 10-kilowatt FM transmission, you would need to buy a 15-kilowatt to also do digital. Okay, you need to think also about the combiners and antennas; sorry.

So then you need to add digital encoders. So the modulator is not enough. If you want to do digital, you need to do digital encoders. So this would be a content server for DRM and an importer for HD radio. Okay, if you say you need audio encoders, you have a different audio treatment, which means you would need to add audio processing. So here we have an example. This is an Omnia 9 audio processor with a dual output processor. We will recommend this because then, with one audio input, you can do then the audio processing for FM and also the audio processing for DRM, which is different because you do the audio encoding; you have the AC or the extended AC, audio coding that will change the color of your sound.

There is a story about the delay because if you do digital radio, the delay is longer. It takes longer for the signal to be encoded and bring to and then modulated and everything. Typically, you have several seconds of offset. So to cope with this, typically you would need to postpone a little bit your FM signal and keep then your digital radio signal. For this, you need equipment like you have here, this Inovonics one that you can delay a little bit, typically several seconds. Okay, so you would need to bring the multimedia to your chain. So the multimedia, the tick, picture slide, Journaline, all this, you would do this in the audio encoder, so that means in the importer or in the content server. You would need to add all the additional audio channels, so you come to a quite complex setup here. And the question is, how can you simplify this? How can you handle all this? There are three things, so the basic answer is you get 100% IP connected, then you put hardware boxes to software, and then you leverage cloud technology. Okay, this is the same slide I've shown before.



So the first step would be we do all the audio processing, audio encoding, delay correction, everything. This we do in the studio, and then we use an IP link to bring this to the transmitter. So this is the typical setup for Digital radio. So the modulator stays with the transmitter, and you use an IP link, and you have audio encoding to reduce the bandwidth. Then you will say, "Yes, this is good for digital, but how do we do for analog FM?" For analog FM, you would use MPX over IP, and we are currently doing some standardization work in the United States to create a standard, which is called MPXA. It's a DCP-based standard. So all digital radio standards, they have DCP-based standards for the transport from the studio to the transmitter, and so we have this MDI in DRM, EDI in DAB, and we have E2X in HD radio.

So here we have the same; it's the same standard, and what would we do? We would sample the MPX signal that you can see here. It's a complex signal because you have stereo leftright; you have the pilot; you have RDS. So a lot of information you would need to count something like four megabits per second for something like this. You can do timestamps, and with this, you can do then also single-frequency networks in FM if you want. We have the example from DIGIDIA here, and if you want to add now, we give the example here for HD radio. For HD radio, on one IP link, you would have MPXA signal and the E2X signal. An interesting thing there is, for MPX, you need four times more. So you would have 4,000 audio samples per second, and you would have something like 16,000 samples for MPX samples per second. So it's a ratio of 4 to 1. So you have more; you need more capacity for MPX than for the digital radio. Same thing for DRM; you have slightly different; you have 4,800 for audio samples and 19,200 for the MPX part.

Okay, then once we have done this, we would start to move hardware to software. Okay, there are some things that are already on the market, for example, the audio processing. Yeah, there are already software modules on the market that you can have as a software, even virtualized. Same thing applies to the audio encoder, for the content server or the importer, you can do this as a software piece. You can also do the modulator as a software. If you have a digital radio transmitter with a single-board computer, then you could use the IP, the IP delivery, to bring this to the transmitter, and with this, you would not need any more delay correction. So you have replaced many, many hardware boxes already by software with this.

And then in the last step, you would then leverage the on-cloud technology. So virtualization for the cloud, it means in this case, we call the software air chains. Okay, so you would have then the audio encoders and the audio processing on a virtualized platform in the cloud. But it can be on other things, but it's on a virtualized platform. You can do the same thing with the studio automation and the multimedia, the playout systems. All these are already software that you can install on virtual machines. And then you can also virtualize on the single-board computer on your transmitter; you can start to virtualize. It means for the modulator and also for the audio processing and the audio encoding. And then we come to something; just add audio; you just need to bring the audio to your transmitter.



So we are quite close to the first; we have more components, but you're very close to the thing that I've shown you for analog FM. Just add audio. In this particular case, you can see we have the audio encoders; we have the redundancy on them that we can use them as backup. If we say virtualization, the big advantage of virtualization is that deployment is flexible; you can have it on public cloud, private data center, dedicated equipment, or in the transmitter. So we have all cases by the way, in Europe today. There's one I just want to show you; it's not so difficult anymore and so expensive anymore to start with digital radio because, you know, the HD radio importer and the content servers, we can give this as optional software encoder modules that can be on a time-limited basi and then you don't need to buy; you will start for a trial for six months or 12 months. And then this saves you to start to check, and if you like it, then you can buy it later and activate it completely. So I'm coming to my summary. So with digital radio, you will get three more audio channels; okay, you can have up to 12 to 18 if you're on digital only. You get multimedia services; you will have a little more; you will have more equipment and more complexity. But softwarebased air chains and 100% IP connectivity will help you to make it scalable, to lower your risk, your entry risk for digital radio.

And you can have this just that audio function; it can be deployed in different; it can be deployed as cloud, private data center, dedicated equipment, or in a transmitter. But don't forget, you need the right transmitter to do all this that supports digital radio and also all the virtualization. Thank you very much.

**Mr. Akash Raju:** Thank you, honorable chairman, for the introduction. Good afternoon, everyone. Today, I'll be talking about audio's place in the connected Dash and the future of broadcast audio. Before I begin, let me give you a quick rundown of Xperi. iBiquity Digital Corporation, the creators of HD radio, we were acquired by DTS in the year 2015 and since then we saw a series of mergers and acquisitions and were named Xperi in 2017. We are a house of brands. Xperi develops and delivers its technologies through various consumer Brands, some of them you're seeing on the screen here - IMAX Enhanced, DTS, HD Radio, VEWD, and several other consumer brands. Xperi, in a nutshell, creates, delivers, and invents technologies that create extraordinary experiences making entertainment more entertaining and smart devices smarter.

Now let's get into the challenges for the broadcast radio. After the success of HD radio, we have seen more than 100 million cars with HD radio technology, and it'll be soon in India too. The next challenge is the screens in the cars are getting bigger and topped with internet connectivity. It's become a lucrative and attractive proposition for big Tech. They not only want to own the space, they want to control what content gets shown on the screen. And this puts radio in a very shaky situation because they have to give out the control, but not really. With DTS Auto stage, you can control the ecosystem, and you can own the space. You can own the content that's getting delivered on the radio screens.

Before I begin with DTS Auto stage, let me give you the evolution of connected entertainment



space. It all began with the implementation of apps. The apps that were originally built for mobile phones or living room experience, which is actually a lean-back experience, were plastered into the cars. Clearly, this strategy did not work because the car is a lean-forward experience, which did not want a lean-back experience apps to be put in. And soon after that, we saw mirroring technologies, which are still in news, where you mirror the phones on your car screens. In a recent study conducted by Experian DTS, it was found that more than 71% of those in the age group of 25 and 34 wanted a built-in entertainment experience and not mirroring their phones. And soon then, as recently as a couple of years ago, we saw video services being integrated into the car. It was great, but it's just one content service provider where there is a sea of content service providers available.

And the next thing we saw that was entertainment has transformed from being limited to audio capabilities to front and rear seat video and next frontier being the gaming. With all these technologies coming, it puts radio in an inflection point to compete with these different technologies. But not really. If the radio broadcast stations and the broadcasters incorporate DTS Auto stage ecosystem, they can still continue to own the space. They can push the content they want to be shown on the radio screens and also leverage all these other Technologies to put the radio in the front, left, right, and center of the car. And most importantly, you can understand your audiences through Auto stage's broadcaster dashboard tools where you can make better decisions on how to keep your audiences engaged.

And one of the services that's available from DTS Auto stage is DTS Auto stage connected radio. It merges the broadcast radio with IP delivered metadata services. Honorable chairman earlier mentioned that streaming platforms are coming in and taking over the space. Not really. With connected radio, it levels the playing field with streaming audio by providing high-quality engaging metadata. DTS Auto connect radio is all about aiding in discovery and providing engaging metadata that keeps the audience engaged with the radio screens. It provides additional features like streaming URLs, which act as a range extender, not actually replacing the radio stations. It only extends when the RF reception is low and provides insightful information like station information, program information, provides lyrics, local events for the stations that are currently playing.

And this is one of the Technologies, and this is the essence of Auto stage's ecosystem that's connected radio. And then recently, BMW rolled out DTS Auto stage's video services that's powered by TiVo in the US, UK, France, Italy, Germany, South Korea, and soon in Japan. And they'll be rolling out in more countries, including India. And this service is the ultimate experience for video. It brings in personalized content, first experience, and also providing free premium content for TV, video, sports, movies, all on a single screen on the car.

So the next one is DTS recently announced that we'll be incorporating all the major digital games, be it audio games, be it console games, core games, games all engineered for discovery and personalized for users' preferences, all the while ensuring that games are



played safely in the car and radio can leverage this and push content for gaming. So last year when I was here, I had given out a roadmap of how many cars that are launching. So there were 70 plus models that we had projected that will be launched. And it all started in the year 2021 with Mercedes-Benz launching Auto stage, which is also available in India. And then we had to change that projection from 70 models. We are now projecting that there will be 175 plus models that will be incorporating DTS Auto stage in their cars. And this is a validation for DTS Auto stage and consumers' wants, which is a built-in entertainment experience that is personalized to their own user preferences.

While I talk about Auto stage, I'm walking the talk about it. So here I show you the Tesla's integrated Auto stage programs on their radio stations. So you're seeing station logos, station names aiding in discovery. And then we saw like Hyundai, Kia, Genesis, all these models from the Hyundai, Kia, Genesis platform have DTS Auto stage. They provide program information for the currently playing station. They provide station logos, station names. And then we have Ford and Lincoln, which recently announced that they will be incorporating Ret Auto stage, and it's already in the roads right now. And lastly, Nissan has integrated DTS Auto stage too. They provide station information, program information. They've incorporated lyrics, radio recommendations, podcast streaming audio all together with the radio, which shows that radio is still relevant.

I recently mentioned that DTS Auto stage video Services were rolled out in BMW. They'll be rolling out in all of their models through over-the-air dates. And also, it will be available in India, hopefully soon. My colleague earlier mentioned about how DTS Auto Stage Works under the hood. DTS Auto stage ingests data from all the broadcasters, be it large broadcaster who are technically savvy and know how to push program information and live information for the songs. And we also incorporate data from individual broadcasters, some have the means, some don't have. And we also incorporate ingest data from mom and pop broadcasters. Once we ingest all this data, we also provide them editorial tools to push their content. We want them to control the space. And once they have pushed their content into our system, we will pass through our content curation catalog, which enhances the station's information and provides much more information such as high-resolution imagery, lyrics, local events, and other information for the radio, which is beneficial to the radio listeners.

In addition to that, the Auto stage ecosystem is an automotive-grade platform which has 99.99% uptime, and it has indecency filtering. It covers the cybersecurity, and it has a roadmap that grows with your needs and while protecting the customer software investment. By that, I mean, we are IP protected through and through. The broadcasters don't have to worry about pushing the content. The radio manufacturers and the car companies don't have to worry about showing DTS Auto stage's ecosystems features. With all that, the story of your station gets all the more interesting thanks to DTS Auto stage dashboard and editorial tools which allows you to look into the insights of what your customers or consumers of your radio are doing and how you can keep them engaged.



So before I go into the dashboard, I wanted to give you an overview of Auto stage. It's a well-established ecosystem. We have a presence in over 144 countries. We have 100,000 plus broadcasters who are working with us in pushing their content. And then we have over 6 million cars now which will be soon tens of millions of cars. And year to date, there are over 3.5 billion hours of listening of Auto stage and over 25 billion music and non-music events that have been pushed through Auto stage ecosystem. With all that, when you get access to the Auto stage dashboard, you'll get to know who your audiences are, where they are listening from, when and what and how they're listening to the content of your radio station.

Odyssey Group, which is the second largest broadcasters in the US market, have given us permissions to show their dashboard. So this is how their dashboard looks like. It contains all the radio stations and their station information, the live information of the song, and the insights of how the reach of the stations are changing day to day. I'll just quickly jump into the next one, so you will be well represented with DTS Auto stage in the cars. Your imagery that you're sending are shown like the ones that you are seeing on the screen. The editorial tools contain station information where you can push content like logos during holy. You can play holy-themed logos during Diwali. You can send Diwali-themed logos so that you are catching the pulse of your customers. And then, now playing information. You can send the song information through Auto stage ecosystem. Then we provide detailed analytics for your station. So some of the detailed analytics, this has excited our station partners. It'll provide you how long your station listeners are tuned to. What is the duration? How many sessions were active throughout the course?

Not only that, it'll give you an a daily activity of your station. You can see in the midnight the listenership is low. And as the day progresses and during the peak hours, it increases exponentially, and the listenership maintains till 7:00 p.m and it drops again. And this pattern keeps changing per day-to-day basis. The most important one that my colleague earlier mentioned was the heat maps to know where your customers are listening from. This has helped many broadcasters to boost their transmission relative to their transmitter location in places where they didn't know they had audiences listening from. These are some of the stations that have.

And then if you provide us with now playing information, we'll let you know the top 20 songs that are playing on your station. With that, I would like to conclude that this dashboard is free to the broadcasters. There's no cost associated with it. You control this dashboard. You push the content, and we monetize by selling the Auto stage ecosystem to the radio manufacturers. DTS Auto stage ecosystem is the next generation infotainment platform comprised of only global connected media solution that aggregates and delivers content for gaming, podcast, radio, TV, most importantly, radio. And then provide additional functionalities like personalized content discovery, recommendations, monetization opportunities for the radio broadcasters and as well as the radio manufacturers.

With that, I would like to end my session.





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# Mr. S. Krishnan, IAS,

Secretary, Ministry of Electronics & Information Technology (MeitY)

Shri S. Krishnan, a 1989 batch IAS officer, was appointed as Secretary, Ministry of Electronics and Information Technology (MeitY), in September 2023.ShriKrishnanhasbeenatthehelmofvariousrolesoverthelast32years, including his appointment as the Finance Secretary for the state of Tamil Nadu, and Chief Executive Officer of the Tamil Nadu Infrastructure Board. He graduated from St. Stephen's College, Delhi University, and holds a Masters in Economics from Annamalai University.

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### Mr. S. Krishnan, IAS,

Secretary, Ministry of Electronics & Information Technology, Gol

## SPECIAL ADDRESS

Ladies and gentlemen, good afternoon. I am honored to be here, and I want to express my gratitude to Mr. Sunil, the organizer of this Expo, and to the distinguished Mr. Shiban K. Koul, Professor from IIT Delhi, and other familiar faces in the audience.

I appreciate the opportunity to address you right after what was possibly a fairly heavy lunch. It's not the organizer's fault; I specifically requested this time slot, and I thank you for accommodating my request despite any inconvenience it may have caused.

Now, you might wonder about the relevance of the Ministry of Electronics and Information Technology to an event focused on broadcasting. The truth is, in many parts of the world, including India, the realms of electronics, information technology, telecom, and broadcasting are converging. They are often grouped under a single department, such as the Ministry of Digital Communications or Digital Technology. This convergence is driven by technology, and it's a global trend.

I remember when I lived in the United States; my television, telephone, and internet all came through the same cable provided by Comcast. This bundling based on technology is becoming more common, breaking down the silos that traditionally separated these sectors.

The Ministry of Electronics and Information Technology approaches these developments from a technological perspective. While some argue that certain projects are not strictly "electronics," my response is that, in essence, it is all technology. Whether applied in the medical sphere, communication, or broadcasting, it all comes down to technology, either in the form of information technology or electronics.

Technology is advancing to the point where various devices are consolidating into one. In the past, tourists carried cameras and other gadgets, but now, a mobile phone often serves all those purposes. The challenge, however, is that content is increasingly being delivered through a single device. This raises questions, such as the impact of direct-tomobile broadcasting on existing infrastructure and spectrum usage.

Direct-to-mobile broadcasting, while technologically possible, poses economic and regulatory challenges. Issues of free ridership and leveraging existing infrastructure need to be addressed through appropriate regulations. Nevertheless, technology marches on, and we can't halt progress.

As technology becomes more accessible, even what was once exclusive to strategic sectors will become widely available. The internet, initially a defense application, is a prime example. The key is to address economic, regulatory, and political economy



questions as we progress.

The Broadcasting Engineering Service's Expo 2024, which cuts across technologies and jurisdictions, is commendable. Media, often referred to as the fourth estate, is a crucial pillar of democracy. The Ministry recognizes the public service aspect of broadcasting and aims to balance technology's advancements with strategic and long-term considerations.

The convergence of technology in the telecom, broadcasting, and information technology spaces challenges existing regulatory paradigms. As we regulate internet intermediaries and adapt to developments like artificial intelligence, the traditional characterization of these sectors being differently regulated may change.

In conclusion, the dialogue between regulators and participants from various sectors is essential. The goal is to preserve fundamental values while leveraging technology for societal good. The Broadcasting Engineering Service's Expo provides a platform to showcase evolving technologies, and I extend my best wishes for its success.

Thank you for having me, and I believe this sector holds exciting possibilities in the evolving economy and political landscape of our country. Let's work together to deliver the best to the public.

Thank you.




### Mr. Shiban K. Koul

Emeritus Professor, Centre for Applied Research in Electronics, IIT Delhi.

Shiban K. Koul received the B.E. degree in electrical engineering from Regional Engineering College, Srinagar, India, in 1977, and the MTech. and Ph.D. degrees in microwave engineering from the Indian Institute of Technology Delhi, New Delhi, India, in 1979 and 1983, respectively. He is an Emeritus Professor with the Indian Institute of Technology, Delhi since 2019 and Mentor Deputy Director (Strategy & Planning, International affairs) with IIT Jammu, J&K, India since 2018. He served as Deputy Director (Strategy and Planning) with IIT Delhi from 2012-2016. He also served as the Chairman of Astra Microwave Products Limited, Hyderabad from 2009-2019 and Dr R.P. Shenoy Astra Microwave Chair Professor at IIT Delhi from 2014-2019.



Broadcast Engineering Society Confers the HONORARY FELLOW & BES EXCELLENCE AWARD to Mr. Shiban Kishen Koul for his exemplary contribution to Microwave Research and Satellite Broadcasting



## **SESSION-5**

# Changing landscape of Satellite communication: New Horizons for Broadcasters

**SESSION CHAIR** 

**V.J. Christopher** Wireless Advisor, WPC, Ministry of Telecommunications, Gol



Mr. V.J. Christopher joined WPC Wing in the year 1991. He has working experience of more than 30 years in Spectrum Management.The major areas of work include Spectrum Planning, Licensing, Spectrum Auction, Radio Monitoring and Satellite Monitoring. He has worked in different Units of WPC and WMO. He also participated in various international conferences and study group meetings of ITU-R including the World Radio Conferences.In November 2022 he was promoted as Wireless Adviser in the Department of Telecommunications.

**Anil Prakash** Director General, Space Industry Association India



Mr. Anil Prakash, is a highly experienced professional with a rich background in Government Relations, Regulatory Affairs, and Policy Frameworks. With a strong techno-commercial expertise in Telecom, ICT, and the Space Sector, he brings 37 years of valuable work experience to the forefront. For over two decades, Anil has actively contributed to the initiatives and activities of the International Telecommunications Union (ITU), making significant impacts on its operations in India. He is a proactive member of task groups established by government bodies, telecom associations, and chambers of commerce. Over a span of more than three decades, Mr. Prakash has effectively showcased his expertise at major international conferences. Currently, Mr. Prakash serves as the cofounder and holds the position of Director General at SIA-India, a recognized Space Industry Association in India.



Sanjeev Gupta Associate Director, SATCOM, ISRO



Mr. Sanjeev Kumar Gupta, a senior scientist from ISRO, is working as Associate Director, Satellite Communication Programme Office, ISRO HQ, Bangalore. He did his BE from Engineering College, Kota (today, Rajasthan Technical University, Kota) in 1999 and his Masters in Engineering from Indian Institute of Science, Bangalore in 2008. His contributions are immense in design and development of TT&C systems for remote sensing and inter planetary mission. Currently, he is contributing in implementations of SatCom based applications, like Telemedicine, Tele-education, Disaster Management, VAST connectivity, etc, which have a greater social relevance. He works for implementations of Earth stations of high throughput Satellite and utilization of communication satellites for various services, after they are placed in the orbit. He is a recipient of Team Excellence Awards of ISRO for "RF systems for Mars Orbiter Mission".

Harsimranjit Gill Country Manager, Intelsat



Harsimranjit Gill currently heads Intelsat's India business as Country Manager. Responsible for managing strategic customer relationships, regulatory coordination and business development for new products and services. With 18 plus years of Industry experience worked across Media, Pay TV, DTH-Cable, OTT and satellite domains. Prior to Intelsat, as Wyplay's VP-Sales, Mr. Gill was instrumental in setting up an India office and business expansion in the region. He has expertise in creating go to market strategy for new solutions and managing market development for complex technology solutions. He has experience of leading sales for technology leaders like Irdeto, Hughes and ATX Networks.



**Gurvinder Chohan** Founder & CEO, QSTC Inc



Mr. Gurvinder Chohan (B. Eng., MBA, M.Sc (Business law)) has over 28 years of in Aerospace and defense sector. Mr. Gurvinder Singh Chohan is affiliated with numerous professional and non-professional organizations and was granted the Canada Sovereign Medal by the Governor General of Canada. He is the founder and CEO of QSTC Inc (formerly AQSTC Space group USA). QSTC is one of the leading companies providing space solutions in area of Quantum, Smart Satellite platforms, Communication and Remote Sensing Solutions.

> Nilanjan Routh Chief Manager, New Space India Limited

Mr. Nilanjan Routh is Scientist SG at Department of Space , government of India and currently deputed at New space India limited (NSIL) the commercial arm of Indian Space Research Organisation. Nilanjan heads the business vertical of satellite services at NSIL. An engineering graduate and post graduate in management, Mr. Raut has 18 years of Executive experience in both corporate and Isro put together. He's a recipient of ISRO young scientist merit award.



# Changing landscape of Satellite communication: New Horizons for Broadcasters

#### SESSION CHAIR

**Mr. VJ Christopher:** Good evening to all the delegates from the industry, government, academia, and students. A warm welcome to this session where we will delve into the changing landscape of satellite communication. This discussion will encompass technical, regulatory, and economic aspects, including space policy. Our focus will be on satellite communication, particularly for broadcasters.

We are fortunate to have four distinguished speakers who are experts in satellite communication. They will provide insights into this dynamic field. In 2023, two significant events unfolded in this domain. First, the Indian Space Policy 2023 was introduced, marking a substantial shift after the 2000 satcom policy. Second, the new Telecommunication Act 2023 replaced the age-old Indian Telegraph Act of 1885 and the Indian Wireless Act of 1933. These legal frameworks form the foundation of the regulatory landscape for satellite communication.

The current space economy is valued at USD 8.4 billion, representing a 2% share in the global market. Projections suggest that it could reach USD 44 billion in the next decade, with a three-fourth attributed to the domestic market and a quarter for exports. These estimates are in line with the insights provided by InSpace. Let me now call upon Mr. Sanjiv Gupta to talk about the new space policy and the impact, along with other regulatory aspects. The vision statement of the Indian space policy is to augment space capabilities for the nation's socioeconomic development. So, I invite Mr. Gupta to talk on this topic.

**Mr. Sanjeev Gupta:** Good afternoon to all. I'm just covering the satellite communication. What are the emerging trends in the future? What are the opportunities and about the Indian space policies? So I will just touch upon how ISRO is started. Generally, in terms of satellite communication, and how it's helping in different domains especially broadcasting, vet services, and other things. So, in 1980, we started our journey with the INSAT-1 Series. In that, we procured four satellites, all working in C-band and S-band. These satellites were used for telecom, broadcasting, and meteorological purposes. In the 1990s, the INSAT-1 Series was replaced by the INSAT-2 Series, which had five-engine satellites. Again, all these satellites were used for broadcasting services in C-band. In the year 2000, we moved to the INSAT-3 Series, where the DTH services started in Ku-band. For the first time, we introduced the Ku-band in the year 2002. Until today, we have 18 satellite operations in the orbit, out of which 11 satellites are for commercial purposes and three satellites for high throughput satellites. These satellites altogether have 317 transponders in different bands



- S-band, C-band, Ku-band, and Ka-band, providing 25 Gbps high throughput capacity for future broadband applications.

See, this is the Indian Arc where we have a total of 18 satellites from 48° East to 97° East orbital slot. Out of these, 11 satellites, recently with the new space policy, 11 commercial satellites have been transferred to New Space India Limited, which is the commercial arm of ISRO under DOS. And today, we have a total of 300 plus transponders and 25 Gbps capacity to meet our Indian sector requirement. Apart from that, we are leasing foreign capacity from different satellite operators. Today, we have leased 111 transponders from different operators and 2 Gbps higher satellite we have leased. And today, the broadcasters from nine satellites, 40 transponders, these broadcasters directly have leased in C-band capacity. These are the various satellite applications where satellites, direct-to-home services, TV broadcasting, DSNG hits, broadband services. These are so many applications which our satellites are being used for, mobile satellite services, strategic services, societal applications, radio broadcasting, and V-Sat services.

Today, future applications like direct-to-device, IoT, machine-to-machine, IG are emerging. So, the demand for these satellite capacities is increasing in coming years. In satcom, we have the government and public users as well as non-government users. Our strategic users, defense services, are using satellites for communication purposes. Securities, we are using satellites for societal applications, governance, and similarly, we have one satellite for internal bilateral cooperation among the nations. Similarly, our DTH operators like DD, Airtel, Dish TV, SunTV, Direct Tatplay, they are all using our Indian satellites and DSNG. So many D-Teleport operators, DSNG operators, VET networks, and new application is IFMC. TataNet and VSNL are providing in-time and flight and maritime connectivity through our satellites.

If we see the demand, the demand is growing in satellite capacity. Demand is growing day by day. We have done an assessment in the year 2019 with that. Today, total 100 Kuband transponders are being used for DTH services and broadcasters have projected an additional 87 transponders for the DTH services. Similarly, in C-band, today, India has 96 transponders in their satellites and 40 transponders we have leased from the foreign satellites. Still, we have the demand for the 89 satellites in the C-band. So, that way, we are seeing the total service distribution. If we see, for 25% capacity is being used for DTH services and 10% capacity, this 16% capacity is used by the teleport operators and 46% capacity is being used by all the private players in our country. Similarly, the new high throughput satellites today, India has the capability for 25 Gbps capacity will grow up to two capacity demand will grow up to 250 Gbps gigabits per second.

So, for broadcasting, India has the different kind of satellites. The C-band satellite has a very broad coverage from Europe to Australia. So, broadcasters, all TV teleport operators



are using our C-band satellite. Similarly, our DTH operators are using Ku-band satellite which has the India coverage. Now, these are some of other satellites like HRUT satellite which has the coverage spot beams all over India. Similarly, we are having one dedicated satellite over Jammu, Kashmir, and Northeast for broadband services. Now, the satellite technology is evolving. So, now, a new class of satellite is HRUT satellite which is basically being used for broadband purposes. For a general bandpipe satellite, the transponder bandwidth is generally 36 to 72 MHz and each satellite will provide the capacity up to 1 to 2 Gbps. But in new HRUT satellite, the same spectrum is being used multiple times in Ku and C-band and the satellite is providing capacity up to 100 Gbps because they have multiple narrow beams. So, power is more, the more amount of data can be transmitted through HRUT satellites.

India has launched three HRUT satellites. These are very powerful. The first satellite is G9 which has the 3.5 Gbps capacity. Next satellite is GSAT 11 which is providing broadband connectivity to the Grand PCH under BharatNet program which has the capability up to 16 Gbps. And one HR satellite, GSAT 29, which has a dedicated cage over Jammu, Kashmir, and Northeast. And ISRO is now going to launch one more HRUT satellite, G 20, which will enhance the 48 Gbps capacity in our satellite program.

Now, the new class of satellites like LEO constellations are coming up. These satellites are basically for real-time applications like IoT, gaming, and all. So, LEO generally, LEO, the advantage of LEO is they have very low latency up to 50 milliseconds. So, these are basically very good for real-time applications. This constellation can be used for broadband and cellular backhaul connectivity with global coverage, providing connectivity to ships, air terminal vehicles, and it can be used for surveillance and imaging. They are having very low latency in their applications. Similarly, but, to maintain, they have the multiple satellites have to be there to cover the entire globe. So, there is a challenge to maintain these satellite constellations. And for tracking the satellite, you need the tracking antennas and which has the high-cost terminals and controlling satellite and managing the data also is the issue in this. This is just the basic difference between GEO and LEO.

GEO satellite is mainly very good for broadcasting application. LEO will be very good for real-time applications. These are the new applications which will come up with the new technology, Internet of Things, consumer broadband, directly like DTH. Now, you will have the broadband connectivity at your home. similarly, 5G, 6G is coming up. You need more backhaul connectivity, so satellites will provide more capacity for those technologies.

Now, I will cover a little bit about the Indian space policy. In 2023, the Indian space policy came out. This policy provides the freedom to carry out all space activities by non-government entities and private players. Now, private players can design, develop spacecraft. They can establish and inaugurate. They can establish the assembly facility in India. They can provide capacity for various services within India or outside India. Now, Indian entities can bring NGSO and GSO systems into operation with ISRO's space authorization. In space, the Indian National Space Promotion and Authorization Center, which is under the



Department of Space, will handhold NGSO for establishing space objects. Indian entities can also establish satellite control centers, telemetry centers in India. All regulations about communication services are under the ambit of the Department of Telecom, and broadcasting-related regulations are under the Ministry of Information and Broadcasting. Now, even foreign players can collaborate with Indian entities to have a joint venture or establish their subsidiaries. They can avail FDI as per the Government of India policy. With this policy, it aims to level the playing field between public and private entities.

For service providers, they can hire capacity directly from authorized space assets. They are free to make commercial arrangements directly between the space segment provider and the service provider. Now, to enhance orbital space resources, under Indian administration, use of non-Indian orbital resources is permitted with a condition that those resources should eventually come under Indian administration. So, the orbital resources acquired by Indian entities will be permitted for use as long as it ensures services by maintaining the operation of the space system. Now, any entity which has acquired or is in the process of acquiring Indian orbital resources can transfer the use of such resources to another Indian entity with permission from ISRO. The unoccupied orbitals under DOS will be made available to Indian entities as found appropriate and decided by DOS. ISRO can prescribe the methodology for allocation of these identified Indian orbital resources to Indian entities. So, these are just roles defined by the Indian space policy. The roles are defined between the space object and the regulators. So, in the satellite system, any entity can establish a satellite system with authorization from ISRO. They can establish TTC systems and all, but all regulatory related to spectrum and network planning are under the ambit of the Department of Telecommunication, and for broadcasting, it is under the Ministry. Thank you.

**Mr. Anil Prakash:** Thank you Chair, Krish G, and, I'm really honored and privileged to be here in the Galaxy or the broadcast fraternity. Thanks to SG, who is the President of BES, and, I'm really feeling at home after a year. This panel looks very balanced; I think the organizers have given thought to it. We have a spectrum manager, which is on chair. We have IS, SatCom PO, Office of VIS, which designs satellites and Orchid satellite for insertion. And we have NSIL, which is a commercial arm of DOS. And we have one satellite operator and one satellite design manufacturer. So, it's a wonderful panel we have today. I'm really grateful.

So, I'll limit my presentation to 10 minutes, as the Chair has advised me, and I'll not repeat some of the points which our previous speaker, Mr. Gupta, has addressed. The topic given to me is the new paradigm for Indian broadcasting, and this has been covered by Mr. Gupta, so I will not touch upon that. Shows the plethora of services being provided by satellite: number of social, number commercial, and economical and disaster mitigation done by satellite. I'm not going to dwell upon it. I'll just quickly touch upon it.

My previous speaker, Mr. Gupta, talked about the evolution of the satellite. I would like to



put it in three buckets: the evolution. First of all, the traditional broadcast satellite, we used to be then inant, entrance of the high throughput satellite, which now is there and which is a large bandwidth. Now the origin of Leo Earth orbit satellites, and we are going to witness by this October, the first satellite coverage or satellite connectivity by one WEAP. So, I think we're going to witness and followed by Starlink. So, the number of Leo satellites is going to be covering the sky. I just want to touch upon this, been touched on by Mr. Gupta already. We have seen this; this has really broadcast has done something which is really unique for India. He has connected the people, the air, and the radio and television has connected to the far-flung the people which has not normally been. And after liberalization of 70 years, we still there area is still not able to connect. So, this is not a kind of agony in terms of the policy and in terms of the regulatory mechanism which still avoid digital connectivity to the people who are still living in remote areas and how it can transform their life once the digital connectivity reaches them. I just wanted to this is all also been covered this how Satcom impact on the broadcasting industry through this all various of services. I'm not going to dwell on this because of the paucity of time.

This is the major advance stage which has been talked about. I would like to just stick to one account which is this is going to change, which is going to be a paradigm shift in terms of the broadcasting era which is direct-to-device. I think the previous I think in the morning there was a session or directive device and this is going to change. It's going to be a game-changer in terms of the you don't have to carry, as the Min secretary mate has in inaugural speech this afternoon. He said about because everything is under your palm, under your control. So, it is the broadcasting. So very, very soon we're going to witness, we're going to enjoy the liberty and having flexibility of using Broadcasting Service on your existing mobile handset. You don't have to change anything on your exist. That is going to be a paradigm shift.

This industry has got a tremendous potential for growth and as it's said that there are about 9900 channels, 21 CR household. There are about 1730 digital platforms operated by close to about 50,000 cable operators, and it gives employment to 1.83 million people. And I read that this brings a revenue of 70 billion in the broadcast industry, and this has a large potential and I'm coming upon is this potential how it is getting.

Now look at this. My friend has also touched upon that broadcasting hist prima divided into C and Ku band, and Ku band, you know, is used for DT service, and C band is used for the broadcast Service. And this next slide shows how though it looks like the reach worldwide and it has got a much better reach into these areas, and this shows the word how this C band, how connected most of the world it is been B2B service but look at the region, which is here which is a Asian, Indo Asia region which has not only B2B but is also going to B to C companies and this band is much larger so here we have to protect this because there already the exist Services going into this direction so of course spectrum manager is very wise it go with the policy advice and how things but I think we have to somehow preserve the Spectrum into the IT align and design frequency band and we have just witnessed in



the conclusion of the WRC 23. I think next session Mr. Ripa will talk about the outcome or discussion which WRC has but it is clearly defined the rule for all the players whether is a tal or whether is a satellite they have defined a set Spectrum for that and we hope that we follow that dictat and Global harmonization on that.

My final thought is my final slide, a few takeaways. First of all, we have to embrace Advanced satellite technology which covers all SDS, Leo, MEO, and there's a new tier is also been talked about. We just concluded our death set last week and there is a near space so there lot of activities going on in the near space which is in between close to below the line and we have to this has good beauty of the expanding Global geographical coverage as you know that satellite is something which is not controlled by the sovereignty because once it goes up and it can serve a number of countries so that our flaws policy and regulations should be globally aligned and we should follow the international treaty and we should be aligned with the international treaty on that we should facilitate industry collaboration.

You know the ISRO has done wonder they have really brought forth India on the top of the map on the space capabilities. We Stand Tall in the four League of nations in which we have deep space exploration Poss capabilities. We Stand Tall among Seven League of nations which we have the launch capability and then we also have the collaboration our friend Mr. Ginda Chan is here is going to talk about it being Indian but his heart is here he work for can in Canada he a really successful company he's been working and they they have designing a number of payloads which can work with the manufacturing unit in the country so he will talk about that so we have to expand a global collaboration and we have to seize the growth opportunity which capitalize and growing demand of satellite capacity driven by over the top streaming services.

Lining satellite technology to create new Revenue stream and business opportunities we should encourage infrastructure investment. The investment is a key we still hoping that FDA policy will be announced soon we're still waiting that FDA policy should be conducive enough to bring a foreign direct investment in the space sector so we hope once it comes I think that investor will definitely be looking forward to investing in the country we must ensure regulatory policy clarity and certainty we shouldn't change the rule of the game middle of the way. I think our policy has to be longstanding and it should go a long way to serve the purpose. At the same time, it has to be dynamic because the technology advancement is taking so fast every 3 years the technology leapfrog to the new world. So, our policy regulation has to be agile in terms of the so so dynamic they can work on those promote Spectrum I touched upon. We have been victims of the broadcast sector as a large chunk of spectrum is been taken away, very efficient band of the C band, and so we have still keep looking at the jolt which has come is will still trying to survive how we are going to cope with that and I think there's a major blunt has which is taken in the broadcasting sector I think we should have ensure the availability the Spectrum so that it put to efficient use support research and development of course we allow it to flourish not only the public sector but in the private sector domain. I think, as an industry



association we are encouraging our industry to open their doors for the companies which come and you know because they have built up certain capabilities certain manufacturing facilities some testing facilities so this should be open to the startups MSME to work upon of course promote content diversity utilize Satellite Communication flexibility to deliver diverse content type including the events prerecorded programming emergency broadcasting to various audience of preference and needs utilize increase the BI already on this new high definition ultra high definition content is coming and flowing and I think the seamless flow of the content from one domain to other should be allowed we know that we most of them are victim of OTT regulation now the new bug which is bugging us the AR artificial intelligence which is bothering us a lot of course again I touched upon that facilitate International collaboration partnership without that I think we are not doing good for ourselves I think if we have to do good for ourselves we need to open the door for foreign collaboration this is about us we are a nonprofit industry sector industry body we deal with the space sector and these are our membership which covers all who in terms of satellite manufacturers satellite operators launch Vehicles startup Academia law forms Etc and this is our next events I look forward to inviting you there this is a 26 to 28 India space Congress which is truly International Event in India thank you very much.

**Mr. VJ Christopher:** Thank you, sir. So, Sir has covered a wide spectrum from satellite capacity, its applications, and the demand that is projected. He has also touched upon the, you know, high throughput satellite, which is coming out with a very high capacity, up to 100 Gbps capacity. So, this is the evolution of this satellite from 1980 to 2023. Now, you may, he has also stated that the Department of Space has now three components defined. One is called Department of Space ISRO, which is for R&D and Technology development. We have InSpace, which can regulate and promote the industries, and there is NSIL, which is a commercial arm of the Department of Space. So, the important part, whatever he has covered, is about the NG, that is, non-governmental entities. They are going to be, you know, there in the value chain in the coming decade. That is what the government expects them to do. They have to come in, you know, in all facets of satellite building, rockets, satellite launching, operating, then data acquisition, dissemination, all areas now are open to them. So, InSpace is the agency which regulates the space component of this entire value chain.

**Mr. Harsimranjit Gill:** Good afternoon, everyone. First of all, thanks to Mr. Sunil, President BES, for inviting me to the panel. I'm very happy to present the satellite communication industry perspective during this session. My name is Harsimranjit Gill, and I am the current country manager for Intelsat in India. Now to the topic at hand, which is the changing landscape of satellite communication and New Horizons for broadcasters. Earlier speaker Mr. Sanjeev Gupta has very well covered the types of orbits, different satellites that are possible, different use cases, and what are the new technology advancements we are looking at in the satellite domain. So I'll try and focus on the second part of the topic. A



bit about Intelsat. Intelsat, as an organization, is 50 years old. We deliver content to over 2 billion viewers every day through our global satellite network. We connect seven out of the top 10 mobile network operators globally, number one in maritime communication, and connecting over 3,000 aircraft globally with broadband services. We have 52 geostationary satellites, 62 teleports and points of presence, close to 2 lakh miles of fiber connectivity, and we handle 1500 terabytes of carrier-grade traffic on a daily basis.

Intelsat has been an old name in India, and over the last three decades, we had a history of working very closely with ISRO. Initially, we had collaboration with ISRO for joint payloads, and we continue to work with ISRO in terms of satellite-related services. In addition to that, we currently handle more than 50% of media traffic over India. All the content delivered, all the broadcasters, all the live channels, we handle more than 50% of that content.

Since the last two years, we have had partnerships in India with the local teleports and hubs, and we have started delivering mobile connectivity services, in-flight connectivity as well as maritime connectivity. In-flight still not available on Indian operators, these are international carriers who were not able to connect when they would enter Indian space, right? So now they are able to provide seamless connectivity using our Indian satellites.

A bit about the media industry. All of us have been hearing for the last 10 years that television is dead, right? OTT is coming, nobody's going to watch live TV, it's over, the game is over, right? But that's not the case. We see that television industry, yes, under stress, there's always mergers, there's shakeups, but the television industry, the live broadcast industry is alive and kicking. There is a little bit of restructuring because the OTT service providers are going to gain a little bit of market share in an old industry. So obviously, you're going to see a little bit of decline, but we still see television holding close to 40% of the market share in the Indian media market, over \$1 billion as of today.

A bit about the overall television trends. There is a 2 to 4% year-on-year growth in terms of the television households. So that's primarily driven by an increase in incomes. Let's say when more people are able to buy TV and buy connectivity services. So this is the reason for that. But we do have an 8% decline in the ARPU because the market is competitive, cheaper OTT options are available, so they're pushing the ARPUs on traditional PTV operators on the downside. So the average time we are spending on television is increasing, overall TV spend on advertisement is also increasing.

A little bit different way to put the same point. You can very clearly see here that currently the market size for media in India is close to \$30 billion, and the projection is close to \$65 billion by 2030. But if you look at the top, the gray block, you will see the overall size of the television market is eventually going to be the same, the percentage may come down a bit because OTT is gaining, but the overall market is also expanding in parallel.

Okay, so what are we doing as Intelsat, right? So we are seeing a shift in the media industry where it's not a choice between live television and OTT, rather we see the future as a hybrid future where live TV is equally important as well as the OT services that you can watch



on your mobile or portable devices. So we are working on a unified network where the satellites could be spread across different orbits and could be directly from Intelsat, could be from partnerships.

We are building a terrestrial network of fiber optic, connecting all of our points of presence around the globe. We are working to open the architecture in terms of the standards and everything for satellite to be more compatible with the 5G evolution so that it's easy to merge together the terrestrial mobile network with the satellite-based services going into the future. So this is the vision of the future. So, on top you see geostationary satellites, that's where we operate today on those 52 satellites. This second part is the Middle Earth orbit satellites which Intelsat is currently building to be launched by 2027, and the lowermost part of the diagram is the low Earth orbit satellites where we are partnering with providers like Starlink and OneWeb to have a sort of exclusive partnerships over a certain country and provide flexibility to the end consumer.

Because if you look at the geostationary satellites, they have mostly been used for a wider coverage, for example, covering all of India or even the South Asia region, right? And that use case is continuing to move forward, that is never going to go out of fashion because you will still need to deliver the same type of content to a large audience, especially for a country like India. But we see that there are new use cases where you need a two-way connectivity like broadband connectivity to your phone where there are mission-critical use cases and the latency becomes quite critical, right? That's where we see the lower Leo orbit satellite providers playing a key role in mission-critical and low latency applications.

A little bit on the next evolution for the geostationary satellites. Currently, Intelsat is working on what we call as software-defined satellites. So as of today, satellites always had more or less fixed coverage. The wide beam satellites had a country-specific coverage and high-throughput satellites could have like six or seven beams providing coverage over the country. But software-defined satellites take it to the next level where you could have probably more than 50 beams providing coverage over India, but all of those 50 beams are configurable. You can literally chase an aircraft which is started from Shagar and is going to Kerala. You could provide a dedicated beam of coverage, a very narrow beam providing connectivity all the way when it lands 3 hours later in Cochin. Right, so that's where we are going, as I already mentioned. We are trying to have interoperability with the 5G standards. New terminals are coming wherein you could have the connectivity into such a small terminal directly from the satellite.

Just to conclude, to cover the media topic of the session. So we, as Intelsat, because we carry our still our majority of our business in India relies on media customers and delivering that content, so we see some evolution happening on that part. So we are looking at new services being demanded by existing broadcasters. People are trying to deliver OT services over white beam satellites. There are requirements coming in for live TV services to be delivered to commercial aircraft as well as maritime ships. Because the throughput is increasing, we are able to provide a better return traffic connectivity, meaning you could



have satellite coverage for any kind of a contribution link when you're, when you're, let's say covering new, smaller regional events and sports. So we launched last year what we call as Intelsat 1 IP, which is a unified hybrid network considering our geostationary satellites, our Leo partners, and in future, the MEO constellation will launch on top of that, the terrestrial fiber optic network that we have been building for the last couple of years. So for a customer, for a broadcaster, so Intelsat becomes like a single one-stop shop wherein you don't need to go out if you want to deliver the content over the IP network to a very specific region and still rely on the geostationary satellites for a wider delivery of content. Thank you.

Mr. Gurvinder Chohan: Fine, good afternoon everybody. it's an excellent panel, and I thank you, my colleagues, for setting the stage. I think they have stolen my thunder lines, so I'm not sure what I have left to say because when I start with Mr. Sanjeev, he covered almost all the spectrum where we started the journey, and then Mr. Gill, he covered all the spectrum where it's going. So I'm left in between, so let's see what I can cover. So as, Mr. Christopher said, my name is Gurvinder Chohan. I am the CEO for QSC, and QSC stands for Quantum Scientific Technology. I'm lucky enough to be part of a journey of evaluation where the satellite or satcom or space industry started. I started my career about two and a half decades ago with a company named Spar Aerospace, and that company was the very first company to provide the RF payload for the very first satellite named ALO in the 1950s. So I've been lucky enough to see those components which were the baseline for the human RF and telecommunication technology that you see today. I have seen those resistors and capacitors which went up to space, the same copy of those. Continuing on that journey, I was a part of those. Worked early '90s for the development of Ka-band when the industry was so much against Ka-band. They said, "No, Ka-band will not work due to rain attenuation, weather, cloud," and now everybody's running after Ka-band. And the same thing I'm hearing about optical communication, FSO, that it's a weather model, this and that, and we are running successfully, the weather, the optical communication as well. So, I'm getting to my perspective where we started, where we are going. So I'm going to take you back where Mr. Sanjeev Gupta left that ISRO today is providing 25 gigabytes of throughput. So I'm just keeping it in mind. I'm taking one step further from there, and this is just a little bit of introduction. I'm not going to waste my time on this because this is a typical corporate strategy. I don't want to say blah, blah, blah. We are the best, but we do something. You will see what we do.

So we have a full array of buses, like we have our own buses, smart buses, what we call. And, if you compare or do the comparison between the industry standards, the 120, 100 gigabytes throughput satellite bus will be. We can launch in the 1.5-ton class using electric propulsion system. And, the same thing we are providing very, very high throughput. And we are also working on very optical communication FSO, free space optics, and which is a hybrid model. Means, one uplink will be in optical and downlink will be RF. And then we are using the fiber optics on the terrestrial network. Reason being, because right now we people



don't have much optical receiver available right now. Plus, the cost of an optical receiver is very high. And now even we have started to migrate on the QV, and we have a demo, a proof of concept next year for E-band. That will be the next frontier. And as, as we say, yeah, last week, I think MRIL was there. We had another DEP-S, and, our Chief of Defense Staff, he said space is a final frontier. So I think we have to look into that perspective that we have to go into space, look into the space that's finding the solutions for us, what we do today with that. Sorry. So I'm going to give you some flavor what we are doing. These are the one of the few satellites that we are right now manufacturing for one of the customers, FS2. So here we have 64, 65 plus beams, which covers all of, Africa as well as, India. So we have a few beams over India, and this is providing about 120 gigabytes throughput. And this is a dual Ka and QV. So we have gateways in Ka and uplink on Q and V. Another flavor is this one. There's a 97 gigabytes throughput. The same thing, we have hundreds of beams. That's another flavor in K band, 35 gigabytes. This is our smallest one. That's a KU band, 95 gigabytes throughput satellite, covering the whole of Southeast Asia, starting from Singapore all the way to Indonesia. And that's a C and K gateways.

So now I'm coming back to what Mr. Gill just briefly touched about, the SDRs and OBP. So we have been working on OBBs, onboard processors, and this is one of the unique technologies where we are gearing up to provide own-board processing up to 1 terabyte. So you have a slice of 100 gigabytes. You can keep on adding and provide more power to the satellites. What it does, it does all the channelization, beamforming, regenerative, stacking. And then we have modern features like you can do the interference mitigation, payload optimization. And then you can have fully software-defined. What does it mean? There was one argument last week. Somebody made, "Oh, Leo is the future because if I spend hundreds of million dollars on a Geo satellite, and by 15, because Geo is typically 15 to 20 years. So by the time I reach 10 years, the Leo satellite will be more advanced than me." So my counter-comment was, "No, that's not true because now we have a softwaredefined radio. You can upgrade your payload every five years. So you can have a more advanced throughput, more consistent throughput than the Leos." People don't realize this technology, where we are heading toward, and then they start arguing. So that's what we are saying. This is where technology is going, where this is where the industry is going, that we are looking into the future where we have more flexibility, more options on board, where we can do anything. You have more traffic in Mumbai in the daytime. You shift your beam over Mumbai. In the evening, you have more demand in, let's say, northeast. You shift your demand on northeast beams. So now you have so much power and so much flexibility that you don't need to do on top of it. Everything is done automatically from the ground control stations. You have schedulers. Now they do automatically the payload optimization, beamforming, beam switching. Everything done automatically. You don't need to do anything. So that's the veracity is there now, and that's what we are looking for the broadcaster to come in the picture to talk to us so that we can find a more solution.

So this is our smaller solution. I just wanted to give you a flavor of what we do. And you can







## **SESSION-6**

WRC-23: Impact on Indian Regulatory Framework

SESSION CHAIR

**Sanjiv Shankar, IRS** Joint Secretary (Broadcasting), Ministry of Information and Broadcasting



Sanjiv Shankar is an officer of the 1993 Batch of the Indian Revenue Service, presently serving as the Joint Secretary (Broadcasting), in the Ministry of Information & Broadcasting. As JS (Broadcasting), he also looks after the Policy and Regulation matters of the broadcasting Sector. His education includes a Master's in International Development Policy focused in Public Policy and Taxation from Stanford School of Public Policy, Duke University, USA.

**M.K. Patnaik** Senior Deputy Wireless Advisor, WPC, Gol

Murayama Kumar Pattanaik currently works as Sr. DWA, Wireless Planning and Coordination Wing (WPC), in the Department of, Telecommunication, Government of India. He is the Vice Chair of ITU-R Study Group 3 and holds the Co-Chairs position of the Working Party 4 (WRC-23 Satellite Issues) of Asia Pacific Conference Preparatory Group (APG-23) Mr. Pattanaik is a graduate in Electronics and Telecommunication Engineering from University College of Engineering, Burla, in the State of Odisha and also holds a Post-Graduate Diploma on Spectrum Management from Management Development Institute, Gurugram, India.





**Bharat B. Bhatia** President, ITU-APT Foundation of India (IAFI)

Bharat B Bhatia is the President and CEO of the ITU-APT Foundation of India (IAFI) and Vice Chairman and head of Asia Pacific for the World Wireless Research Forum (WWRF). He also chairs the ITU group on Private 5G as well as the APT group on Radio Local area networks. Mr. Bhatia has over 49 years of experience in telecom and information technology. Mr. Bhatia hold a BE degree from University of Delhi and is a fellow member of IETE, the Institution of Electronics & Telecommunications Engineers. He did his Foundational Course from Lal Bahadur Shastri National Academy of Administration in 1976 and has completed several management courses from various institutes and universities including National University of Singapore and George Washington University, USA.



Mr. H. Rayappa Director, Satcom, ISRO HQ

Mr. Hanumantha Rayappa, a senior scientist in ISRO. He currently is working as Director, SATCOM Programme Office at ISRO HQ, Bengaluru. He is dealing with frequency management, satcom applications, ground segment, capacity management and satcom planning. His contribution is significant in the planning & realization of Gateways for High Throughput Satellites. He has been a key player in rollout and operations of SatCom networks for societal applications, like Telemedicine, Tele-education, VAST connectivity, Disaster Management, Search & Rescue, etc, which have a greater social relevance. He has contributed for proliferation of NavIC and GAGAN solutions into various applications. He has played an important role in formulating the new policy and guidelines in the Satcom area. He is a recipient of two Team Excellence Awards of ISRO and IETE – R S Khandpur Gold Medal for tele-education & tele-medicine applications.





Jitendra Singh Director, Qualcomm

Mr. Jitendra Singh is heading the Regulatory and Government Affairs team and has been working with Qualcomm since 2009. His responsibilities include interfacing with regulatory and policy making agencies in the region on behalf of Qualcomm. Jitendra has more than 35 years of experience in the field of communications management. Prior to his appointment at Qualcomm he served in the government for more than two decades. Mr. Pattanaik is a graduate in Electronics and Telecommunication Engineering from University College of Engineering, Burla, in the State of Odisha and also holds a Post-Graduate Diploma on Spectrum Management from Management Development Institute, Gurugram, India.



### WRC-23: Impact on Indian Regulatory Framework

#### SESSION CHAIR

**Mr. Sanjiv Shankar:** Let me welcome my co-panelists. I believe we have a very eminent panel from diverse backgrounds and they are all domain experts. So, I hope to get a very macro as well as a micro view of the subject that we are going to discuss today. And, the subject which is given to this panel is the impact on Indian regulatory framework of WRC 23, the World Radio Congress which happened in November-December at Dubai in last year.

So what I propose to do, gentlemen, is that I will give a macro policy view of the subject and the issues which I thought should be relevant on this subject. And then I will expect each of you to come with the domain inputs on those. And then may I request Mr. Bhatia at the end of the program to collate and give a concluding remark so that we can summarize what we have discussed and determine the outcomes of this session. So if that is okay with everyone, I'd like to proceed.

So good afternoon, ladies and gentlemen. To begin with, the first thing that I want to mention is that spectrum is a public resource. And, therefore, there are national and international regulations. Any public resource has to be used optimally. And any regulation, whether it is national regulation or international regulation, has to take into account certain basic principles of public policy. So, the first policy, the first principle should be whether it is optimally utilized or not. That is the first principle because it's a public good, and it should be used for public welfare.

Also, another point that I would like to mention as a basic principle is that, because it is a public good, the exploitation for public good as well as for any other purpose should provide equal opportunities to all. So, there should be a level playing field for everyone. It should be technology-agnostic. It should not favor one technology over the other so that there is equal opportunity for all kinds of technology to grow in that field. And there should not be any entry barrier for the businesses. So, for example, one business or the other business, if they — it is possible sometimes there are genuine business barriers, like some industries are very high capital-intensive, some are not so very high capital-intensive. So, it should not be an artificial entry barrier.

So, when I was reflecting today on this topic, I thought about the issues we are trying to address. In the ministry, we deal with spectrum allocation, primarily handled by DOT. However, once it is assigned to broadcasting services, the Ministry of Information and



Broadcasting also uses spectrum for various purposes. When I'm talking, I'm specifically referring to broadcastings and broadcasting services. Ministry of Information Broadcasting also uses spectrum for various purposes. I'm focusing solely on broadcasting and its interface with telecom services currently. Going forward, we are in a convergence mode of providing services, offering opportunities for convergence for both broadcasting and telecom services. This is the scope of my categorization upfront. And some of the issues that I tried to figure out, I'll just read for my co-panelists to take note of, and see if we are able to answer these questions in this session.

The first issue I make out is the current spectrum allocation for broadcasting conducive to the growth of emerging technologies. Broadcasting has been defined as one-to-many. Now, there are developments where, due to convergence and what we've categorized in our new broadcasting bill, we're also treating internet-based broadcasting as such. There are some issues on that. But just to make things simple, there are different emerging technologies. Can we say that all of this can be covered in broadcasting? At the same time, does the current spectrum allocation do justice to these emerging technologies?

Then, the second aspect which I thought would be relevant, is that there is a clamor for more spectrum because spectrum is scarce, and, already, we have legacy technology still in practice in the broadcasting sector. So, there is an increasing demand that the legacy services in broadcasting, which are using earlier technologies and are based on spectrum, for example, DTH is there, HITS is there. So, all these carriage services, whether we need those services anymore, and, I mean, going forward, we definitely need it at this point in time. But with emerging technology, with more and more, I mean, these services, the same kind of services being rendered through internet-based platforms. So, whether the spectrum can be used for other purposes or not.

Then, is there any way to measure the value of the public good which broadcasting adds through its free-to-air and mass outreach, providing information, entertainment, and knowledge, and bringing about positive externalities? So, there is an ongoing debate because broadcasting is one-to-many. It has the potential to reach the masses at the same time. And, the internet-based services, they are largely one-to-one, although we are seeing, for example, if Jio Cinema broadcasts IPL, then, it is like at the same time six crore people are watching it. So, whether it is one-to-one or one-to-many, that is something which is left to the interpretation because things are changing. And the way the content is being, used or being consumed by the subscribers. So, that kind of blurs the definition of one-to-many and one-to-one kind of a thing because, at the same time, the same content is being watched by a very large number of people in many of the events that we are now witnessing. So, that itself, the basic premise of the definition of one-to-many and one-to-one sign of the definition of one-to-many and one-to-one sign.



So, we have these, are the thoughts. These are the few. Then there is another debate which is, and the link to that, whether there is a measure for the value of public good because since broadcasting can reach one-to-many at the same time, it is still considered as the best way of mass outreach by the government and for public interest issues, for example, health, education, etc. So, can we quantify the value of the positive externalities that it can create in terms of rupees if we want to quantify that? So, that is another very interesting aspect to think about.

And related to that is the debate going on between administrative allocation and the auction because Mr. Christopher was here, and he mentioned that the Telecom Act of 2023 has now made possible that for many of the services, the spectrum can be allocated on an administrative basis. So, this is another very important area which I needed to flag. And what about the global competition and the strategic checkmating of countries in the world forum such as ITU and WRC for strategic considerations? So, again, a lot of these strategies are adopted by countries in international organizations. And I'm sure many of you are privy to those considerations. And as a country, we need to be aware as to where our national interest lies and what are the real motivations of neighboring countries and other countries when they take one view or the other in such international forums.

And then, last but not least, should we allow broadcasting to be overtaken by telecommunication? This is another important consideration moving forward. Again, these are things that are, moving forward, again. I hope I'm not taking too much time, but I need to highlight the subtle difference between broadcasting and telecommunication because conceptually, these are two very different things. And why I'm mentioning this is because we are going through a period of changing regulatory frameworks in both the telecom and broadcasting fields. Currently, we have the new Telecom Act, which has replaced the Indian Telegraph Act of 1885. And now, the broadcasting sector is largely governed by the Telecom Act of 2023 and the policies grandfathered by this act. Concurrently, we are also in the process of, in fact, we have put it out in the public domain for consultation, the Broadcasting Services Bill, which seeks to provide an umbrella legislation for all broadcasting services under one roof. This includes what we commonly refer to as OCCP or OTT platforms. There are some debates in the public domain which are happening. We are in the consultation phase, having received those inputs, and we are in the process of examining them. So, on the conceptual difference between broadcasting and telecommunication, I'll take two more minutes before I would like to wind up and open up for our experts.

So, conceptually, there is a difference between telecommunication and broadcasting. Any act or regulatory framework that seeks to administer or regulate under a common framework is likely to face issues. And why I say this is because there is an ongoing convergence between broadcasting and telecom sectors. The ongoing convergence between broadcasting and telecom sectors notwithstanding, there is absolutely a need to



understand this basic difference. It is also important to understand because spectrum is the basis for both broadcasting and telecom. So when we are looking for more spectrum for telecom, are we missing out anything for broadcasting? That is the limited point I'm trying to make because there are concerns among broadcasters. In India, conversations revolve around pushing the broadcasting spectrum band from 3670 MHz to 4,000 MHz and above, as it currently falls between 3670 to 4200 MHz. There is an ongoing consultation regarding whether to move it further up to 4,000 MHz and above. Then there are other issues, such as whether 476 to 698 MHz should continue to remain with broadcasting or some portion of it can be reformed for IMT use. All these issues are basic to understanding why. So, I thought it would be very relevant for us to understand this basic conceptual difference between broadcasting and telecommunication. I'll just read a couple of pages because this is what I want to convey so that there is enough understanding among all of you, including those listening on the internet.

So, what is the basic conceptual difference between telecom and broadcasting before we make more operational decisions like spectrum allocation or shifting from broadcasting to the telecom side or maybe any other move? The first difference which I would like to point out is the purpose. It is very different in spirit and purpose. This was enunciated by none other than the Supreme Court of India in the Cricket Association of Bengal case. The court makes it clear that principles governing the broadcasting sector are specific and different from those that may generally apply to the telecom sector. The court holds that airwaves must be used for advancing the public good and goes on to explain the meaning of the public good in the context of broadcasting. It states that, Now, what does this public good mean and signify in the context of the broadcasting medium? In a democracy, people govern themselves, and they cannot govern themselves properly unless they are aware of social, political, economic, and other issues confronting them. To enable them to make a proper judgment on those issues, they must have the benefit of a range of opinions on those issues. The right to receive and impart information is implicit in free speech. This plurality of opinions, views, and ideas is indispensable for enabling them to make an informed judgment on those issues, to know what is their true interest, to make them responsible citizens, to safeguard their rights, as well as the interests of society and the state.

So, the basic thing is that the right to freedom of speech and expression is inherent in broadcasting. Article 19 provides the fundamental right to freedom of speech and expression. That is what the broadcasting sector brings to society and the nation at large. What telecom brings is a one-to-one communication, with a lot of privacy and secrecy around it. There is also significant government interference, as seen in the earlier Telecom Wireless Act, which allowed the government the power to intercept signals on certain pretexts. So, these are fundamentally different. Therefore, they should not be treated similarly. Security considerations, again, are very different. The business model is also



very different. Under the broadcasting business model, the roles and allocation of work are divided between broadcasters and broadcasting network operators. In telecom, the business model has progressed to a stage where the telecommunication operator alone is in charge of all activities related to telecommunication. They own the spectrum, put up the infrastructure, and provide the user interface. There is also an ongoing debate where telecom operators are asking for revenues from content operators, such as OTTs, because they claim to have invested in infrastructure, yet all the revenue is pocketed by the content providers. Regulatory convergence is another issue arising from service and platform convergence. The Ministry is working towards achieving regulatory convergence through initiatives like the Broadcast Services Portal, which integrates with the Department of Space, Department of Telecom, and the Ministry of Home Affairs. This regulatory framework aims to streamline processes for ease of doing business. International regulations, such as those from the ITU and WRC 23, deal with these issues. WRC 23, in particular, was significant for the broadcasting sector in Region 3, where India is located. By and large, there is a status quo emanating from WRC 23, which is likely good news for the broadcasting sector at large. I'm sure my co-panelists will have more to say on these particular issues.

**Mr. MK Patnaik:** So, in the meanwhile, I initially thought that this was going to be a purely technical session. But then, given the background that sir has offered—thank you, given the background that sir has given—I think it's a much broader concept, talking about policy, economics, spectrum allocation, and pricing. So, there are a lot of issues—many issues perhaps—that WRC cannot decide, but they are important policies. And I believe that we should be able to shed some light on many of these questions, if not all of them.

So, I had made some slides for them. They may not all be relevant to the subject matter that we just heard, but let us discuss them. I want to show them one by one. So the first one, I just want to give a brief understanding about my outline, what I wanted to say today. What I initially planned, initially, I had a plan that in the first four slides, I want to tell you briefly about what WRC process is. And after that, from slides 5 to 11 or 12, I was going to talk about what decisions were taken at WRC 23 and how perhaps we could have lessons or understanding or takeaways for India. But then WRC doesn't deal with national issues, as you know. WRC deals with international issues, like international spectrum management.

International spectrum management essentially means if India is using some spectrum, whether Bangladesh can use the same spectrum or not. So, that is what international spectrum management is. And these are the issues that we will be discussing. But to set a background, I would just want to mention that sir talked about many services, particularly mobile services. However, there are 43 different kinds of services, and these services are defined in an international regulatory framework. They vary substantially in the way we use them in India or in any other country. In the national framework, for example, if you take the case of broadcasting, broadcasting is defined in the radio regulation as a



radio communication service for direct reception by the public when the public is directly receiving it.

So, an FM radio station is a broadcasting station. DTH is a broadcasting service. But when you receive something on the cable, going by the definition of RR, it's not a broadcasting service. It is something called a fixed service. This is the fundamental difference when you talk about broadcasting service, as defined in the radio regulation in the international framework of regulations, as defined in the policies—there is an essential difference. And also, there are different spectrum allocations for them. That is the fundamental point.

And sir also talked about one very interesting issue: how these things are converging. Initially, as you might be knowing, that broadcasting is perhaps the oldest commercial application of wireless—commercial application I'm talking about. So there were some fixed services, Galileo invented it sometime in the beginning of the around 1890s or so. And then the Titanic disaster happened in 1912. And then, in 1928, there was something called a fixed service in the US. This fixed service used to, then somebody had a brilliant idea. He said that why not I blast a lot of power in all directions so that everyone receives it. And then radio started.

And you'll be pleased to know that broadcasting is not a radio communication term. Broadcasting is essentially an agricultural term. When you sow the seeds, you actually throw them all around you. You don't seed them one by one. Of course, there are certain agricultural methods in which there is a way to do that also. But generally, it is understood that broadcasting means throwing the seeds at random. And that is how broadcasting started. The radio regulation adopted these words and then defined radio broadcasting as some kind of a radio communication service, which is received directly by the public. That's the very fundamental definition.

So, going with that fundamental definition, whenever I talk about broadcasting service, I will essentially mean that. And when I am talking about something like a cable TV operator operates, that I will call as something operating under a fixed satellite service. I hope that backdrop is clear. I will briefly explain what exactly WRC 23 does. It is the apex meeting, along with another meeting called the Radio Communication Assembly meeting. These are the apex meetings, and these are held almost once every four years. Each one lasts for about four weeks. The most recent one was in Dubai, held from 20th November to 15th November. The number of delegates was about 3900 from 163 countries.

But the key point to note here is that, sir also, as pointed out, this is not exactly some kind of a what I should say, obscure techno-centric event. It is where the realms of global markets and geopolitical strategies intersect. For example, if some spectrum is in demand by the satellite services, and then there is somebody is going to lose, somebody is not going



to get it. So that way, this actually determines who is going to gain predominance in the international sector, in the market, in the global market. So this is what it wants to say. And so I'll come to the next slide. And so the main objective is that what does a WRC do? WRC is already an international framework. And you are actually introducing new elements into it. This new element should sit comfortably into the existing global environment, global policy.

So, WRC determines the different technical, operational, and regulatory policies so that the new services can be accommodated into the existing policy. The preparation for WRC meetings starts around four years in advance, sometimes it starts around eight years in advance. Then the studies are carried out, something called as the members' sector members. There are academia, regional telecom organizations, and from India also, we have India as a sector member. Within it also, we have several other members. For example, academia, there is Hyderabad as an academia. Then COAI is a telecom operator representing the industry. For example, there is one ITU Foundation that is also from something called Regional Telecom Organization. So, when we set up an agenda, these studies are carried out and discussed at different working parties. And then they are finally decided at WRC whether there is a consensus or not. WRC always decides things by consensus. So this is what WRC does. The working parties of particular interest related to broadcasting are two of them. One of them is Working Party 6, and another is Working Party 4, also known as Study Group 6 and Study Group 4. Study Group 6 has three working parties. One of them, 6A, deals with terrestrial broadcasting delivery, which handles most of the spectrum-related issues. Then there is Broadcast Service Assembly and Access, and Program Production and Quality Assessment. Mr. Rajiv Prakash Rajiv Kumar, we have nominated him as the vice-chairman of one of the working parties, Study Group 6, and he will probably be nominated, and I wish him all the best in Study Group 4, Satellite Services. But I must say that I would encourage our colleagues from MI to ensure they can attend those meetings, these technical people who understand the subject, attend those meetings in an uninterrupted manner. That will help the country build up understanding and have a say in the global management of spectrum policy. Yes, sir. Right. And then, sir, Study Group 6 deals with terrestrial broadcasting services, as we know, FM broadcast, AM broadcast, and something called HF broadcast, AM broadcast, FM, medium-wave broadcast. These are the three different kinds of broadcasts used for terrestrial services. And they are being used today as well. Many terrestrial services are operational. It is not that they are dying out.

And Study Group 4 similarly deals with something called satellite-related issues. Working Party 4A deals with FSS and BSS. I talked about FSS and BSS. I made the difference between these two services very clear before I started the subject. So we come to the next slide. In my view, there were two specific outcomes which hold out certain takeaways, certain lessons for us. One of them was dealt under Agenda Item 1.5, as also mentioned



about this, 472 to 694 MHz. This was for Region 1, and they said to review this. The purpose was to determine whether the services currently using it can accommodate new services. So that was what the first Agenda Item 1.45 was discussed. The second was under Agenda Item 10. I have written somewhere 1.21. I apologize for that mistake. Interestingly, there is a new BSS allocation in the 17.3 to 17.7 GHz being considered. So these are the two important agenda items. But the second one will be for WRC 27. So these are the two.

So under 1.5, as I said, to save time, I will briefly mention what 1.5 was mandated to do. So I will not give it much time. The output in Agenda Item 1.5, this item 1.5, was always considered one of the easiest ones, which could always be completed within two weeks' time. But then, surprisingly, it did not complete until the last day of the conference. It just dragged on and on because the issue, when it comes to broadcasting versus anything, it becomes a little complicated. Many countries, we do not compare only ourselves, but many countries use broadcasting as a primary means of entertainment, education, and, most importantly, human resource development. But if I go to the next slide, perhaps the thing will become more clear. This is how international spectrum allocation looks like

So I have divided into three regions. Region 1 in green, Region 2 is in blue, and Region 3 is in red. Region 3 is where India falls. India and South Asia, Asia-Pacific region, they fall in this. But if you look at Region 1, you have got only broadcasting. You don't have anything else. Whereas in Region 2 also, broadcasting, which is written in capital, is something called the primary allocation. It means primary allocation must, I mean, has got a priority over the secondary allocation which is written in smaller, I mean, not in capital letters. But in Region 3, it comes to a very different scenario. It talks about fixed, mobile, and broadcasting, all primary services. They must share the frequency band. No one can claim priority over the other. So that is why in Region 3, the matter is a little more complex when it comes to spectrum allocation for fixed, mobile, and broadcasting. So they wanted to change that in C23, which did not happen in Region 1. It did not happen. What happened in Region 1?

In Region 1, what happened? They agreed to a secondary allocation to the mobile service. They did not agree. If you look at the previous table, there is no mobile if you look at the Region 1. So here also, they did not agree to a primary allocation to a mobile service. All was agreed was a secondary service, and a secondary service cannot claim protection and must not cause interference to a primary service. That is why that is why it was stopped. But if you analyze why this happened, one of the major forces that worked against a primary allocation to any other services is that, in Region 1 particularly, in some of the European countries, PMSE kind of application, which we call as Program Making and Special Events. This is called also Broadcast in Auxiliary Services (BAS) and Broadcasting Auxiliary Services (BAP) from Program Making (BAP). So these services normally operate.

Maybe I'll conclude it. I'll not take much time, but these services operate, and unfortunately,



these services cannot comfortably coexist with other large-scale deployment of something like IMT, for example. It cannot coexist with them, but it sits comfortably with something called the Broadcasting Service because Broadcasting Service always leaves a lot of gap and lot of white spaces, which can always be used in an opportunistic manner. And that is the reason why PMSE was accepted as a secondary service, but mobile was not accepted by them as a primary service. They said that both these things cannot coexist.

So, so this is the allocation. And I just explained it. So in 5, there was a new footnote which was added. It says that around 30 countries were identified, mostly in Africa and Europe, in which they say 470 to 694 MHz is also allocated on a secondary basis to the land mobile service, intended for application to ancillary to broadcasting and program-making station. This is the first time that such a name ever came to the radio regulation. Earlier, it was never mentioned like something like program-making and special events. It shows the growing importance of these kind of applications around the world where they are considered as important to building up the social capital in holding out events and a lot of social activities happen in this band.

And I think these are something which are also falling under the domain of the Ministry of Information Broadcasting also that way. And then H... Okay, I see. I'll complete in 2 minutes more. So the second one also is similar. Wherever there was a secondary mobile service was introduced, then there was a strict, what we call as restriction imposed on it, where it says that what are the boundary conditions that must be met for the spectrum to coexist. So I will not go into deeper analysis, but I draw your attention to point number five. And I believe that these countries, most of the countries who are in favor of PMSE, they have a strong tradition of street music, cultural show, sports, and they attach much importance to such activities. Folk music and performing arts and all other cultural events are popular medium of education, entertainment. And we are building social capital among the citizens. I think our country is also culturally very rich, and we are planning to hold so many events, and we are planning to have Olympics. We held Kabaddi, cricket, football, and hockey. So I think we have a scope. We need them.

And so a point to ponder, what are the points to ponder in this is that these are the few points that I wanted to touch upon that in India, presently, as per the policy, we have about 470 to 526 MHz, which accounts to around 56 MHz that is corresponding to seven channels that is used for terrestrial services. 526 to 582, existing TV stations will be grandfathered. Grandfathered is a term used to say that the existing operations will continue until the end, but no new operations will come up here. And then frequencies above that will be used for IMT. That was the last decision which was taken by the committee of secretaries by the government, we can say. So as per the ITU recommendation BT 2302, there is a recommendation for a single layer.



Single layer means one layer of TV transmission. It requires about 760 MHz spectrum. So we have got around 60 MHz, 56 MHz spectrum. If you want to have two layers, then we need to have 120 to 130 MHz. Two layers mean two multiplexers around the country. And if you have two multiplexers, then you need around 130 MHz of spectrum. And 130 MHz of spectrum can give you around 16 to 17 HDTV channels. So I must conclude before... I have just another one slide to show. But I would encourage all the participants, which I'm showing in red, that I would encourage you to draw your own conclusions. I will not draw conclusions, but I have given you enough thought to draw your own conclusions. This is what... And the final point is about the new agenda item which is coming up. And this was also an output of WRC-23, in which they are trying to find a new BSS allocation.

I work in WPC wing, and we see how many satellites are launched with a BSS transponder on them. I do not see a decline in them. Every three months, two months, we keep on receiving a lot of requests for BSS coordination. Not only that, this WRC took a decision to give BSS rights to 43 countries which did not have that right earlier, and they were eager to grab it with both hands. So let us not say that BSS doesn't have a demand. Satellites, I mean, this linear TV, the way some people refer to it, they have scope. They have a future. And I think... My slide will be there. You can always go through it and get back to me whenever you have any questions. With that, I conclude. Thank you so much.

**Mr. Sanjiv Shankar:** Thank you, Mr. Patnaik, for taking us through what transpired in WRC-23 in good detail. And just one query, I thought the points, the list of points that you mentioned, and in that, I just saw 472, I think, 472 to 598 is assigned to IMT. So I think that was the COS decision. So how does it go with the ITU or the current ITU regulations? Is it in line with the ITU regulations, or what is your sense on that?

**Mr. MK Patnaik:** Yes, sir. That's a very important question. And as I showed that 472 to 698 MHz, the entire band is allocated to mobile, fixed, and fixed-mobile, and broadcasting on an equal primary basis for Region 3. I showed that in one of my tables. So when ITU makes that global level allocation, it is for each country to decide how much they want to devote to what service. So in case our country wants to devote a certain part of the total range to one particular service and a certain part to another particular service, it will be an internal discussion. So we are very much online with the international regulation. Thank you

**Mr. Bharat B. Bhatia:** Thank you to BES for giving me this opportunity to present my thoughts on this very important issue of broadcast spectrum and share the learnings from the World Radio Conference, which we attended in Dubai in November-December. Many of us here actually spent one and a half months in Dubai, and many of those were all nighters that means we started at 8 'o' we clocked in in the morning and continued working until 4 am. then, we started again at 8 am the next day. It was very intense meeting, the decisions



made in these conferences are very very crucial, billions of dollars worth of investments are made based on the decisions of these conferences.

I'll quickly run through some slides quickly, focusing more on the important points raised by the chair of this session, Shankar sir. And I would like to start first of taking that point that spectrum is a public good, and I think that is the crux of the whole issue. Spectrum has to be used in the most economical way that benefits public around. So thats the whole purview of whole spectrum allocation policy we have. Now I will talk about this ITU World Radio Conferences. The reason we have this very elaborate process of world radio conferences is exactly because of that because these are the conferences that allocate spectrum to different countries, to different services, to different usages. and it goes through a very elaborate four-year long process before any change can be made to regulations.

The conferences are legally binding treaties involving all 194 countries, including India, and any change in regulations must go through a meticulous process. All of these countries have signed on that any change to this has to go through this very elaborate process which starts at the end of the conference. For example, for this one our conferences ended on 16th December and on 18th December we sat down preparing for the next conference which will happen in 2027. So, see the elaborate thinking that goes into making any single change into the radio regulations. Its a very sacrosanct document. Most of us who are dealing with radio engineering are previe to the document, we call it the red books and they lay down exactly what frequencies can be used. As Patnaikji very clearly brought out the broadcasting service and I am talking about the UFH Band from 470 to 698, it used to be 470 to 960 actually. But over a period of time more and more spectrum has moved into the the mobile services. But today we are talking about 470 to 698 MHz. Asia which is our region which we call Region-3 has already changed all of that band into shared band. That has not happened in Americas, and that hasnt happened in Europe. The reason being that in those countries the terrestrial broadcasting is all pervasive. In India, actually and I am sorry to say this that this very valuable band has been lying vacant for the last many years. And if we were to calculate the value of the spectrum it will be humongous. Nobody will be able to justify talking about this why we have not used the spectrum which was meant for mobile services, broadcasting services for all these years. But now that atleast we have started using part for mobile services and we are at the verge of using it for broadcasting services. I think we need to move forward.

Now again if you look at the process that goes through this is not. There is a long process but the people who are involved in this process are very complex. If you look at those six agencies that are on on this diagram. Each group of countries in Asia Pacific, we call APT Asia Pacific teleommunity or in America it's called CTel or in Russia it's called RCC. A group of countries get together and then first decide what is good for their countries and that is then fed into the WRC process. Then only these regulations come out so just reemphasizing



that it's a very very long drawn and very complex process that everybody goes through.

Now, this is the conference that was held in Dubai. If you can look there was this the king of UAE and the lower picture tells you the number of people that represent 5,000 people who spent two months in Dubai, day and night to come to this conference. This included: 4500 participants 22% woman participants, six languages English French Arabic Chinese Spanish. This tells you the complexity of the work that is done in these conferences.

And each of these conference has a huge genda item. So broadcasting is just one as was mentioned by Patnaik Ji. There are large number of 43 services each of them gets their own say in these conferences and for each there is a separate agenda item. Now if I look at this 19 specific agenda items, the agenda item 1.5 was only agenda item which was dealing with the terrestrial broadcasting and that to only with the region 1 which is Europe Middle East and Africa. There was no agenda for broadcasting in this because in Asia Pacific we already decided long back that these bands would be shared but Europe has still not decided and there's a lot of pressure on Europe to open up these bands for mobile services and shared services.

Now, there's so much focus on the mobile bands because if you see everybody has a mobile in his hands everybody whether it's for broadcasting, I spend half of my time watching videos on this not me but I'm talking general public everywhere you go. So, broadcasting is on the handset that's why we need more and more Spectrum for the mobile services. And if you see here and over the years through the world radio conferences I'm talking about from 92 onward so much spectrum has now gone to mobile services and more and more spectrum is going in every conference.

I'm not going into details but you can see see that band starting in the UHF 600 to 960 then the middle way the 2 GHZ Band then 3 GHz band then 4 GHz 6 GHz 26 all along there is a huge amount of spectrum that has been given over the number of years for mobile services and the reason is obvious because it is needed everybody needs it and every country makes money also by selling the Spectrum but at the same time provides very good amount of Public Service.

Now, I come to agenda item 1.5. I think Patnaikji explained about it. The main issue of this agenda item was whether in region one we can open part 470 to 694 or 960 for mobile services. It's broadcasting primary, but whether it can be opened up for mobile services. This was one of the most complex agenda items because broadcasting in Europe, particularly in Europe—I'm not talking about the Middle East and Africa because those countries have already moved onto mobile services—but in Europe, it is still primarily broadcasting, and most people get their TV service in these bands. 470 to 694 is the key band for the Broadcasting Service in Europe. That's why after all the deliberations and all-



night sittings, no decision was made. Primarily, it remains broadcasting until 2030. That means for the next 8 years, nothing will change; it will still continue broadcasting. But a way forward has been found that in some countries, particularly in the African region and the Middle East region, they opened up for mobile services, but not in mainland Europe except one or two countries. And through various footnotes, and there also, there's a lot of coordination mechanism has been built up.

One new development that has occurred is the PMSE, as Mr. Patnaikji explained. This is part of the Broadcasting Service but has never been considered as a part of Broadcasting Service. However, it is huge and important. Every cricket match, every political rally, whether it's a Congress party rally or a BJP rally, everywhere the microphones that are used utilize this part of the spectrum, and they require a significant amount of spectrum. For instance, the Olympics require almost the entire band. Planning for events like the Munich Olympics and German Olympics starts well in advance, and they are struggling to find the spectrum they need just to cover those games. PMSE has become very important; it's a part of broadcasting. It's a part of broadcasting. I don't know whether it comes under WPC or under the broadcasting Ministry, but it still claims that it needs a large chunk of spectrum in this band.

There are other parts of the spectrum now, as Patnaikji also talked about. The broadcasting satellite part of it, because it's not only the terrestrial, there's also a lot of satellite spectrum. Both in the SE band, there are a lot of downlinks in the SE band, and in the 4 GHzs, all of that band is slowly, slowly going towards mobile. It has happened, it has started happening, it will continue to happen around the world. It is happening that the C band, both lower and upper, we fought a lot—I'm sure Mr. Rayappa will talk about it—we fought a lot during WRC, but the decision was that the C band has to move to mobile services. It is not only disturbing broadcasting, it is also disrupting aviation services. You would have seen a lot of discussion going on about this. So, these are the kinds of bands that will actually impact both broadcasting services and civilization services, but the writing is on the wall: these bands will move to mobile services.

In this particular case, we were able to block 6425 to 7125 going to mobile services in Region-3. Actually, India took the lead in blocking that. India was most vociferous, and we had a lot of fights with China on that. Mr. Jitender was there, Mr. Rayappa was there, Mr. Patnaik was there. We had sleepless nights over how to stop this, and the only thing we were able to achieve is push that decision to 2027, but this band is going to move away slowly and slowly it is going to go away towards mobile services.

This is a new technology that happen so I will skip this it doesn't impacts broadcasting to some extent except for the fact that when you have the direct to mobile broadcasting this will be a very good way to reach out to unconnected areas. So you can put an IMT based



station on a high platform and it can cover lot of villages rural areas where it is impossible to put the local broadcasting station so HAPS has become a very big opportunity even for broadcasting and that's why I thought I will just add this here.

Then, there is a lot of work happening on the 6G side. 6G is of national importance for India. India's Prime Minister has declared it as a mission, and there's a Bharat 6G Alliance. The spectrum for 6G has to be found. So, they have already considered these three bands where studies will be conducted over the next four years, and this allocation will happen in 2027. However, these bands are also very important for mobile services. But then they will also be used for 6G as a major component of connected broadcasting services, as we talked about earlier. The convergence of 5G and 6G delivery of broadcasting is one of the major applications, and that's why these additional bands will be needed. Studies are being conducted as we speak now over the next four years.

Satellites, once again. HAPS is one aspect, but there are also significant requirements for satellite connectivity, which will also play a role in broadcasting. However, most of it is for providing connectivity over aircraft, ships, or trains. So, broadcasting to mobile moving platforms is one of the major areas of ubiquitous connectivity.

I think I will stop here. I just wanted to just highlight some of the key issues. Thankyou very much.

**Mr. HE Rayappa:** At the outset I am thankful to organizers particularly the president BES and Mr KK Rao for giving me an opportunity to share a few thoughts on this forum. And secondly, I think I have very little to say here. One is I was fortunate enough to participate in the WRC and witness some of the deliberations which is going on. The factors and the strategies which influence in bringing new services and also bringing new technologies where it goes of a kind the impact of the forces from existing services and the technologies who wants to try and wants to roll out as a new services and economics consideration of these changes. Because the as chair of the session said spectr is scarce and it has to be used very optimally. Those are the fundamental considerations which is already been expressed by two eminent experts in this field.

So I'll just quickly go through. I have a few slides; maybe it may look like repetition because the subject is the same. We all have worked independently, and when we come to the forum, we have to make certain adjustments; that's how it happens in WRC. So I'll try to touch upon a few things from a different perspective. Maybe I'll conclude within less than the time given to me. Already, we are crossing the allotted time.

On is the WRC process, which has been explained previously. The interval between one WRC and another is approximately four years. The process involves various regional



groups, study groups, and conference preparatory meetings, which determine what is to be studied and how it is to be approached. When it comes to the WRC, it is not a forum where you delve into fundamental issues that have already been finalized. Instead, the WRC must assess among given choices what is best suited for the countries and regions. This process is very interesting. Ultimately, the outcome emerges as radio regulations, an international treaty that is reached through consensus. Although these regulations are binding on all countries, they provide a significant degree of freedom for countries within the framework to create internal regulations and plans for spectrum management. This flexibility is crucial because countries vary in size, requirements, and population. For instance, the spectrum needs of India to meet the demands of its population are different from those of smaller countries like Bhutan or Nepal, where a smaller chunk of spectrum may suffice. However, when making international regulations, all countries and members are treated equally. Any prepared agenda brought to the WRC is given due consideration and thoroughly discussed, leading to decisions being made through a robust process."

Mainly, the WRC, World Radio Conferences, address satellite communication services, terrestrial communication services, and remote sensing. Some aspects, such as remote sensing, are not directly related to communication but are used for observing Earth's signatures from other planets. Navigation services are also addressed, and there are regulatory mechanisms in place for these, as previously discussed.

Here, I'd like to provide a different perspective. One of the bands, 1.2, encompasses five different bands, including the band 64252 7025 in the C-band, which is discussed extensively. A large number of people participated in discussions around this band, and there were debates until the last minute. However, in Region 1, which includes Africa and Europe, there was success in identifying this band for mobile services. In contrast, for Region 3, which includes India and Asia Pacific countries, as Bhatiaji mentioned, the decision was postponed to the next WRC. This delay allows existing services in this band to continue for another four years

Again, coming to another topic, the HIBS is another service which is used in the 2.5 GHz band. This is the HAPS, serving as an airborne base station positioned in the sky at an altitude of about 20 km. Similar to the earlier Google Loon program, where balloons were utilized to carry repeaters and cover a geographical region, this concept involves deploying a floating body that remains stable in the mid-air at an altitude of about 20 km. This serves as a base station for mobile devices to communicate. Initially, we had some reservations and opposed this concept. However, it was ultimately agreed upon, pushed by Japan. We have agreed to coexist, and they have committed to operating this without causing interference to existing services. Under these conditions, there are restrictions on power levels, and in case of interference, they agree to remove it. Additionally, they have committed to avoiding any out-of-band services. These conditions are part of the


#### regulations.

Again, coming to another important topic is the astation in motion Ku-band, particularly in the Indian context. The Ku-band, ranging from 12.75 to 13.25 GHz, is utilized by both broadcasters and the FSS for VSAT communication services. In this WRC, there were discussions about introducing AR stations, which facilitate communications on moving platforms such as in the air, on land, or on the ocean. The main concern discussed was how to control interference, as a moving platform could potentially disrupt existing services, whether it be video broadcasts or VSAT services. To address this concern, there was a commitment to establish a Network Control and Monitoring Center (NCMC). With certain regulatory constraints, AR stations have been permitted.

Similarly, in agenda item 1.16, the discussion revolved around EIMS in NGSO platforms, specifically Leo satellites operating in the Ka-band with approximately 2 GHz of bandwidth. Similar regulations have been imposed, allowing for the provision of communications via moving platforms. In the coming days, we may witness moving platforms providing communications in various areas such as the ocean, air, or even land

Another important thing is the intersatellite link. For example, this comes to mainly because now we see about many Leo and MEO systems they need to, in order to provide connectivity at a wider geographical area, they need to establish multiple Gateways. For example, if they use the concept of intersatellite Communications, the satellites in the Leo and MEO orbits they can directly communicate to the GEOs and so from GEO satellites because of the advantages.

The wider coverage, fewer gateways would suffice so that in order to enable this, this was the agenda item, this was discussed again it was agreed that finally the intersatellite communication can be permitted above the 350 km Heights and the direction of transmission whatever Earth to space and space to Earth on the same definitions are retained for Leo systems to GEO system and GEO system to Leo system again with certain restrictions this has been allowed.

Coming to in the broadcasting, sorry, this is again for space science 14.8 to 15.35 this is to be identified it as for the space research so finally it has been agreed only for the near-Earth space not for the deep space and this band is also identified for study for IMT again IMT there was a lot of demand every band they wanted to identify study for IMT this band is again considered for study.

Of course, Leo we have been seeing that most of the Leo systems are coming into operations because the early always the early entrance have all the freedom to put the system and operate but when in order to create a platform or facilitate more entry more number of



players into the field it needs to be regulated as part of these regulations mainly there were important considerations here one of them was the orbital tolerances for example if a constellation is operating at altitude say altitude of 600 altitude orbital part how much up and how much below they can occupy whether 10 km or 15 km or 100 km or 200 km that is known as the orbit tolerance this was one of the agenda items it was agreed upon with certain values up to 2,000 km they can operate up to these are the initial values as a tolerance of 70 km above 20 km so they can be 5 to 10% of the altitude of the orbit similarly the constellation again for example you give the recognition or notification for a constellation operating it a 1000 satellites for various operational or technical reasons if the number of satellites come to 600 then the regulation demands whether to call it as a constellation of 1000 satellites or 600 satellites then again this is again this constellation size there was a regulation that was arrived at based on a formula-based approach.

These are some of the important deliberations which happened again. The ajso systems wanted there is something called as a limitation on the EPFD. There is a limitation on the amount of power that can be emitted from the Leo systems. Again, the Leo countries which are proposing this wanted to alter this, but there was opposition globally for many reasons. This is not altered, but studies are allowed in the next WRC cycle.

These are the important agenda items which deal with the satellite part of it. Christopher G already highlighted this. The next four cycles are mainly focused on the satellite services. So, in summary, WRC 23 Indian broadcast sector is not impacted at present. WRC 23 has not impacted much, but there is growing global pressure for identifying the C-band for IMT so that everywhere the C-band, which is being used for broadcast, mainly the C-band coverage, is wide.

Otherwise, you can migrate to Ku-band or higher bands. As we move up in the higher bands, the coverage limitation comes. But it is also an idea for the same reason IMT wants to use these bands. So, there is a lot of pressure, and Ku and K-band are being exploited by HTS satellites and NGSO satellites, including now EIMS are coming into this band. BSS has the potential to address the broadcast industry, but in India, BSS band is used considerably less. Probably, that is the one thing which can be considered. Indian space policy enables it, but the only thing required is whichever satellite is to be used for BESS band, that satellite requires authorization from In Space as per the new space policy

Coming to WRC, just a few important points again: at 17.3 to 27.8 GHz, it is proposed to identify it for BSS so that more BSS band will come into that. The satellite broadcasting will have more spectrum and the new studies of the direct-to-device in the frequency band, this is the terrestrial band 694 to 698.2 MHz. In that band, up to 2.7 GHz, this is again a director device so that Leo satellites will be able to provide connected directly to the mobile phones. Another important thing is again higher bands, 70 GHz and 80 GHz



bands are being considered for FSS and BSS bands. So, the only thing while embracing new bands is it requires a lot of new technological ecosystem to be created. And these are all the important things, I think, for the time being. That's all from my side. Thank you,

**Mr. Sanjiv Shankar:** Thank you, Mr. Rayappa. I just have one query; maybe many of us may be interested: How far is India from Leo-based internet services?

Mr. Rayappa: Sir, as far as Leo is concerned, we are working. ISRO is working on some of the proof of concepts and technology developments. But while deploying it as a constellation, because by nature of the system, at lower altitudes satellites go at very high velocity. If you put a satellite at an altitude of 600 km, within 90 minutes it makes one revolution. Suppose if you put a net of satellites within 90 minutes, everyone with respect to the relative positions, they make a revolution around. So, there is no concept of fixed year. In order to provide continuous visibility, there has to be a net of satellites. That means you need, if it is at higher altitudes, a few hundreds of satellites. If it is at lower altitudes, a few thousands of satellites. Then, if you put so many satellites, then you need so much of ground infrastructure. Then, if you make a constellation, then it cannot be. IT services cannot be oriented to one country like India. It has to be addressing global markets. Then, it is more of an economic consideration rather than a technological consideration. So, for technology per se, we are working on that. We will undertake some demonstration technology. When it comes to a service rollout, perhaps it has to come from our industrial side. We can, from the Department of Space side, definitely enable whatever is either from the regulatory side or from the technology side or facility side. We can definitely do that. But it's more of a business consideration. Suppose if it is any strategic requirement, safety requirements, a customized Leo constellation can be established. But this, it is too early to comment on anything on that plus or minus.

**Mr. Jitendra Singh:** Thank you, sir. Good evening to all. First, I would like to thank BES for inviting me here. Special thanks to Mr. Rajiv for pushing me to come here. So, thanks for that. Being the last speaker helps a lot because everything has already been spoken about. So, it is easy to skip through slides and only focus on those slides which have not been shown. I will try to do exactly the same.

But getting into this particular discussion, I would like to say that spectrum is not a plain thing. Firstly, because we cannot see it, of course. But there are two aspects to spectrum. One is the technical aspect, which is that spectrum is something that can survive when out of three parameters—space, time, and frequency—if at least one of them is frozen, then only you can actually use it without interference. And that is the place where WRC actually comes into play. The entire 4E cycle work, which was explained by Rayappa sir and Mr. Bhatia, that entire work for four years is to ensure that out of these three parameters, at least we are freezing one to ensure that there's no interference when you are using that



spectrum.

The other aspect of spectrum is that when we talk about it as a public good, who will decide what is a public good? Maybe the government of a particular country will decide what is good for its public with respect to a particular spectrum. So, that becomes a public good for that particular country, for that government. But different governments across the globe will have different views, different ideas of public good. So, how do we actually make it a common public good? That is again a work which is being done in WRC.

To achieve that goal, there are three parameters here which ensure that it is decided what is public good. In WRC, technology, economics of that spectrum, and the political aspect. Technology-wise, there are countries leading in technology—for example, the US or China. These are countries where you have mobile technologies, and they are the ones who are global leaders in developing those technologies. Maybe if I talk of satellite, India is also one of those technology leaders.

So, there are different leaders in technology who will decide what kind of spectrum is to be used for what purpose. So, that becomes one of the ways of looking at public good. The other aspect is about the economics of that spectrum. I'll give an example from WRC 23. The satellite community was trying to push to have satellite phones coming to mobile devices, but they were not able to succeed because they were not getting the market access or they were not able to compete with the mobile technology. So, what they did, and now that has become one of the agenda items, 1.13 of WRC 23, is that they pushed for using the same spectrum band which is being used for mobile communication in normal standard mobile phones to connect with those mobile phones, to capture that market. So, that is how economics also plays, and that becomes an important spectrum for them. Whether it is a satellite spectrum or not, they want to study that and want to come out with some kind of solution.

The third part is that spectrum is a political thing. It is actually a seriously political thing. I'll give an example. There was one agenda item, 1.1 in WRC 23, and this agenda item was dealing with a particular frequency band, 4800 to 4990 MHz. This was about using this spectrum for IMT. There were basically two groups of countries looking for it. One of them was looking for opening it for IMT, and the other was trying to block it. The countries trying to open it were China, Russia, and similar countries. The countries opposing it or trying to block it were the US and all NATO countries.

Why? Because NATO countries have their defense equipment working on this, so they ensured that this band is not available for opening up for IMT. So, this agenda item has been running since 2015 onwards. Since then, we were fighting for this, and this got blocked because of the same reason that NATO countries do not want to open this spectrum. So,



these three angles actually decide how spectrum becomes a public good or not. Typically, it is a big boys' game in WRC, and I'm happy to actually share this with you that India is part of that big boys' lobby now, and we proved it in WRC 23 during the Dubai meeting. So, we were actually successful in driving certain points which were very political, which were very technology-related issues and had economic impact.

So, as everyone spoke about WRC, so this deals with radio regulations review of that. Regulations in four cycles, and so basically, the aim is to get the consensus. If you don't get consensus, you have to ensure that you get consensus, and there are different means and methods of doing that. Once you start participating in these kinds of activities, you will understand what it means. So, the aim is to create a stable and predictable regulatory environment needed for future investment because that is a place where billions of dollars, as Mr. Bhatia said, are going to get pushed into any of those fields for which agenda item was there. And the aim is to ensure rational and equitable and efficient economical use of spectrum and the satellite orbit resources. So, this is an important aspect. So, this is something which you probably did not see in any other presentations, so I'm showing you here. So, this was mostly the Indian delegation which participated in the meeting. Of course, this was something which we are proud of the work which we did there.

Overall, if I see the number of participants, different countries had varying numbers of representatives. For instance, China had 211 participants from the government, and this is only government or administrative delegates. The US had 163, while the EU had 140. From India, we had 62 members, but they were split over a number of conferences. So, we did not have a consistent number of members who were continuously present; others were coming and going. We had different HoD's during those four weeks, starting with the Telecom Secretary, then the Wireless Adviser, followed by the Member of Technology, and finally, the Member of Finance from the DoT.

So after the outcome of this WRC, the conference summary of the work was prepared, which is known as the final acts. These final acts are the actual outcome of the conference. In the final closing ceremony, all member states go on stage and sign them. In this conference, it was signed by 151 members. After a review of these final acts and once they are converted into six different languages, the radio regulations will be published by the end of this year, 2024. Then, those red books will be available, which will be translated into national frequency allocation plans once we get those finalized versions. As mentioned, regions 1, 2, and 3 are basically to ensure that there's no harmful interference across countries. So, any spectrum usage you are doing within your country and it is not causing any interference in the neighboring country, you can go ahead with it. For example, Wi-Fi usage. If you're using Wi-Fi, you need not go to the WRC or ITU to harmonize that spectrum; you can do it within your country because it won't cause any interference to your neighboring country. However, if you're using it for broadcasting, mobile communication, IMT, or satellite, then



you need to coordinate it because it will cause interference in neighboring countries if you don't. All these harmonization activities help in ensuring interoperability, international roaming, and ensuring affordable devices and economies of scale. Plus, it also ensures that emergency communications are harmonized across the globe. You need not have different kinds of communication systems using different frequencies across different countries or regions during emergency or disaster management situations.

I will not go into details of this but this is basically showing the how a footnote is there in radio regulation how allocation is being shown what is identification how it is shown so all all these information is available in the slides which probably will be available with the organizers here so maybe you can refer to or you can always approach us on this.

So some of the key decisions which were made were I'm only focusing on IMT and because of because of the reason that some of these bands were also under broadcasting so F band for example was the key discussion on for broadcasting as well as far as IMT but that was for region one which is Europe and Africa. Then there was 3.5 GHz band again this was for region one and region two they wanted to identify this for IMT in Region 2. Then 4.8 to 4.9 GHz which I was mentioning about agenda item 1.1 which did not actually, if I put in simple terms, it failed to achieve a consensus on having IMT here. Then upper 6 GHz band which is 6425 to 7125 GHz and finally 10 G to 10.5 GHz. So these were the few bands which were discussed for IMT point of view.

I will, again, because it is broadcasting, so I'm focusing only on the broadcasting part, that is 1.5. So the basic aim was to see whether we, in WRC23, can have mobile also as a coprimary service. It was not IMT; it was mobile. So, therefore, there was a big fight whether, since the resolution 235 of WRC15 actually said that we need to find out the spectrum for IMT, but IMT is a subset of mobile, so it was only talking about mobile and not about IMT. So this was a big question mark and this was discussed over four years.

The background to this was that during WRC 2007, some portion—I'm talking of region one only—some portion of the band was identified from the entire range from 470 to 960 MHz. Specifically, 854 to 960 MHz was allocated for mobile services. Subsequently, in WRC2012, Digital Dividend One was created in the 8800 MHz band in Europe and Africa, and WRC15 digital division too was discussed. That was the follow-up of that activity. So, as Mr. Rayappa mentioned, this was discussed, these are options with us. So CPM meeting which was preparatory work for WRC which decides that these are the options in WRC. So they actually decided that we will not do any change. Option one, option two is that we can have broadcasting and IMT both as co-primary. Third option was that we have broadcasting with co-primary as mobile but no IMT, and the other option was to have broadcasting and mobile co-primary, and if we want to do IMT, then put some technical limits. So these were the few items which were discussed in the CPM meeting.



However, when we came to the final views after CPM within Europe, there was a different view. The Arabian group had a different view, and African countries had a different view. So, Europe was very sure that they didn't want anything other than broadcasting. The Arab Spectrum Management Group, or Middle East as you call it, was sure of having IMT in this band, especially the 700 MHz band and 600 MHz band, whereas Africa was divided on this. Some countries in Africa were not supportive of this, and some countries were supportive of this, so there was total chaos, and it became one of the most complex items. Finally, the decision was that there would be no change in Europe, but in the Arabian group, there would be IMT, and some countries of Africa would go with IMT, and some countries would not go with IMT, so this was the final outcome. Again, if you see, it is not a primary-on-primary basis; it is on a secondary basis. So, that means that IMT cannot cause interference in broadcasting, and they cannot ask for protection from broadcasting. So, these were a few important aspects for region one in this item.

I will skip the 3.5 GHz band. I will also skip the 4.8 GHz band, and coming to the 6 GHz band because this is important. This is also the uplink for the C-band downlink, which is in the 3.7 to 3.8 GHz band in India. If this band becomes an IMT band in India, then the downlink band of the same band will not be of any use for broadcasting. Maybe we need to look at that way also. This is something which is a point for consideration for the Ministry of Information Broadcasting and to see how they want to tackle this. So I'll just skip this, but this is the outcome for Region 3, that three countries at this point of time are allowed to do IMT: Cambodia, Laos, and Mal use. Others can try, and once they decide to go for this I am in this band, then they can go to WRC 27 and get their names endorsed on the list. 10 GHz I'll skip.

So an important view I wanted to share here was that if I spoke about EBU, they were very happy with the outcome. If I talk of PMSE, they were very happy with the outcome. If I speak about GSMA, which is a mobile Association, they were very happy about the outcome. Nokia was very happy about the outcome. So all those everyone was very happy about the outcome. That is the beauty of WRC. Everyone is equally unhappy and equally happy. So this is the outcome which I wanted to share with you with the outcome of agenda item 1.5. I will skip this. This is basically about new bands for IMT where we are focusing on having 6G Spectrum. So maybe as we talk about convergence, maybe this is another option for the broadcasting community to look into this option and see whether broadcasting can also converge with 6G at some point of time on these frequency bands.

So I will skip this part. This is the actually when you see light from dark room because this was the room which actually decided which frequency bands will be decided for what purpose. This was beyond all other consensus of all other discussions which happened otherwise, irrespective of what were the views of different countries. This was a small group, and we were lucky to be part of the small group which decided what is to be done



with the frequency bands for the Next Generation or 6G Spectrum or what is to be done with one agenda item 1.5. So all this was happened, this happened only in a small room just one day before the final conclusion of the conference, irrespective of what the work we did over more than one and a half months there, and there was also a radio. I'll skip this because this was basically more on doing 6G timelines and finalizing 6G parameters and we as India did actually a commendable job in ensuring that this alliance with the plans which India has in duty or with the vision of Prime Minister Modi here.

And with this, I thank you for giving me this opportunity



# Day 3

Sunday, 17<sup>th</sup> February 2024







# **SESSION-7**

## Innovation in Content Production and Post -Production

### Mr. Senthil Rajan, IIS, Joint Secretary MIB, Gol

Mr. Senthil Rajan joined the Indian Information Service on 17th September 1997. Worked as Prasar Bharati Special Correspondent in Dhaka for both All India Radio and DD News, Director DAVP of Regional Office Guwahati in charge of all North-Eastern states, Director DAVP Headquarters in charge of Exhibitions, Director Directorate of Film Festivals – responsible for organizing National Film Awards, International Film Festival Of India till March 2018., Director (Assignment) DD News in New Delhi in charge of the National News Desk and Social media. He is presently working as a Joint Secretary in the Ministry of I &

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#### Mr. Senthil Rajan

IIS'97, Joint Secretary, Ministry of Broadcasting, Gol

### ADDRESS

Good morning, everybody. I think on a winter morning, we are all here for a very special session. And as I understand, I was just speaking to Sunil Josh, who is the president of BES, and he was telling me about how interesting and what a good gathering you have been having for the last one or two days over the BES Expo. And it's almost 30 years that BES is organizing this Expo, and the fact that we have so many exhibitors talks about how popular this is and how important it is an event in the broadcast sector.

Today's topic for us, which we are focused on, is content innovation in content production and post-production. So, I think we have an eminent panel. We have Mr. Rashmi Ranjan Kanungo, who's a seasoned media professional with expertise in media and business management. He has global experience in live sports production management, including managing properties like Commonwealth Games, ICC, IPL, BCCI, and PKL, to name a few.

He's currently with Tata Communications. We also have Mr. Murlidhar Sridhar, who has over 26 years of experience in the technology industry, encompassing product management, entrepreneurship, R&D, and organization building. He is currently the Senior Vice President at Prime Focused Technologies. They are also focusing now on AI, and I think that will be a very important topic that you would like to hear from him.

We also have Mr. Naoki Nakatani, who's come all the way from Japan. We welcome him to this gathering because he has traveled especially for this conference, and I think that shows how much importance they have given from Japan to this event. We thank you, sir, for joining us.

We also have Mr. Rishi Sinha, who is the Executive Producer Editorial Network 18 Campaigns and Events. He has been with them from September 2022 and has a wide range of experience in both content development, team management, public policy, and he's been working with the broadcast sector for more than a decade.

Today, we have a very eminent panel which will be giving you inputs on various aspects related to content innovation in content production and post-production. I thought just to set the ball rolling, I will make a few remarks on certain issues related to this topic, and then perhaps the panelists can take over one by one.

Initially, I think there are two or three things everybody says, and I think this is an oftrepeated phrase: 'Content is King,' which everybody knows because I think all of you in the industry will be very familiar with, which actually drives the industry. But if you look at it, I think we are at a Technology Expo.

So, if technology is a backbone on which any broadcast industry survives, content is the engine which pushes the system for new frontiers because ultimately, as long as there is



an audience which watches your content, then only the broadcast industry can survive. So, I think that is very important, which every management realizes, and they keep adapting innovations as much as possible.

But, as far as our country is concerned, we are a huge country, diverse in languages, and there's also a huge audience which is there. So, there's a big competition for good content, and that is a big challenge which all broadcasters face.

So, that is an important issue, and for that, you need to have very innovative content. And today, we in the ministry are focusing on showcasing India as a content hub for the world. So, it's not just in TV, but films, animation, gaming. So, the ministry has been engaged very constantly in ensuring that we are able to position India as a global content hub.

As far as that point is concerned, I think there is a lot of investment that needs to go into creating intellectual properties which are India-owned. So, this is something which the creative persons in the industry are working towards, so that will be very important.

Further to that, I think the formats of delivery of content have also changed. It's very changing very rapidly. Gone are the days when we were only looking at delivering content on television. Now we have so many mobile devices, tabs, so content formatting is also very important. So, I think some of the panelists can throw light on that.

I think COVID was an opportunity more than a challenge because it changed the pattern of production. Earlier, we were all in the studios, live OBs used to happen. But when the COVID challenge came in, most of the news channels had to adapt to remote productions, with anchors sitting at home and putting out news bulletins from their homes, which was remotely produced by their panels at the studios.

So, we adapted very quickly, especially with more than 300 to 400 news channels in India. Most of them operated during the lockdown, and especially, if you take the case of DD News, we were 24x7. There was not even one day, even despite some times we had to shift our production bases within 24 hours, we still managed to continue production because of the remote options that were available to us.

The other thing is about technology, which I think all of you have already seen. We've seen some good stalls outside; new technologies are coming up. So, it is a matter of adapting technology and content so that the reach of the content reaches manifold.

Then comes to the quality of visuals. We are changing very rapidly. If we were in SD, now we have moved to HD. I think in Japan, you are on Super HD. So, they all are moving very fast. And I think to give credit to Prasar Bharati, DD went on 4K completely, and the coverage was widely appreciated across the world. And now it has become a norm for most of the important events; Prasar Bharti is doing complete 4K coverage.

So, in that way, the quality of visuals takes over because as technology improves, the quality of visuals has to improve. And the next two big things, I think, which have happened in the last four, five years is what I call the democratization of production. Today, every mobile device is almost a production device. People are making their own content on reels, Instagrams.



So, there's a challenge between the common citizen and the broadcast houses to produce good content because there are so many individual YouTubers or Instagrammers who are actually producing their own content on their mobile devices or mini devices, whatever they have, and they are able to put out good content.

And as I mentioned, the last big challenge or which is going to actually change the entire broadcast industry is the AI technologies that are coming in. This is actually a competition between man and machine. However, machines are creative; however, they learn to be creative, but I think ultimately, human minds might prevail over AI. But still, we will have to see how AI can be adapted for good technology production.

So, these are some of the things I thought we will flag, and I hope the panelists will be able to throw some light because most of them are widely experienced. So, we will start, I think, with Mr. N.A. Nakatani.

Please initiate the discussion.





### Ms. Rashmi Ranjan Kanungo

Tata Communication: Remote Television Production

Rashmi Ranjan Kanungo is A seasoned media professional with expertise in Media and Business Management, has Global experience in Live Sports Production Management, managing properties like CWG 2010, ICC, IPL, BCCI & PKL. Currently with Tata Communications, General Manager, Global Media, Entertainment & Sports Services at Tata Communications Ltd. responsible for Product Management & Business Development in the Media, Entertainment & Sports vertical. He has pioneered remote production technology at Star Sports, contributing to a paradigm shift in content acquisition & creation.

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1x 4K UHD 12G HDI

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#### Ms. Rashmi Ranjan Kanungo

Tata Communication, Remote Television Production

### ADDRESS

Hi, good morning, everyone. I would like to start by expressing my gratitude to everyone here, and it's truly my pleasure to be part of this event. I wholeheartedly agree with Mr. Senthil Kumar's insights into the ever-changing landscape of media acquisition and distribution. While our company, Tata Communications, is known for being a Telco, we have been actively involved in media content acquisition and distribution for over a decade, making us one of the first adapters and global leaders in centralized and distributed content acquisition.

Let me share a recent project of national importance, the opening of The Ram temple in Ayodhya. We partnered with Prasar Bharati to bring their Ultra Definition content from Ayodhya to Prasar Bharati. This involved demonstrating remote production with six feeds being produced out of DD News in Mundy House while the main feed was produced in Ayodhya. Despite challenges such as the absence of fiber near Ayodhya and Z-level security, we successfully implemented this new workflow.

To illustrate the challenges, we had to pull fiber for over 12 kilometers to reach the temple, navigate security concerns, and address various technical hurdles. We utilized both fiber and public internet, creating pathways for 4K ultra-high-definition signal transmission and remote production services for Prasar Bharati.

Now, moving to IP-based centralized production workflows, Tata Communications, being a global leader, has invested in major events and companies worldwide. Key drivers for adopting centralized production include the need for content regionalization, challenges in venues supporting multiple feeds, scarcity of technical resources, and the global shift towards Net Zero carbon. Additionally, as we move from HD to ultra-high-definition, centralized production with fiber connectivity becomes essential.

From a distribution perspective, the globalization of content has become crucial. Centralized production facilities play a pivotal role in adapting content to different platforms and formats, supporting the journey from HD to ultra-high-definition. This allows content creators to maximize their ambitions while reducing travel costs and carbon footprint.

Centralized production workflows enable efficient remote production, and Tata Communications has been a leader in this space. Our dedicated media global network, sitting on top of our core network, positions us as a 360° solution provider in the media ecosystem. With media-enabled cloud and edge nodes strategically placed, we offer a unique perspective and tailored solutions for media workflows.



As one of the world's leading tier-one telecommunications companies, Tata Communications has been deeply invested in the media ecosystem, providing extensive services to top companies globally. Our commitment to media is evident through our dedicated media global network and media-enabled cloud.

We have successfully implemented remote production solutions for major events and companies. Our journey in remote production started in 2015 with IPL 2018, where we went remote, enabling the production of seven languages from our central facility in Bombay. This innovative workflow allowed commentators to be at the venue and remotely engage with matches, setting a precedent for subsequent events, including PKL and ICC events worldwide.

Tata Communications has been a trusted partner of Formula 1 since 2012, providing broadcast connectivity globally. Our collaboration enables the delivery of the live broadcast, bringing the excitement of Formula 1 to fans worldwide. This partnership showcases a unique industry-leading success story in technological innovation.

In conclusion, Tata Communications is committed to driving advancements in media acquisition and distribution, leveraging centralized production workflows and cuttingedge technology.

Thank you for the opportunity to share our insights and experiences.





### **Mr. Muralidhar Sreedhar**

Global Head & Sr VP, Prime Focus Technologies

Mr. Muralidhar Sreedhar is Currently the Senior Vice President at Prime Focus Technologies, leading PFT's Global Product Management and Al functions, he holds a Bachelor's degree in Computer Science and Engineering. He is also the Core inventor of the granted US patent on Machine Wisdom.

> 28th International Conference & Exhibition on Broadcast & Media Technology







#### Mr. Muralidhar Sreedhar

Global Head and Vice President, Prime Focus Technologies

### ADDRESS

Hello everyone, it is an honor and a pleasure to be speaking at this Summit today. And I'll talk about the Talk of the Town, which is artificial intelligence and machine learning, and how it's impacting virtually every industry, every vertical. And, media, which has always traditionally been thought to be the last bastion that will be touched by AI, has fallen first. You have seen a lot of generative AI that's coming in that's significantly making a difference to how the production workflows have been typically happening.

So quickly, about myself, I had artificial intelligence and machine learning for Prime Focus Technologies. I'm also the global head of product management there. And one of my charters is to see how I can bring AI into each of these verticals, inside the media and entertainment industry. So, if you look at how the timeline of AI adoption has been, around 2018 to 2020, we used to see some incubation, some initial POCs that were being done. Subsequently, The early adoption of AI happened around the time the pandemic hit us. A lot of people who stayed away from AI till then were starting to take it seriously because they could not get people to offices quite often and that's when we started seeing early adoption.

Subsequently, generative AI came in around last year, right around after which it started to become what used to be boardroom conversations to dinner table conversations. So the CEOs who used to look at it from a distance started to listen about generative AI from their children, and their wives. Everybody started using AI like ChatGPT and started to understand how it can work and how it can still be useful even though it's not perfect. And that became a catalyst and because of this the adoption over the last year, in terms of AI, has significantly improved. And of course, we hypothesize that around this year and the next year, probably there'll be a lot of mainstream adoption of AI in significant volumes. So, 2024 and beyond is probably just the right time for AI adoption. It's going to make a lot of changes.

We've been seeing a lot of news coming in the last few days with the release of Gemini and then, the Soro model that came in from ChatGPT yesterday. So significant amount of disruption is likely to happen in the marketplace, and because of this, every vertical in the media supply chain is getting impacted. So I'll talk about how it's impacting each one of these verticals and how you can potentially take advantage of Al in your workflows.

Starting with production, there is a charter that we are going after wherein we say that we want to have a single pane of glass for production. I'll give you a couple of examples of what this means. There are a lot of products that are being used in production today and



starting from the script, the moment the script comes in, generative AI today can analyze the script and it can extract metadata out of this. It can break the script into scenes, it can identify descriptions and it can do various analyses on top of it. It can identify the dialogue and the character names. Post that, the production process starts and then you get a newer version of the script with some changes. So the initial character names or the actor names were all kept secret and later on they were replaced with real actor names after the decisions had been made. At that time, AI can automatically compare these two scripts, identify what changes have been made, and percolate it right through the rest of the metadata in the production supply chain.

So a lot of these kinds of uses have come in as well. When you start creating rough cuts, you compare a couple of versions of the rough cuts. Then you can have an Al co-pilot that first looks at the rough cuts and then identifies the differences, and then brings it up for review. So review and approval processes are getting impacted again by Al.

Once the production happens, you get into the library, the content is inside your archive. So, archives that earlier used to be in tapes later on moved into files. But once they are in the files, are we using them well enough? Can we bring in content back from the tapes and use that? And if we have to do that we have to find the content in the first place.

So to do that, there's a concept emerging called the active Library. So the library that used to be fairly static and fairly dumb is starting to become more active because AI is helping organize the content. There are people we have worked with who have about 10 to 15 versions for a title and there are customers we have worked with who have about to 300 versions 1,800 files for one title. In such cases, a massive amount of content needs to be de-duplicated, costs are burgeoning, and then if somebody makes a sale they don't know which version to pick up and then distribute for that sale. So, AI comes in, does automatic analysis of this content, and helps you de-duplicate and prepare ready-to-use distributable masters and then after all this is done, it is very important for us to go and do clipping and then shorts and clips for social media and digital distribution. This generative AI is coming in to help you identify the right clips for distribution.

This is what we call as Discover

When you get down to discovery of content, you look at generation of deep metadata using traditional AI which has been identifying people, places, objects, keywords and transcript, and putting all of that together with generative AI. The tool allows a Google-like search into your content archive to be able to easily extract the content and hence do the downstream distribution of the content.

Another interesting use case, segmentation. Typically broadcast content comes in with black frames, colour bars, slates and actual content. Also, inside the content, there are different markers- there are recaps, there are pre-caps and there are end credits. And when you want to distribute that to an OTT platform or do any sort of digital distribution, you have to eliminate some of these segments. So, a customer of ours, at the time when



the pandemic hit, wanted an automation of this using AI because they could not just get people to come and cut these. Subsequently, it's been in use for about 4-5 years now, since the time the pandemic hit. We call it an AI co-pilot as we are not replacing people with AI, but AI is working as a co-pilot along with you.

Al takes the first jab at the job and then a human can correct it. Al comes and looks at marking all of these segments automatically and then a human comes and corrects it. If Al got it wrong today, it will learn from the next day, from the QC that was done by a human. So this is bringing in about 95 to 99% accuracy, bringing easily 60-80% automation in that workflow. So, people are getting more efficient. A customer of ours, a large broadcaster in the UK, used to spend about 20 minutes marking these segments in a 1-hour show and about 40 of them. So today Al does the automation and then they come and do a correction in about 150-180 seconds. Roughly, 90% of a person's time has been released back into creative work because a lot of these mundane jobs have been picked up by Al and it helps them give get time back into their hands.

Another interesting use case is Al's ability to compare videos like a human would do. This is not picking up two videos, extract the frames and compare frame to frame, image to image and pixel to pixel. So one could be finished content and another one could be unfinished content, one could have green screen and another one could have VFX, one could have text localized in one language and another could be text in different locale. Now when you have this kind of content you have to duplicate or manage the versions of these you need somebody who can look at it like a human does and that takes hours and hours of effort.

The second use case is digitization - we used to digitize tapes in SD in the decade of 2000, and now HD and Ultra HD digitization prevails. When you do that, you have to recreate the VFX and you have to redo the edits. So you don't know what from the source actually made it to the final master. So all of these analyses today are being brought to life by Albased comparators which can read through the content, analyze the content like a human and give you Edit Decision Lists (EDLs) with which you can do the remastering as well.

Localization is probably one of the most important things for us as we are a very diverse country. We have AI localization co-pilots which can do typical transcription, translation and what we call as forced narration. Forced narration is when we have text in one language and it's being broadcast to another area where the language is different, or there could be content or signboard which is of one language and needs to be translated. Forced narration is done typically done by humans, but AI can identify where there is actual content that needs to be forced narrated, give you a suggestion for forced narration, so that a linguist can only look at that small percentage of content where you actually have text.

If you have 100 minutes of content and you typically have only five minutes of content to be forced narrated, AI can tell you which places must be force narrated. Then the linguist can function efficiently with this AI co-pilot. Text to speech is also becoming fairly important;



even a year back people did not take text to speech so seriously. As the accuracy of Al models is improving significantly, it can do voice modulation as well. Somebody can make a speech in a particular language and have it translated across several languages, either live or over digital media. Text to speech brings in a lot of efficiency and achieves results far more faster than it used to when work was done completely by a human.

Lastly, talking about this accuracy that we've noted over the last few years, content has moved from 60-65% accuracy to the 90% accuracy range. The content houses who have been engaging us, who typically want to get this done, get about 10,000 hours done in a week's time and distribute that across. That's humanly impossible. So, AI co-pilots come in to work along with humans to make this happen much faster.

Of course, there's the matter of understanding all the content once it's prepared. Moderating content, especially in large volumes, requires significant time. To identify what time a content should be broadcast and what kind of audience should be targeted, you need to have an analysis of various factors: language, explicitness, suitability for the intended audience. So, all of this analysis is being done by AI, not humans.

Then there are typical marketing scenarios where generative AI provides insights, creates scripts, generates promo briefs, trailers, and suggests appropriate content, including shorts. For instance, if you have horizontal content that you want to convert into vertical format, AI can automatically reframe it. This allows for a seamless transformation, where AI identifies key elements, such as dialogue or action, and adjusts accordingly, maintaining about 90-95 percent accuracy."

Then you have typical marketing use cases where generative AI is able to give you insights and recommendations. It can give you a script for what the promo should be built like, it can create the promo brief, it can create trailers, it can help you search the right kind of content and suggest shorts as well as give you ready-made reframes using generative AI. So if you have horizontal content and you want to convert it into vertical format, AI can automatically reframe it because new generations are happy to just watch it vertically. Instead of producing vertically, as many sports broadcasters are doing today, you can utilize AI to look at what is important in the horizontal content and automatically reframe it. So we have solutions today that can take in a horizontal video, completely transform it like a professional editor would do. It will not be a fixed viewport in a horizontal video. In fact, if there are two people talking, it can switch between the two of them. If there's a ball to be tracked, it can track it automatically. So all of this is becoming possible with AI, typically at about 90-95 percent accuracy.

Lastly, in packaging and distribution, you can have automatic ad markers placed at interesting places, easily distributable masters ready to go for sale. Al can help confirm which masters to pick up and distribute, confirm the content across different languages and ready-made thumbnails and compliance stacks. The outcome that of all of these bring in is about 20 to 90% efficiencies in the workflows. Things can get done 20 to 50% faster.



There are times when things can get done virtually instantly. Lastly, AI is not replacing humans. AI available as co-pilots can co-work along with human specialists just to make them far more efficient. So typically what happened with the Industrial Revolution in the last century and then subsequently the IT Revolution that happened in the '90s and the 2000 decade, I think the AI Revolution is making the same thing happen now.





## Mr. Naoki Nakatani

NHK Media Innovation Centre, Japan

Mr. Naoki Nakatani is an engineer at NHK (Nippon HosoKyokai, Japan Broadcasting Corporation), engaged in Sign Language CG (SLCG) projects at NHK Science and Technology research laboratories and NHK Media Innovation Centre.





#### Mr. Naoki Nakatani

Engineer, Nippon Hosokyokai (NHK)

### ADDRESS

Good morning, everyone. Okay, to start, I'm now from NHK, a public broadcaster in Japan. I belong to the Media Innovation Center in Japan, founded just last August. As an engineer, I participated in a seminar two years ago. The right-side video of the SL is a simple video I made this Tuesday within a few minutes. Okay, that means, thank you. Thank you for inviting me to this session.

First, I would like to introduce NHK. It is the only public broadcaster in Japan with 54 branches. Each local branch produces local programs, and we also have news programs on weekdays, day and night, and on weekends. The second feature of NHK is the Science Technology Research Laboratory, also known as STL. It was founded around 90 years ago, and we have approximately 200 researchers in the laboratory. One to three researchers hold PhD degrees.

Now, about our Sign Language CG web services: By scanning the QR code on the left-down side, you can directly access our website through your smartphones. The website title is related to weather and preventing disasters. In normal times, we provide information for 142 points in Japan. In emergency times, we provide information about weather emergencies, warnings, or tsunamis. The remarkable point of this service is that all CGs are generated automatically.

In January of this year, on New Year's Day, major tsunami warnings were provided through the web services. I would like to explain NHK's research and development. As a public broadcaster, one of the most important missions is to protect the lives and properties of people in Japan. We deliver sufficient information far and wide. Another mission is to expand CG services.

There are about 340,000 people who are deaf or hard of hearing in Japan, and approximately 20% of them use sign language. However, it is difficult to expand sign language programs due to the limitations of interpreters. It is almost impossible to have interpreters available 24/7 in all 54 branches. So, we aim to research and develop the necessary information, such as news and weather.

This is our generation system. The system uses Japanese text as input and generates sign changes automatically. Firstly, the Japanese text is translated into Japanese sign language word sequences. Individual motions are read from the motion databases and concatenated to generate signs. There are two challenges: generating sign word sequences and ensuring the accuracy of grammatical elements during concatenation.

There are two methods of Sign Language Generation: Fill in the Blank method, we prepare



templates with blanks, such as sunny, cloudy, or rainy. The blanks are filled automatically with information from the meteorological agency. This method ensures that our SL CGs are without any mistakes. However, the disadvantage is that the exploration is limited to prepared templates.

The AI-based translation method is the second method we are researching and developing. In this method, real-time sign generation occurs without any prepared templates. The input data is Japanese text, which is translated into sign language sequences and then concatenated. Our motion databases, built over ten years, include Japanese and Japanese sign language sentences. This allows us to correlate sign sequences and add supplementary information.

With the correlation tool developed in-house, we can correct sign sequences and add supplementary information, such as mouthing. Supplementary information helps understand the context correctly. Our AI-based system has immense potential for realtime sign generation without templates.

In the future, we plan to use this system for various services, such as announcements in trains or real-time interpretation in places like hotel receptions or conferences. Thank you for listening.



## **Mr. Rishi Sinha** Executive Producer, Network 18

Mr. Rishi Sinha is a seasoned content professional with expertise in content development, project management, campaign planning, and currently serving as Executive Producer (Editorial) at Network18 Campaigns.





#### Mr. Rishi Sinha

Executive Producer (Editorial), Network 18

### ADDRESS

Respected chair, fellow panelists, and esteemed individuals present, I am honored to be here today to discuss the transformative innovations and challenges in content production and post-production. With over 15 years of experience as an executive producer, I have witnessed the rapid changes in the media industry and aim to encapsulate these developments in the next 15 minutes.

The media industry, especially content creation, has undergone a phenomenal transformation at the speed of lightning. Today, technology evolves quickly, and understanding these changes is not enough; we must empower ourselves to shape the future of storytelling and audience engagement.

Starting with AI-driven content generation, this revolution has impacted various aspects, from editing and scriptwriting assistance to enhancing efficiency and optimizing viewer engagement. AI streamlines editing tasks intelligently, allowing creative teams to focus on strategic aspects. Machine learning contributes to plot suggestions and script adaptations, saving valuable time during the editing stage.

Immersive realities, including augmented and virtual realities, have become prominent on news channels. This extends beyond covering events; it seamlessly integrates polls, Q&A sessions, and viewer-generated content, providing a tangible influence over narrative progression. The time is approaching when viewers may virtually enter studios, walking alongside reporters covering breaking stories.

Virtual production and real-time rendering, once reserved for high-budget filmmakers, are now accessible to news channels and smaller enterprises. LED volumes merge seamlessly with real-world sets, allowing directors to adjust lighting, set design, and camera positions in real time. This enables unparalleled experimentation and instant refinement on the spot.

Cloud-based collaborations and remote workflows have advanced significantly, enabling global collaboration while reducing production timelines. Organizations can engage ideal talent for every role, regardless of geographical constraints.

Branded content, seamlessly weaving brand messaging into narratives, has evolved into a compelling storytelling tool. Successful examples include integrating products into TV shows or using adventure sports videos on platforms like YouTube for promotion. However, the success of branded content lies in its appeal to viewers and maintaining a balance between advertisement and engaging narrative.



The rise of user-generated content (UGC) signifies a democratization of content creation. Platforms enabling UGC have transformed audiences from passive consumers to active co-creators, fostering authenticity and meaningful engagement.

Challenges include bridging the skill gap through constant upskilling, responsible Al usage to address bias and guard against misinformation, and embracing lifelong learning in a rapidly evolving media landscape.

In conclusion, by strategically implementing and embracing these cutting-edge technologies and innovations, we can craft a compelling and impactful future for media. Thank you.





### Mr. Akshay Sharma

Co-founder, Personate

Mr. Akshay Sharma is the CEO & Co-founder of Personate.ai. He is an alumnus of IIT Roorkee with a patent in the area of psychometric systems. He was also part of the National Startup Awards cohort and accelerated by Amazon ML Elevate, Nvidia & NASSCOM. A co-founder of SCIKEY.AI, a recruitment SaaS platform, with strategic investment from SRK Exports Family Office he launched World's 1st Synthetic AI News Anchor, Sana, with Prime Minister Modi, reaching a daily viewership of 200 Million+. He is also active in cross-cultural relationships between India and Finland.





#### Mr. Akshay Sharma

Co-founder, Personate

#### ADDRESS

Good morning, everyone. I'm Akshay Sharma, the co-founder and CEO of Personate. At Personate, we are dedicated to building an AI ecosystem for content production at scale with synthetic humans. Currently, we are being accelerated by AWS, Nvidia, and Nascom. So, what exactly do we mean by synthetic humans? Synthetic humans could be real human clones or entirely new beings created to generate content at scale. In today's presentation, I will walk you through some key points, starting with the present-day challenges in production, followed by various AI use cases for production. We'll then delve into a case study on AI Saana, the world's first AI news anchor synthetic. Finally, I'll provide a brief overview of the Personate platform.

Now, let's discuss some present-day challenges. Through interviews with over 100 stakeholders across different corporates on content creation, we identified significant challenges. One major hurdle is the time it takes to create content at scale. Additionally, re-recording content due to issues or events, the associated costs of travel and managing people, and the expenses of translation further complicate content creation. Creating personalized content for end viewers and addressing the lack of skills, as highlighted by some of our panelists, are also prevalent challenges.

On a macro level, creating high-quality content today takes weeks of production time, necessitating heavy investments in studio equipment and setup. Managing a large workforce adds to the complexity, along with the substantial costs of traveling to new locations for shooting. The inability to create personalized videos and content limited to one language further compounds the challenges.

Now, let's explore certain AI use cases that bridge these gaps. AI, specifically the use of LED walls, is making a significant impact, as demonstrated by shows like Mandalorian. 3D generated backgrounds using AI can be realistically embedded with unreal assets, such as digital avatars. The ability to mimic the motion of a person into animated characters is showcased through an example using my own avatar.

Over 34% of businesses report measurable ROI in the movie industry with the use of AI, particularly in generating hyper-realistic 3D backgrounds. The next use case involves saving time and effort while building a brand. AI allows for the reduction of production time from days to minutes, a shift showcased through an overview of the Personate platform. This cloud-based platform enables the creation of scripts, music, 3D or 2D backgrounds, translation, voiceovers, hyper-realistic voices, captions, and even synthetic brand ambassadors.



The platform's SAS-based approach empowers users to create content within minutes that traditionally took several weeks. Businesses, including some of our customers, are generating hundreds of videos per month, with millions of views and substantial earnings projected. This underscores the acceptance of AI-generated content by viewers.

The third use case emphasizes building a personal connection with stakeholders. Personate launched a campaign with ZTV, where viewers could receive personalized messages from actors during a show by scanning a QR code on the TV channel. The success of this campaign, engaging millions of people, illustrates the potential of connecting with end viewers at a personal level.

Additionally, the use of multilingual AI allows organizations to connect with people globally, breaking down barriers to content creation. This capability has been employed during the G20 Summit, delivering real-time news in local languages to all G20 country embassies.

Now, let's delve into the case study of Al Saana, the world's first Al news anchor synthetic. Launched in China and later in India, Al Saana has become the first Al anchor to stream on prime-time shows with a daily viewership of over 100 million. Notably, Al Saana also provides real-time automated weather updates, a groundbreaking development in the media industry. This case study showcases the major impact on business metrics for the media and entertainment industry, leading to significant savings in royalty and production costs.

Furthermore, AI Saana has reached over 100 million viewers across web and TV, attracting brand sponsorships and becoming a means of revenue generation. Digital humans are gaining social followers, and people are even falling in love with them, as demonstrated by the level of engagement seen in the screenshots.

Finally, I'd like to introduce the Personate AI platform. It serves as a comprehensive solution for all video generation needs, offering ultra-realistic voices in 100+ languages and accents. The platform can generate scripts, backgrounds, translations, and more through a cloud-based AI SAS, allowing for instant actor cloning. It enables video production from any device, anywhere, and supports the generation of millions of videos in parallel through API infrastructure.

In conclusion, Personate is committed to building this technology in India for the world, creating a transformative impact on content production. Thank you for this opportunity, and we look forward to the future of AI-driven content creation.

Thank you.



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# **SESSION-8**

Content, Marketing and Monetization Strategy for OTT

**SESSION CHAIR** 

**Alok Agrawal** Co-founder Al4 India, Former Member of Prasar Bharati Board



Mr. Agrawal works as an Innovation and Business Consultant. He has recently co-Founded Al4India forum to promote development of Al solutions for all Indians. As a media professional, Alok has earlier worked as Member Prasar Bharati Board, Group COO at Network 18 and CEO at Zee Media. He has also been an advertising professional, having worked as COO of Cheil Worldwide (A Samsung Group Company) and agencies of the WPP Network. An IIT Kanpur, IIM Bangalore and Wharton alumnus, Alok has led large corporations, startups, mergers, acquisitions and many successful brand launches.

Pankaj Krishna CEO, Chrome DM



Pankaj Krishna began his entrepreneurial journey in 2008 when he launched Chrome track after a work experience of over 10 years. They were mostly in the broadcast and media industry across STAR, India Today & UTV. From having started his career as a door-to-door credit card salesman in 1996 working in a DSA of Citibank, to selling paints and marketing engine oils for TATA BP in North India, his career took a turn when he was initiated to the world of television, in August 2000. During his tenure in the media sector, Pankaj saw and witnessed an increasing demand for an unbiased 'audit' company to facilitate strategic decision-making while providing ground realities of the TV Cable & Satellite universe. Chrome DM was launched to offer a one-stop solution for break strategy and research, on-air presentation and planning, distribution audits and optimization.



#### Harit Nagpal CEO, Tata Play



Harit Nagpal (born 2 November 1961) is the Managing Director and Chief Executive Officer of Tata Play, formerly known as Tata Sky, since August 2010. He has nearly four decades of experience in the industry. Nagpal spent his first 15 working years in the packaged goods industry with brands like Lakme, Marico & Pepsi. He took over as Managing Director and Chief Executive Officer of Tata Sky in August 2010. Before that He was Global Director Marketing at Vodafone. He had also served as Director of Marketing and Business at Vodafone India Limited. He co-authored a case study on the subject of disruption "Tata Sky: Responding to a disruptive technology" which is now a part of the curriculum at the London Business School. His book titled "Adapt - To Thrive, Not Just Survive" was released in December 2023.

#### Ramsai Panchapakesan Head, Havas Media



With an illustrious career spanning over 25+ years, Mr. Panchapakesan is well-positioned to drive partnership strategies, leveraging his robust industry experience and relationships with media partners. His deep understanding of emerging trends, consumer behavior, and market dynamics positions him at the forefront of creating innovative investment approaches. Previously serving as the Senior Vice President & National Head - Media Buying at Zenith Media . Mr. Panchapakesani played a pivotal role in driving the integrated media business operations. His exceptional leadership skills ensured the seamless execution of annual plans and optimized cost efficiencies. Ramsai also held the position of Agency Trading Head at GroupM m/SIX previously, further solidifying his industry expertise.




Prasana Krishnan is the Co-founder of FanCode. Founded in March 2019, FanCode is a premier sports streaming platform committed to giving fans a highly personalised experience across different sports in international and domestic competitions. FanCode has over 50 million users and is a part of Dream Sports, India's leading Sports Technology company with brands such as Dream11, FanCode, Dream Capital, DreamSetGo and DreamPay among others in its portfolio. FanCode has partnered with domestic and international sports leagues and associations across multiple sports. Prior to this, Prasana spent over 5 years as the EVP and Business Head for the Sports Channels Cluster at Sony Pictures Networks. He was instrumental in setting up and expansion of the sports broadcast business of Sony in India. He was the Chief Operating Officer of Neo Sports prior to that. A media and sports industry veteran, Prasana has spent over 2 decades in the sector across leading companies such as The Times of India Group, Arthur Andersen, Nimbus Sports, Neo Sports, Sony Pictures Networks and FanCode.



# Content, Marketing and Monetization Strategy for OTT

## SESSION CHAIR

**Mr. Alok Agrawal:** First of all, let me thank BES for having us over for this session. Our session is going to talk about OTT and all the aspects related to it. OTT has emerged as a strong source of entertainment and content over the last few years and it's growing rapidly as we all know. But there are lots of challenges as well when we talk about OTT especially in India and we hope to cover some of those with our panelists today. So I'll start with some perspectives.

We hope to cover three different segments - one is content. When we think of OTT, the type of content which goes on OTT may need to differ from what we have traditionally seen on television or in movies. There are opportunities to further sub-segment the market. Different kinds of audiences require different kinds of content and with OTT that can be delivered. It opens a vast opportunity for existing content to go to a larger number of people because the same content can be dubbed and redubbed in various other languages. So I'm sure all of us are watching content from around the world. Korean content is very popular in India, we are watching Telugu movies and Telugu content, or Malayalam shows etc. sitting in Delhi and vice versa. So it gives a great opportunity for content to reach much larger audiences around the world.

Additionally, we are also getting exposed to new varieties of content because it is no longer content which is catering to just the lowest common denominator for mass appeal which television used to do. However, the related aspects are that the more content you create, the more costs are incurred. Therefore, you need to recover the cost. So it is constantly under review what the monetization strategies are for OTT. There are two broad models which people talk about, but are there new options and opportunities? What are the challenges going forward? And then how do we market OTT platforms and content within OTT because there is a growing proliferation of platforms, both global and local platforms. How do they manage to carve a distinctive identity for themselves? Finally, in all this, the whole aspect of getting trained talent, creating a new talent pool to address all aspects of these markets.

So let me start by first inviting Harit to share his thoughts. He has a bird's eye view because he works as an aggregator platform for all television channels traditionally, and also aggregates all OTT channels. He has access to a lot of information for the platforms which are under the Tata Play portfolio. Welcome Harit and over to you.



**Mr. Harit Nagpal:** Thank you. Thanks a lot. I spent about four decades in the industry, moved six industries in the process, each one different by design. I did not take a second job in the same industry because I did not want to destroy what I created. Every industry I went to told me something. Every industry I went to, they said this industry is different. Whatever principles apply in the other industries don't apply here. We are unique. I'm sure you've heard these things before, like people from the government here would have heard this when they moved ministries also "this ministry is different". And my question used to be, isn't your product consumed by consumers, consumers who buy a cola, a candy, an airline ticket, open a bank account, buy a life insurance policy? They use a certain criteria for buying a product and selecting between brands. That can't be different when it comes to a cola, candy, a life insurance policy, opening a bank account, or buying an airline ticket. It is quite similar. There is a basis that they have. So how can your industry be different? You have to start looking at the consumer, not at the technology that you are.

And when I got the subject today of what is the production marketing monetization principles\ of OTT, I was wondering if I was making bread which was earlier selling in stores and if suddenly I start selling that bread online, would the marketing or monetization principles of that bread change? Would I start giving it for free just because it's digital? But that's not what I see in the industry today. If you look at the content that is being offered to customers, barring one or two maybe global apps, one or two almost every national app is recycling what is being shown on television, almost 80-90%. Every one of these apps has one original or two originals coming out in a year. The best ones have three and everything else is last night's soap shown for free.

So first of all, you're talking about monetization of OTT, we need to stop the demonetization of Paid TV. That's the problem that is being created. You are hoping that, you know, customers will watch it for free for so long, and that's your marketing strategy, that then they'll start paying. I can bet you, stand outside Pragati Maidan and offer people for 365 days for free. On the 366th day if you go to them and ask for 10 rupees for the same plate of Biryani, they're not going to pay for it. I can bet you on that. You want to try it? I'm willing to pay for the first 365 days, but if you don't get 366 customers, please pay me back for the 365 days I'm willing to invest in. So that's what I don't like.

So my short answer to your question really would be, a new technology, a new delivery mechanism has been invented to go to the customers. It offers you two things: one, it offers you an opportunity for user-generated content. Also, to a certain extent, the thing about dubbing Korean content and content from the world, I see no reason why it can't be done on a broadcast medium. It is being done. We are carrying dubbed channels. I mean, I'm dubbing English into Hindi, Hindi into Malayalam, Malayalam into Hindi, Malayalam into Tamil, so all that is happening. We got channels that are running all the time doing that. So that's not the difference. So to me, it's the same bread. It's a new technology. I don't think the marketing of it, the pricing of it, or anything of it can be very different.



from what is happening in Pay TV. And like you rightly said, we run both the aggregations today and we are not differentiating between the two because if you sell one at pay and one at free, the one that is pay will vanish. Thanks.

**Mr. Alok Agrawal:** So just one follow-up question. Do you have thoughts on what could be alternate monetization strategies? I mean, there are two popular models right, either subscription-based or advertising-based. But is there a third opportunity? Like you're saying, subscription, nobody pays in India, and in advertising, reach is low.

**Mr. Harit Nagpal:** So who says that? 110 million households every month, even today, are paying an average of 300 rupees to their cablewala or through their DTH. 110 million homes times 5 people, they are paying 300 rupees. Show me that number for internet. Show me that number for OTT. So what is the problem? It is that we have given it for free, why should they pay?

**Mr. Pankaj Krishna:** I couldn't agree more with you on the 365 days free Biryani point, and that's how we spoil the market. Cable and satellite is at 110 million pay homes into five into 300 rupees. But the fact is, Harit, with the onslaught of OTT and multiple applications coming on, free is the mantra, and we like anything free. And consumers, when they get free stuff, they get addicted to it as you rightly said. Jio went ahead and got the World Cup free, and what bigger than cricket going free? And the objective of that free was nothing more than a brand-building exercise, and that exploded the platform of Jio. So that's the bitter reality we live in. And if you are a big fish, you can obviously go ahead and afford freebies and eventually try and get people on board, and then you come out with premium models. But the fact remains that as far as consumers are concerned, we like stuff that is free. If you have two options, one option is you pay a subscription, like in the case of cable TV where you get 300-400 channels, or if you get content for free but you are exposed to advertising, maybe you might not like the advertising, but the bottom of the pyramid is okay with the advertising as long as the content is free.

So, the data that I've collected, I'll just walk you through. The point that we are trying to make is that in India, we like everything free. When you park your car still, you negotiate with the parking valet that I'm only parking for 5 minutes, why should I pay? That's the attitude that we have. So when it comes to content, we are tuned to consume content for free.

Looking at the market, how do you monetize it? In terms of monetization, monetizing OTT content, one of the most important things is to understand what genres of content work and what genres of content do not work. Harit, I want to address this to you. So we measure content across all platforms, which can be dissected by platform, whether it's consumed on YouTube or a different platform. But if you were to look at the top 10 shows of 2023, crime seems to be rocking. People love crime. So Farzi is the number one show,



Scam 92, Trial by Fire, they're all crime. Crime seems to be working, and as a result, you will see a lot of content driven around crime.

But before we delve into individual shows, I'll walk you through some data. As far as the AVoD and SVoD subscribers are concerned, the current numbers as of January, the subscriber establishment surveys that we do across all platforms put together - AVoD is obviously huge, it's about 200 million. The subscription video on demand, now what is SVOD, where you have to pay, what Harit just said for cable, you pay a monthly subscription. So similarly for an OTT platform, you pay a subscription, and that stands at about 110 million.

Now Harit, this is a cumulative total of all applications put together, right? The number could be disputed whether these are higher or lower, correct? It's correct, coincidentally it matches with the cable and satellite number that you quoted. But the point here is, unfortunately, in my view, AVoD is not the future, bleeding constantly and giving content for free. I think the way forward is SVoD, but AVoD seems to fly because everything is free, people like stuff free. So, AVoD stands at 205, just to recap, AVoD means advertising. Total internet users in India is about 836 million, those with internet connection, which hopefully includes all of you, and the total OTT users is 504, so 205+110 will not add up to 504 because there are a lot of YouTube users and YouTube's maximum base is again free. Most of you, when you upgrade to premium, have to pay a certain amount of money, which doesn't show ads, but most of the base for YouTube as well, unfortunately or fortunately, is all free. These are broadly how the market is landscaped.

Now, we've also dissected is we've taken individual players, the big players in India, the OTT applications. Jio Cinema has 120 million subscribers, but they are all AVoD. Disney+ Hotstar has SVoD and AVoD both. But the majority comes from AVOD, same thing with Sony Liv - AVoD is almost double of SVoD at 36 million, Z5, 3x. MX Player is obviously paid. So if you have a broad look at this chart, you will see AVoD numbers are always higher. Netflix now is also contemplating on going on a free version as well, right? It is to get a broader base of audiences. If you look at the World Cup, I think Mr. Sunil had asked me, or someone else had asked me during the coffee break, the claimed numbers and as for us ourselves, the concurrent numbers during the World Cup touched almost 123 million, which is huge, 12 crores. This was also free. And Tata IPL touched at about 75 million. So these were all events which were extended to the consumers on an AVoD platform, without any subscription. Subscription would have obviously dampened the numbers, but this is the reality of the market.

Okay, I've got some interesting numbers on the top shows again across SVoD and AVoD. On the left side, you will see subscription video on demand. What were the top three shows? In SVoD, these were obviously Farzi, Scam 2003: The Telgi Story and The Night Manager. In AVoD, number one was Big Boss, and then there was Khatron Ke Khiladi. Farzi got 22.5 million viewers, which is huge, but free video or advertising on video on demand touched about 81 million. So the numbers for AVoD are always much, much



higher than the numbers for SVoD, which is evident from this number for the top shows.

One thing, very important, we realize as we work with a lot of producers in Bombay and OTT platforms and actors as well, is to understand the market. For instance, what works. So crime seems to be working like a chicken and egg story. As crime works, we do more crime content and because we do more crime content probably crime works more. So that's what it is at this point in time. Thrillers and comedy are there but it's very important to understand the genre to engage audiences. In crime content, you would have seen Mirzapur and OTT in fact was theoretically launched in India, it was through Sacred Games with Netflix. That was all crime and that's what it is all about.

We also have the gender split of content which comes from our panel. COTT is an application which you can download but once you download it, if you give us consent, we track your viewing habits and basis those viewing habits on COTT, we know exactly the genre being consumed, and the show being consumed. It's fingerprinted so if you're watching something on your mobile phone or a connected TV, it can be tracked but with consumer consent. So amongst the top three shows, the female skew for Telgi and Farzi was at about 35%, but The Night Manager was slightly more towards females relative to the other two which touched about 45%. And why was it higher? Because Farzi and Telgi are crime while The Night Manager was a thriller. So the key takeaway from this is that men tend to engage more in crime. So that's broadly what it is.

So when it comes to crime or content related to crime you tend to shy away females and the numbers are lower. That's a simple take so this is all about data being used to optimize content for consumers. If you were to look at the same three shows- Farzi, Telgi Story and The Night Manager across regions you will see the West and the North at the center at about 35% skew and this is probably because of the population as well or the penetration of internet. This seems to be a uniform trend across all shows. All three of them have a skew towards North and West. South would obviously be less because the shows were primarily in Hindi but now you see a lot of content, you see a lot of actors and casting coming from South as well. The top three shows in terms of age split, OTT is mostly consumed by people of age 25 to 34. So they're almost at 45%/. Age 35-44 also actively watch, so mostly 25 to 44 because older audiences are still into linear and they are happy watching content. They are moving to OTT but primarily they haven't cut the cord and they don't intend to, because there's a habit of using that remote control. That habit that's been going on for the last 20 years is what they want to be on.

One thing which is very important that has come up now is to reach out to more audience, we need the right use of technology and obviously dubbing. So all the big shows you see today, you will have a choice to see them on multiple languages. Tata Sky is one of the first few pioneers. We used to watch a lot of Tata Sky many many years back. So you have this language option so these days every big show in fact you'll have them in Hindi, Tamil, Telugu, Malayalam, Kannada and Bengali. So you have multiple choices and there's a lot of new technologies like neural garage where you can lip sync. So you know if you're



watching a Hindi original in Kannada, you really won't be able to figure out the lip sync because they do it so beautifully with the languages. So all great content, all big content is created in multiple languages so that's a better way of engaging with audiences.

Lastly, on tracking consumption. You get access to all kinds of consumption. A lot of news content that you see now along with linear is monetized on OTT as well. If you look at the numbers, Aaj Tak for example generally leads on news on the digital domain, followed by ABP with almost 120 million monthly users and if you dissect that in terms of cable and satellite to digital, cable and satellite gives you almost about 46%. So that's broadly what the numbers are.

I just want to raise the last current thing on what is in the news today. If you look at the news broadcast across linear content which we track on digital, farmers going to Delhi protest is the leading news of today and yesterday as well. The air time that it took which comes out of this technology was 35% of the airtime of all the Hindi news channels put together. That delivered about 12% of the ratings so was it a good story to carry or not? It wasn't, because it was hugely monetized. But what were the best stories to carry? These would be something like the SandeshKhali protest turned violent that gave the maximum monetization. So there is technology now for news broadcasters as well. We work with them to know which content is working, which news is working, which anchors are working and once you take a mix of that, you can best optimize or monetize it, which is a direct function of the number of eyeballs.

**Mr. K Prasana, Fancode:** Thank you for the presentation. It's gratifying to see validation from leading experts in the industry regarding our strategy of believing in consumer willingness to pay for the content that they want. That's the underpinning part of our strategy, and it's great to see validation coming in from leading experts in the industry in that area.

Talking more about FanCode and the sector that we operate in, the sports broadcast side, and the sports content side, I would put it like this: In the last 15 years, we've seen this industry grow dramatically. We've seen on the linear side some 6 to 8 standard definition channels becoming over 30 plus standard definition and high definition channels. We've seen regional language sports coming into play. There has been massive growth in this area. We've also seen the rise of digital on-demand viewing, the whole second television phenomenon, how personalized viewing has taken over, and the constraints of real estate - the amount of space available on platforms for content to be shown - that's been completely demolished now.

Obviously, everybody is in a position to watch their personalized offerings or what they particularly want without having to go against the wishes of the other people in the family. Almost every major sports platform, OTT platform, has enabled sports streaming. Also, at least among the main broadcasters in the country, yet the most interesting thing that we saw in FanCode is that the content scenario still remains very, very challenging.



The competition for tier one sports has become extremely fierce. Everyone has started depending more and more on a few large sports properties like IPL, ICC, BCCI, etc.

If anything else, their dependence, the platform's dependence on this, has gone up even more. The investment that is going into select areas of sports has gone very, very high as a result. So, the interesting thing is that in the last 15 years, while the number of platforms has increased dramatically, the variety of sports coverage has actually declined. Again, 10-15 years ago, pretty much all international content was available. A lot of it has now vanished from the screens. And what has taken over instead is great depth and quality of coverage on the few marquee events.

From a single stream of an IPL or something, we now talk about 10, 11, 12 language coverages with customized feeds, etc., etc. And at the same time, a lot of, you know, content that used to be available, let's say golf, for instance, if you're a golf fan in this country, the possibility of you being able to watch that on any mainstream platform is now pretty much gone. And that's the problem that we came in to solve. Regional sports coverage was another area in which we observed that while regional language coverage has emerged in a big way, there is really very little coverage of regional sports events coming in from any particular state, etc.

I mean, I'm yet to find adequate coverage coming in on any platform in that area. We also believe that the power and potential of digital is still to be fully unlocked. And that is like Harit also pointed out, more often than not, platforms have often been an extension of their broadcast business. They've not looked at it in isolation on a standalone basis. Concurrency, which is a massive problem in broadcast television, is not a challenge at all in digital, which enables you to bring niche content. And there can be 100 simultaneous matches shown on a digital platform with each one catering to an individual interest, something which linear could not do in the past.

Product innovation and how you tackle the consumer is extremely important. And of course, in this whole environment like was pointing out the man, the monetization part of it is something especially in sports has taken a big knock. By far the biggest events, the World Cup, the IPL, etc., pretty much everything has gone on a free-to-air basis with the assumption that it's ad-funded so it's going to work.

I don't know; we'll have to see how it evolves because I haven't seen that work in the past in my personal experience. The subscription market is definitely at a bit of a crossroads right now, but I'm sure it's a matter of time because I have hope of it. So looking at this scenario, where does FanCode fit in in this whole thing? What is our approach? Basically, we started with a simple principle saying the Indian sports fans still cannot watch all the matches that they want to despite all the expansion in the sector.

The innovations, the number of platforms coming in simply because it is shrinking the coverage of sports events has not expanded to the extent depth has happened. Personalization has happened, language coverage has happened, but today also bringing



in, let's say a domestic event from a domestic football event from the Northeast and making it available locally is still non-existent. An interesting statistic which may be is that in the world of professional sport there are over 200,000 matches played at the professional sport level.

I'm not even going into amateur semi-semi-pro and all the other categories and yet the number of matches that is today available to an Indian sports fan is less than 5% of that majority of it is just not available. So, niche interests are an area which we have identified as an opportunity for ourselves because it's something no one's really focusing on in a big way.

We believe this is a problem worth solving focusing on expanding sports coverage in India. And that's what we've been using the power of digital to get into this, covering domestic regional women's and district-level cricket events, covering state and national level events in kabaddi, in hockey, if you see state-level football leagues, etc. And what we have realized is the fan is willing to pay for this. It's counterintuitive while today the biggest sports events are all free; fans are willing to pay for specialized content if the access is made available to them.

They don't have a resistance to it; they just don't like they want value for money for sure they want the experience to be right. And if you are able to provide it to them, they're happy to engage with you and support you in this area. And similar goes for premium events, international events, which is again catering to niche audiences in this country.

So, our approach to monetization has been very clear. We are focusing on a core fan proposition. We're building a direct-to-consumer business which is looking at comprehensive coverage, providing them all kinds of engagement data, stats, etc. to supplement the live coverage. Pricing is the one area where we believe we have been differentiating from everyone else because we've gone into Sachi pricing in a big way.

Our price points are as low as 5-10 Rupees at times and go into even the opportunity of watching a standalone match if that's all you want. And that's particularly important in the case of sports fans because you don't want to make a commitment to an annual subscription just because you want to watch one match today. So breaking that price resistance for each match is something we've gone ahead with.

Another area which we are working with is that our core proposition can be for the core fans who are wanting a lot more huge experience on a few niche events but wide coverage since reaching to casual audiences is also important. I can't force a fan to download my app and go through a particular process just because he wants to watch half an hour of one particular football match. That's where widening through partnerships with even PL, the platforms like Tata Play, and Airtel etc., is an integral part of our offering. The more massive events can be made available across everyone. So that's pretty much been the approach that we at FanCode have taken, and it's, I believe, it is perhaps, the best way to go because completely in sync with this offering, content for free definitely doesn't seem



to be a sustainable proposition to us. Thank you.

Mr. Ramsai Panchapakesan: Thank you. In fact, I don't have any presentation because we day in and out we work on presentations, you know, burning our midnight oils, and we see slides more than we see our family members and friends. So that's how the whole advertising agencies ecosystem is all together. I just wanted to actually share my perspectives, what I have garnered from the market. That's what, as Mr. Harit said, it's actually inevitable that in India, it's a very traditional market unlike the European and the rest of the world. So we still follow certain ways of consuming content, certain ways of carrying ourselves, certain ways of protecting our culture, right? That's where we actually stand apart from the global arena. That's what it is. And second is we are one of the largest consumer economies. That's what actually gives us lots of strength for us to leverage the different opportunities that are actually available around us. And we create opportunity, we set examples for the rest of the world also. This one point which I completely agree with Mr. Harit is that he himself is one of the best examples that he has already set with the former Tata Sky, now it is Tata Play, with the complete advancement in technology and all because I'm one of the heavy consumers in terms of the consumption perspective as well as in terms of the advertising perspective.

So people say that the traditional medium is dying, the content is going or people are going towards the privacy content where people actually started adopting the small screen. But in this case, if that is the case today, we wouldn't have been having 60 million DTH households in the country and of which and that too again, it's not that there are not many new players who came and did any kind of disruption. The existing players themselves actually built this ecosystem so efficiently, which is only four players' market today that DTH market is and if I'm correct, around 35% of the complete market share is owned by Tata Play out here, of which close to 80% of the consumers are actually from the premium segment. That itself is foolproof for us to understand that how this paid content and the paid ecosystem is still prevalent and it will continue to stay prevalent, is what I hope I gave the numbers correct, Mr. Almost. That one second perspective is when we actually look at the content per se, what is it the brands actually keep the consumer at center, the consumers actually keep the content at the center, right? They chase content, brands chase consumers, and content actually chases the creative. So this is how this circle gets completed today.

If we talk about it, the year of 2023 was the biggest disruption in the country in terms of digital entertainment, as Mr. Harit mentioned, that complete cricket, which is one of the most premium sports in the country, went free, right? That's where the disruption of "free" actually started. It's not that it has started much before that also in the television ecosystem in the year of 2015, 2016, where we all used to have the availability of free-to-air television channels where this was actually catered with certain purpose. It was purpose-oriented where DD Freedish used to actually play a very pivotal role to reach out



the content to the remote villages and the rural parts of India, which actually constitute today close to 54 to 55% of the population and even the television viewing population that we actually cater upon. So coming to the entertainment sector, when we actually look at terms of the monetization, there are two ways of monetizing the content. One is that the content which is available in the archived manner. What again I take as a reference Mr. Nakal said that the television is actually broadcasted something that is actually resting in the place of the OTT platforms. That is actually for the residual content, right? And there is live content. The live content is nothing but all the live ecosystems and that actually completely works in a different methodology altogether.

So when we look at the live ecosystem, the live ecosystem gives us much, much more stickiness and in terms of the opportunity to monetize also and it is topical in nature because once you miss it, it never comes back and that's how it becomes obsolete, right? So that's where the live ecosystem has been made free to maximize the monetization through the content that was available when it was compared to a subscription because subscription, again, comes at a cost and there are multiple players actually operate in the same ecosystem and it becomes a very competitive game for them, for the platform owners to gain the momentum when we are starting at a fresh stage. That's where we start, you know, the free samples. So that's how it starts, right? Once the free samples actually hit a success node then we slowly, slowly, slowly convert the semi-monetization and then fully monetize. That's what has happened with even the cricket also and with cricket being a short break and it gives us a lot of opportunity for the advertisers to reach out to the audiences and for the platform owners to make huge money. Just to quote that it is close to broadcast alone and digital alone made close to some 2,400 to 2,500 crores in the last IPL alone. That's how the numbers are in terms of monetization.

Third is how this ecosystem works. I mean these two ecosystems are going to coexist forever. So why do we say this because we are actually, as I said that we are one of the growing economies as well as that we are still we do have a rural land which actually gets you know into an upgradation stage which is an urbanization which keeps happening, right? So there are advertisers. I still remember 20 years back when I used to do media planning, only a few people could afford cricket or the premium content on the broadcast. Only few advertisers could afford it because of the entry cost being so high in a digital ecosystem, the only advantage that actually comes to make the monetization in an incremental manner. When I say incremental manner, of course, the broadcast being the base pillar and you know the OTS and the other platforms being the incrementality to the content. So you can actually now start focusing on a certain specific market with a lesser entry cost that's where the aspirations of the local hyper brands have been fulfilled. They've also been actually able to sample the platforms and they've started taking the advantage of the platforms.

The only gray area that we all face is that in the broadcasting ecosystem, while there is a proper syndicated study, you know who you are reaching and how you are reaching and



the data is available even TRAI actually publishes the data for us, but the digital data is still in the evolving stage because all the digital data are only from the platform owners. That's where we have to take it with a pinch of salt, that this is how the ecosystem is currently working. The last but not the least is when we look into the complete consumption and the video advertising pipeline, I'm sure we are all aware that our advertising industry today is close to some 98,000 to 1,10,000 CR.

That's the number. There are various numbers floating. I've just quoted the in-between middle range number, of which the digital video alone actually commands close to, in terms of monetization, is 12,000 to 13,000 crores. That's what is actually an extension of the broadcast world. Because it's a video, that's what we call a second screen, right? When we are watching a primary screen, still the OTTs are called a second screen only. It is not a primary screen. But having said this, the second screen actually gives that the incrementality and it has actually given the complete way to reach hyper-local in nature with the regionalization of the content. And the content creators have actually started monetizing through, I mean YouTube. What we actually see is that there are so many influencers who actually make a lot of money through YouTube. That's the way that monetization is actually growing, going in the content space.

So eventually, content exists to entertain, engage, and then get evaluated. Content gives us an opportunity to entertain. Content gives us a clutter-breaking environment. And especially in an ecosystem like live content. Now I don't know how many of you have watched news channels on the day of the Ram Mandir inauguration right, Aayodhya Mandir. You would have seen that no part of the screen would have been left blank. That's how the content, you know, is getting monetized in today's arena. Every pixel is paid in the content ecosystem. So I think it's a way to go and to develop this OTT content with original content.

So one follow-up question, which is, what are you seeing are the advertising trends in terms of rates, television versus OTT? And I think the fair way to look at it would be CPM, right? So that you can evaluate because I think TV reach is still far larger than OTT reach. See, I, in fact, so from an industry point of view, I have been abiding by certain guidelines I have to follow. If you ask me from a personal opinion, it's all that wherever there is a content, there you have a consumer, and it is actually the CPRP, cost per rating point is what the CPRP is by the way. For people's reference here, every rating point is, as a concurrence, what the concurrence has been. There is a certain amount of concurrency that the viewership comes from, that concurrency is averaged out to a certain period which is half an hour.

So these numbers are just to have check measures so that people can make unbiased decisions. So somebody has to have evidential proof, right? That's where the CPRP and cost per melee, which is every 1000 Impressions which you buy on the digital ecosystem, are all actually to take a decision with a certain aided number that is being floated or available through certain syndicated studies That's how it is, otherwise now it's all



quality-driven, content-driven, and it is again people-driven, which is consumer-driven. So that's how the world is going right? Thanks.

Alok Agrawal : Harit, you wanted to add some?

Harit Nagpal: Yeah, I just want to add on the SVoD and AVoD data whole lot of data that's been floated around that there are lots of award customers we established that almost 90% of content that's available on a ward in India today is actually something that got published last night on S or pay TV and is published on the other side U data that says that the pay TV industry has two streams of revenue, one of subscription and one of advertising. Both these put together are in the realm of about 65 to 70,000 crores. That on a 500 million reach on 110 million households amounts to 126 crore revenue per million people reached. Again, when you go to AVoD which is 90% of the same content being shown as award content and monetized, the monetization of that subscription is zero and whatever monetization you're doing by way of advertising that amounts to four to 5 crore rupees per million heads reached, right? That's now, so therefore the same broadcaster who's monetizing his content on pay TV for 126 crore rupees per million heads reached is okay to move that content on AVoD for free for a monetizing ability of 4 crores per million house heads and he's watching those heads slowly move from pay TV to AVoD he's actually losing 122 crore rupees per million people who move from one side to the other. I leave it open to the house to figure out when the penny will drop for the broadcasters. That's all I'm saying.

**Pankaj Krishna :** I'm not answering that but I'm just adding to what you are saying in my view AVoD is current. I completely agree with the numbers har and I think it's a brilliant way of putting the monetization on in terms of heads per million the only thing is AVoD seems to be flying because unfortunately everyone wants everything for free that's all it is and whether it's the right way to go or not I think time only will tell.

**Alok Agrawal :** But the one other trend is that even in subscriptions, people are showing advertising which is really annoying you know so that makes the subscription free subscription.

**Harit Nagpal:** Sorry, but then the subscription is cheap if you were not putting advertising the subscription would have been much more expensive. The same thing will become double the price. We had a TRA experiment 4 years ago where we just increased the price of the lower end of subscriptions by 50%

Pankaj Krishna: what is the impact on subscriptions?



Harit Nagpal: 40% Churn.

**K Prasana:** If I can just add to that particular last point. In the last year in one of the cricket series that we did, The India tour of West Indies, we actually offered consumers an option of taking an ad-free option at an extra 25 rupees per subscription. 6% of people opted for it.

**Harit Nagpal:** We give them both the choices we give them option A and option B. I've got enough satellite capacity I've got a spare satellite today I've got 300 Channel capacity today extra. I've been dying to put together an ad-free Channel by just charging you know 20 rupees channel for 25 rupees no takers, no takers.

Thank you.







## SPECIAL ADDRESS

Mr. Devusinh Jesingbhai Chauhan, Minister of State for Communication, Govt. of India





# **SESSION-9**

## Animation, VFX, Comic and Gaming

#### **SESSION CHAIR**

Armstrong Pame, IAS Director, Ministry of Information & Broadcasting, Gol



Mr. Armstrong Pame is an officer of the Indian Administrative Service (IAS) of 2009 batch belonging to the Manipur cadre. Presently, he is serving as a Director, in the Ministry of Information & Broadcasting, Government of India. Armstrong Pame is a recipient of several awards including India's Most Eminent IAS Officer Award 2015 and India's distinguished IAS Officers Award 2021. Armstrong Pame is a Physics (Hons.) graduate from St. Stephen's College, Delhi University and had also completed the Transformational Leadership Course from Oxford University and Leadership in 21st Century Executive Education Module from Harvard Kennedy School. He is also a Young Global leader of Class of 2018 declared by World Economic Forum.

> **Ashish Kulkarni** Chairman, Animation, Visual Effects, Gaming and Comics, FICCI



Ashish S. Kulkarni is Chairman of FICCI for Animation, Visual Effects, Gaming and Comics Forum and Chairman of MCCIA Animation & Gaming committee. He has set up worldclass animation studios in India and created the finest original Indian animated content, such as his magnum opus Little Krishna (2009) and Shaktiman (2011). Ashish is a science graduate with Diplomas in Marketing & Sales Management, and Public Relations, Ashish worked with several companies finally becoming CEO of Reliance Animation and AIMS. As CEO he took Reliance Animation to the global arena while carving a niche as the finest Indian animation studio for original IP creation. Soon after he launched his own concern Punnaryug Creations.



**Anirudh Ghosh** Senior Manager, Whiteways, Singapore



Aniruddha Ghosh has 16 years in the Broadcast Industry, especially in System Integration. Mr. Ghosh has developed an expertise over a vast range of technologies, and has lead projects with ranging complexity as well as across different geographical locations such as the South-east Asia, South Asia and Middle East . Presently, Mr. Ghosh is a Senior Manager for Whiteways. Whiteways is a System integration company headquartered in Singapore, providing services as Consultancy and Solution sales for television, Radio, New Media.

> **Satyakashi Bhargava** Director, Bhargava Pictures



Mr. Bhargava is a civil engineer by education, a film producer by passion, a Screenwriter-Director by profession and an ardent Ramayana speaker & writer by devotion. With an experience of 25 Years, Mr. Bhargava has been engaged in film production as a producer, director, screenwriter in Animation and has recieved the covetous National Film Award -The Golden Lotus (Swarna Kamal) for the first ever animation feature film in the history of Telugu cinema "Kittu". He is also the author for the best-selling kids' cinema novel "Maharaja", a Lyricist & a poet. His recent documentary series "Rama Ayodhya" is soon to be released on a digital platform.

> **Bharavi Kodavanti** CEO and Animation Head, MARA Creations Pvt. Ltd.



Mr. Kodavanti currently spearheads the operations and strategy as CEO at Mara creations Pvt Ltd. He is also the co -Author of the "Maharaja" Kids novel and is engaged as an Executive Producer for a couple of forthcoming Live action features & Docuseries. Mara Creations Pvt Ltd is an initiative with an objective to create content for kids and young teens (both live and animation) that is culturally relevant, deep rooted and connected to the ethos of India, enriching and entertaining.



## Animation, VFX, Comic and Gaming

### **SESSION CHAIR**

**Armstrong Pame:** I just want to share for two minutes the visions of the ministry because as a director in the ministry looking after this theme and having read and, you know, brought out together with the Task Force member, the AVG task force. AVG today is still a rich of the few because of the cost of the software, the cost of the laptops that people have to use, the cost of the training that people have to undergo, it is still very expensive, and it's still a play of the few. Even myself, though I've been in the service for the last 15 years now, for the first 13 and a half or 14 years I had heard of this field, and I was never so interested in watching animation movies and others because we were quite ignorant of this. I've been working in my state of Manipur only, having come to this ministry, I started seeing the vast potential that this field can give to solve the country's problems and take the country forward. As a civil servant, my job is to take the country forward in whatever field that is given to me, earn revenues for our economy, and provide employment to our youths. The AVGC sector today has one of the best potentials to provide this, and amid all of this opportunity, by 2025 India looks forward to becoming at least a \$40 billion industry. We are less than \$3 billion today. Why are we so confident in this field? Because we have talented manpower who are experts in this field. With this vision, our ministry is leaving no stone unturned. We're trying to come up with a national policy. We've been helping various state governments in trying to come up with their state policies. So this afternoon, we will share with all of you, starting from the panel members, what is your broad perspective? What is the vision that you have? And what do you think of the future of this AVG sector in this country? We will first like to hear from Ashish Ji, thank you.

**Ashish Kulkarni:** Thank you very much, Armstrong sir. It's always been a great pleasure working with the INB Ministry since 1996. I'm from the advertising and the media background, and having served there for 15 years, I decided to get into animation in 1996-97, and I was amongst the first three people in India who got into animation in 200. When I was looking at the statistics because I was trained into media planning and media buying, I realized that this industry can actually grow really big, but nowhere in the world, this industry was, you know, considered to be as a volumetric, a kind of a collaboration of different skills and they were all working in isolation.

So in 2000, when I was the CEO of Jadu Works in Bangalore, I coined a word called AVGC, animation visual effects gaming, and comics. In 2019, we added XR to it, and that's when in FICCI we started with AVGC Forum in 2000, and ever since I've been sharing that, and we have led in building this industry in a very big way. To give you a very broad highlights



of the industry today, we are closer to around 2 lakh 65,000 directly employed trained professionals in our animation gaming visual effects comics and XR industry. By 2032, we will require 22 lakh trained professionals. One of the biggest handicaps we had of scalability was having no marks for Creative Arts, performing arts, and design in the school curriculum and not having many universities having creative programs which would actually lead to these careers.

Many people by mistake thought that learning computers is learning animation or visual effects. It's about learning the creative art and form. So if you really look at the Fine Arts, the Fine Arts teaches us how to make a great caricature. The science and grammar of animation storytelling is how to move that caricature into the right proportion, in the right timing with right expressions. So, you know, we needed to really create curriculums which would actually take people from the basic foundation to the next level because it requires a direct skill mapping. If you are an actor, you can become an animator. If you are a dancer, you can become a rigging artist. If you're a painter, you can become a texturing artist. If you are a sculptor, you can become a modeler. So there is a direct mapping of a traditional skill into a digital skill, and that became very difficult.

So we started going to all the traditional art forms in India to Channapatna, Ram Nagar, Mahabalipuram, and all and pick up artists from there and start training them. And then went to all the art schools to start these programs, but we had a lot of residents. The National Education Policy 2020 actually came in as a big savior because from the sixth grade onwards, the kids can take creative arts, performing arts, design, and sports. And then the universities also today are open to starting creative programs in a very different way more so that most of the universities have arts separate and science separate, and when it comes to arts it's restricted to literature, the language, economics, philosophy, and psychology. It's not talking about creative arts, performing arts in most cases.

There are very, very few niche universities where it was. And when we realize that if you catch on to this artist at an early age, then you can actually groom them to be legends. But today the requirement of the world is that we need to have arts and sciences to work together because it's a combination of art and science because the delivery, as Sir said, is into the digital platform and the digital content ecosystem, which we will talk to you in the second round of our discussion and show you the scope as to where the industry is really growing.

To tell you frankly today in the total scheme of the media entertainment Universe, AVGc XR is closer to 30% of the universe and gaming industry is around 15% of the universe because the gaming industry has a b2c application and they do extremely well. But in the next 10 years in India, where we are going to go, more than 50% of the total size of media and entertainment will be consumed by AVGc XR and the gaming industry will be



the single largest vertical bigger than film, bigger than television and bigger than even the events industry.

And that's why the kind of Engagement we have, we presently have 600 million active smartphone users and they are all consuming games and they are actually playing games on their mobile phones. In the next couple of years, we'll have 900 million active smartphone users and that's a big access to the content. There are three Vs which are ruling the world right now, one is the voice, one is the vernacular, and one is the video. Now if you talk about how do we create this content in the digital content economy and supporting that content, it will be the people who are making careers and building this because for anything and everything you turn to the digital ecosystem today and that digital ecosystem earlier we used to read whatever was there on the digital ecosystem but today we want to watch videos. Now how do you create those videos is where the job creation of Storytelling is going to really happen and that's why the skills of Animation, visual effects, gaming, and comics become very handy because those are the first formative founding storytelling grammar Foundation that puts the story into a visual form in a very systematic way in a storybot form in in terms of comics and then converting that into action into animation. Then when you want to do a larger than life experience that's where the visual effects come in and that's why the evolution of Storytelling is phenomenally big whether you are making an ad film documentary film or corporate film or otd film or television film or even the feature film whatever film you make today V visual effects is inevitable we touch more than 80 to 90% of the scenes and we correct them and make it visually appealing so every frame counts today and you make it more beautiful and that's where these skills are required and I think the support that we have from information and broadcasting Ministry to form the policy and so much so that we as an industry have realize that many states in India who wanted to become the film States who could not become a film-making state can definitely deliver animation visual effects from those States and that's when we started working with Armstrong sir and all the team at I&B Ministry. 22 States came forward last April when the workshop was done in Mumbai after the task force report and today we have 11 states who are going to have the policy by 31st March 2024 five states already have the running policy and it's a very successful policy in Maharashtra, Telangana, Goa, Karnataka and West Bengal. iN the states of Kerala, Tamil Nadu, UP, Haryana and Rajasthan, the drafts are already submitted and they are in the process, they are in the cabinet approval in some places and we will be having these policies as well and then we have Orisa and then we're going to look at the Northeast as well. So I think it's a very encouraging thing that the creative Talent in every state, wherever they are, can be trained into those States and they can start delivering animation gaming visual effects Comics if they have internet connectivity and that's a great cottage industry in the rise today as far as India is concerned and when it comes to the size and the other opportunities sir, I'll come in the second half.



**Anirudh Ghosh:** Hello everyone, and thank you, Mr. Armstrong, for this. Actually, it's a little bit different than what we do. As we said, we are a system integrator company, so we do more on how televisions and radio perform. But if you see the previous conversations which happened last time, we were talking about content and then we're talking about how to retain the audience for the content. So, that becomes very crucial because every time we are getting fluctuated from different attention. So, attention becomes the currency.

Here, we're talking about how Mr. Ashish also mentioned that there is something which is creativity as well as something where we are concerned about the digital economy. So, as this is more on animation and all that, I have presentations, so let's see what the video is talking about rather than sticking to words. Just a minute, thank you so much.

Okay, so yeah, we are from White Ways, and this is actually the main important thing everyone is talking about in different statements: that content is king or it's the digital attention, whatever you talk about. So, we have two things which we prefer to do: one is the attention, now how we are getting the attention to be retained. One is creativity, another thing is the infrastructure behind that, how to create that so that the same content which comes in lots of TV channels or other social media rather than that you feel to follow some particular channels. There is, in the public as well as the private TV channels, this thing in mind that the graphics, the visual effect is giving much more importance than how the anchor is going to give the text.

So, here we have one small video. This video actually we clicked from our director's home. Let's see what he's talking about. [Music plays]

So, it gives the indoor view as well as the outside view of nature. It's probably in the morning, light is still on. There's a place for the outdoors as well.

Time flies. It's very detailed. Now, the evening, the sunset, the light is changing as well, there's much detailing, its shadow getting changed. Actually, we came in the same corner, but it looks completely different now.

So, yeah, when I saw it for the first time and someone was showing me the flat, I thought it was real, but it's not. It's completely made in animation and how things are getting changed. So actually, when we are presenting something with this format, if it is an election news from the parliament or if it is a football from the ground itself, it gives a completely different attention to the audience, as well as it's related to the digital economy. Exactly, the attention has been given to the money revenue. So, this is the interest coming on, and there were lots of challenges which were there before, where the rendering times and when you're creating the content for particular different news, it takes a lot, but now it's coming in the real time rendering happening.



I will show the second video. There are lots more videos actually, you have to be a little bit patient with me. So, here we'll see how the green screen and an actual screen are giving effect, so the shooting is happening in the green screen, at the same time I can see that the output. So, you don't have to wait for the rendering for the whole day and then come in the final one.

Okay, so and how Mr. Ashish also talked about this is the XR, XR Studios coming on, this is how we are planning when we are planning for the studio setup and all that. So earlier, when there is a video wall, we have to have a 50 video wall, and that studio is completely occupied which is a huge amount of money as well. Here, the same Studio you can use for multiple purposes. Sorry, I'm going a little faster on this, the technology, I'm not going into more details here.

You can see that when you are doing some shooting as well, you can see the same thing on the teleprompter. Earlier, the people who were going to do the shoot, they didn't have an idea of the final output, how it looks, but now when you are getting the capture itself, you can see what the final output will come out. If anything is wrong, you can change right away. This is how it's related to the broadcast industry when we are presenting our news or our program. So no video wall, but it has a video wall. You don't have the lights to be bought; you can create the lights there. That's all. Hopefully, it's finished on time. Thank you.

**Satya Kashi Bhargava:** First of all, Thank you very much, ji, for giving me this opportunity. Honestly, as a creative person, I don't know the statistics or business equations that you are all projecting, but my point of view is, for any country or society, media and entertainment as a whole are either ears or eyes for any society. Either ear or eye is media entertainment as a whole, and this animation, visual effects, gaming, and comics, these are all tools to add to our vision or our hearing. So, I mostly concentrate on content creation. In Bharat, we have 140 crore people. So, these are all, for example, if we consider, these are all our customers or our audience. And especially for animation and gaming, 90% of the business comes from the next generation, that is children. And out of 140 crores of Indians, there are approximately 35 to 40 crore kids who are there as our customers for this animation industry and everything. So, what can be done from our side as responsible creative people or business people who will give you a presentation? My CEO will follow it up with the presentation.

**Bharavi Kodavanti:** Good afternoon, everyone. So, the topic we're addressing today is animation, VFX, comics, and gaming, specifically in relation to Bharat. The statement is clear: we are a nation with 40 crore children who are below the age of 15, which means nearly one-third of the population. Of course, of late, animation is not just confined to kids, but the majority, at least I, have grown up watching animation series from Disney



and Pixar, and all that stuff. It's been, I think, more than 30 odd years, and still, we are watching the same content just because they are timeless. So, these 40 crore children are definitely animation customers, or for that matter, VFX and gaming as well. This is very huge; I think probably 30 or 40% with the rest of the world put together. So, it's a big statement. We have a huge base of audience who are ready to consume quality animation content, and in fact, we have been consuming so.

Coming to Bharat, so what to watch? I have an 11-year-old kid who watches right from Chhota Bheem to Krishna to Ganesha to Doraemon and so on and so forth. But what comes to my mind every time is only a handful of Indian animation stories are being told or brands are built. If you take the case of films, nearly a thousand films are made every year in all languages in India. So can any one of you have any idea how many belong to this particular genre, like the ones catered to kids below 15 years? At least can you remember what is the last film that you have seen along with your grandchildren or children that is from Indian producers and directors? We don't remember because there are hardly any. Even if somebody has made it, they fail to see the light. They can't be released. We have to evaluate the reasons, but this is a hard truth. There are a thousand films that are being made every year in all languages in India, and not even five films belong to these 40 crore children of Bharat. So, that is a very sad state of affairs. Why the producers, especially I come from the land of Telugu, and people have seen what kind of budgets we have with the advent of Bahubali and Tripala and all; we spend money like anything on films. But even in our industry also, we don't have any films related to kids. So why? Why are we not focusing on that category?

There are two aspects to it. Upbringing is our responsibility as the citizens of India, the future citizens of India. We have to give the right inputs. We feel right to right entertainment is the birthright of the kids. Right to right entertainment. So, what are we giving? What are we feeding? The endless YouTube, people talk about data, and people talk about a lot of technology. Kids beyond 10 years are exposed to all kinds of content, but why aren't we producing the right content? We have the market. We have the base. We have the people to watch, kids or not just kids, but with the families. That means if you make a good film, it can probably beat all the records. But still, we have already seen the Lion Kings from the Lion Kings and all. I mean, how much they grossed and all. But here, India, with the people who go crazy about films, we couldn't make any films in this genre, in this segment. So, this is the story, except for a few success stories. There are hardly any big brands, big franchises that are created in the last two decades. At least I have been in the industry for the last two decades, and I hardly recollect at least three or four big franchises that have been built by the Indian producers, Indian animation studios. Majority of the studios are just confining themselves as outsourcing partners. They do the job. All the creative jobs are done elsewhere, and we are like a service sector.



We have to move from this. The policy should come in such a way that it should encourage the Indian studios, Indian producers to be the creators, story creators, brand creators, character creators. There are two aspects to it. One, it is a huge business because there is a 40 crore base there. Number two, it is our responsibility. We talk daily, we talk about Atma Nirbhar Bharat and the Vishwa Guru. How will it become? How can India become Vishwa Guru if the kids are not being fed properly? So, we have to give the right content to them. We have the stories. We are the land of stories. We can create stories for the next thousand years, only if we can encourage the studios, the producers, the directors, the creators in that way. So, there should be a proper synergy between the industry, the creators, the audience, and the government. Then probably it's very obvious because we have been creating, we have been producing almost on an average, a thousand films every year. Can't we produce at least 10 kids films? That is a big question we have to ask ourselves. Why aren't we producing?

So, what are the problems? There are bright pictures as well. But before that, what are the shortfalls? The lack of original content. So, we have seen Chhota Bheem, what it has created in the last 10 or 15 years. We have seen Krishna, we have seen Ganesha. Of course, many people say, why do Indians create the stories from Ramayana and Mahabharata? Don't they have other things as well? See, for the rest of the world, maybe they have to create the stories, but we already have the stories in this land, which are enough for the next thousand years. Only thing is, we have to rediscover that. So, we have to encourage the creators in that way. And then the style of the animation and the technique. So, most often I wonder, even our characters, like, for example, any local character, if we create a local character, most of the time the eyes and the body look like some Western, because most of the animation technology has been imported from the West. And the body language also, when we talk, we talk straight. We cannot do this. Suppose if we are coming up with a character of Krishna, that Krishna cannot say this. So, these are the simple things. So, we have to have our own originality in terms of storytelling, in terms of style of animation, in terms of characters, and everything, in terms of backgrounds as well.

And the third important point is the failure to understand what exactly the kids want. I have personally heard many of the broadcasters saying that no this won't go well with the kids. We are from this part of the land; we feed the children what is good for them but not what they ask. My son always asks for a chocolate or a biscuit, but I won't give. I give what is good for them. So we have to create content that is relevant and culturally rich, deeprooted, inspired from the ethos of this land. And of course, it should be entertaining and enriching. So we have to identify these points.

And then comes the funding part of animation. You need very deep pockets for animation. So the funding is very important. I think it has to be worked out properly because not many producers come forward to fund kids' animation stuff. So we need to create a mechanism



where any aspiring creators can approach and create that and approach them and make it happen because this is the need of the hour and marketing and outreach and all. I think now we have started marketing our products very well. I think it shouldn't be a problem.

And then the broadcast, we hardly have three or four channels. The fanciest thing I can ask you is like if the government, if the national broadcaster comes up with one or two kids channels, that's nothing like it. Because elsewhere across the world, we have seen this trend. Because it's not just about creating content and engaging the kids, but it is setting up a cultural root and what we want to give it to the next generation, the future citizens because for that at least it will be really good if the national broadcaster comes up with kids channels at least one or two in different segments that that's what we propose.

And on the other hand, the bright picture, this is the character of Rama, which we are working on. This is a show called Sriman Rama, which is about the childhood engagements of Rama. We have seen Chhota Bheem in child format, we have seen Krishna, and we have seen Ganesha, we have seen Shiva but not yet Rama. This is the year of Rama so we are bringing this, these are the stories inspired from Ramayana. So that is what the bright picture is so we should consider the good stories for that.

So as I said culturally relevant inspiring and enriching the other part is the skill development of the of the guys because we've been working on working closely with many animators and all what we closely observe is the lacking in the originality to create the characters because the outside content is very much, you know we call it inspiration but often it ends up copying only. So we have to, our training centers and our curriculum should encourage in creating original pieces and like the new education policy I think I just came to know that the government is encouraging the creative arts from the great six so it's really good.

So this is finally our poster of Sriman Rama which is soon to be released. It is a 108 episode series on the childhood of Rama. So I hope the people here can work on the things that we have identified seriously. We've been working out on these points. I I seriously because India is a land that can give huge opportunity for animation VFX and gaming for that matter even gaming also we need to have our own style because lot of explicit games are because most of the time I hear from the parents and the school because i' we've been closely associated many schools most of the school people also tell that people are kids are engaged in explicit games and all so many people have asked me can't you create a game based on something really good so so if we can cover up all these aspects I think it'll be a bright future thank you very much the BES

**Armstrong Pame:** Thank you, Mr. Bharavi. It's very encouraging to see that you're focused on creating India's IP, the original stories of India.



**Bharavi Kodavanti:** Yes, the Ministry has been discussing and focusing a lot on this point. India is still seen as a service industry in this sector. In fact, I think I will not be mistaken if I say still 90% plus of the revenue made in this AVGC sector comes from the services revenue.

**Armstrong Pame:** We would really like to have Miss Taruni Agarwal with us this afternoon, but I think there was some communication gap, so she says she will not be able to make it. I have been interacting with her for the last one and a half years. She is someone who is keen to only do original IP. She has produced the Hanuman Chalisa Series in 2013. Her show is running now, "The Legends of Hanuman" on Disney Hotstar. We thought we would have her here this afternoon, but a story like hers, the creation stories, the creators like her, we would try to encourage more. Though the national policy is yet to have the cabinet approval as of today, and the National Center of Animation of Excellence for animation, visual effects, gaming, and comics, which is being planned to come up in Bombay, the Film City, will have 100 Crore rupees dedicated for innovation and research. So, those are in the pipeline, and I believe we will be able to see lots of India's IP creation coming up in the next few months or years from today.

And, of course, your question on, out of thousands of movies – in fact, the CBFC under my ministry certifies about 7,000 movies, films in a year, including the documentaries – and you are absolutely right. Can we name about at least 100 of them coming out for the children's films? We have very few. So, I think it opens up a big market because we have 40 plus crores willing to consume that market. And, in fact, many people also ask us, why are the Indian creators only creating children's movies related only to religious perspectives? Why can't you have superheroes and others? Well, I'm not a creator myself, but we would also like to encourage people to create many more things which are universally acceptable. And, in fact, during the last year, the film bazaar, we came across one series called "Return of the Jungle". So, I think it will soon come out in the market. So, it's a wonderfully made series. So, we also need many more series, many more films which can universally be accepted. We also encourage those creators.

So, Mr. Ashish also has something to answer on this.

**Ashish Kulkarni:** Yeah, so let me clarify some of these doubts. In fact, I was the first one to start original Indian animation with Little Krishna. Then I created Shaktimaan, Big Bees, Little Singham, Goljunr, and many others. And I started a 100% Indian original content company after servicing Disney, Warner Brother, Dream Works, Sony for 8 to 9 years. It was difficult to get their work, but then I decided, learning from all the aspects, that we should create Indian content for the global audience. There are a lot of challenges. First of all, all the Indian, you know, kids channels you are from the pay TV, and when you go to them, they keep all the rights under the sun, and they give you 18 lakh Rupees to 23 lakh



rupees for the whole production, and including that, they keep the IP also. So, you have to work in reverse, and that's why the quality of animation will never grow. The reason why we do, you call it mythology or religion, I call it heritage content, is because if you look at any of the content done by Pixar, Disney, or DreamWorks or Paramount, they spent 200 to 300 to \$500 million making it. And they spent \$700 million in marketing it. You don't have this kind of access or budget in India. The filmmakers don't understand anything beyond a hero. If the hero is there, everything works. If the hero is not there, they don't know what to do, how to market, what to do, where to place. And that's why we all made films, feature films for kids, in 143 countries. Animation is known to be kids content, including India. US took 73 years to move from the kids genre to the family entertainment genre. Japan took 76 years to move from kids to the family entertainment genre. We are still doing better. We are only about 23, 24 years old. And we are servicing the world. We are still making money, and we are also making IP in a very big way. The numbers you showed are nowhere. We have made a huge amount of Indian content. And not only our content, we have created a huge plethora of other content like Motu Patlu, Shiva, you, I can name at least 100 titles right now. Krish and Buddy Boy. And we are doing extremely well on Netflix and the rest of the ecosystem. Where we require support is that we don't want to sell our content to the broadcasters. That's making the producer very poor. So, we asked the government to put the content reservation like many countries do. When you get a kid channel license, you put a content reservation that 80% content has to be locally produced. And that's how you create the and maintain the ethos and the culture of the country. Because the kids will not come and tell you, show me this. You have to be responsible in showing the right content to the kids. In the absence of that, the content like Shin Chan and all, which is an adult content in many other countries, was dubbed in local languages and shown to the kids. And that's not the right thing. And that's why we always created, all Indian studios created, very responsible content and with the right language. Even the language is very important because the kids pick up from the character language very strongly. Our request to the government for ages since 2011 was to create DD kids because if we have a partnership with a public broadcaster like BBC or PBS or CNC, in many countries, the handholding there can actually create wonders. And that's where the huge content can be created in India. And when I talk about this, the man who was in charge also walks in and he was working with us on DD kids also. He's in the next panel. But the issue is we need to take these few bold steps and support the Indian creators. Because the kids, the foundation which was laid by grandparents when we were kids and they told us these wonderful stories on which we built our foundation today. The grandparents are missing and the kids' grandparents today are Cartoon Network, Pogo, and various channels. If we don't tell the right stories through those channels, then the kids will grow up to be very different. Although the kids born after 2000 are global citizens. But even when they are global citizens, the owners is that they should know the Indian art and culture and the Indian ethos and Indian way of life, which is actually been The Indian art and culture, and the Indian ethos and Indian way of life, which uh, is actually been taught to them through



the stories and the Moral Stories. And I think in that direction, the ministry is very, very focused, and they have listened to several stakeholders, and we are working on certain things which would actually be there, but the industry will also have to take an onus that we need to graduate from kids genre to family entertainment JRE to get more audience. As of today, in the total broadcasting Universe, the kids segment is just around 9% of the total viewership, and the revenue that we get is 4.5% of the total universe. And that's why there is a deficit there in the broadcasting. We need to figure out how to fill this deficit so that we make it more viable to create animation content.

**Armstrong Pame:** Before, we have about 15 minutes left. This will be our last discussion, the last point from the panel from each one of us: what have been your most difficult challenges in your journey so far, and what would be your biggest contribution so that you know you can contribute back to enhancing the visibility of this AVGC sector in the entire country for India and the globe? Yeah, starting with you, Mr. Kodavanti.

Bharavi Kodavanti: So, the biggest challenge is the funding part. The first aspect is the funding part, and the second aspect is getting the right place to place it. These are the two major events. In 2006, we made an animation feature film. He was a producer and I was the director for a film called Kitu, which happens to be the first-ever animation feature film in the 75 years history of Telugu Cinema. So we just out of passion, we just made it, but it took almost 4 years for us just to release it. The reason is very surprising when we wanted to release the film. The concerned authorities, the film chamber, said, do we have to censor this? So they don't know whether we have to censor it or not because they don't have any idea whether it is a film or not. So by then, it's been almost 3 years that we spent on making the film, and we were almost exhausted, and when we wanted to release, we've got this question. So, okay, fine, we told them that yes, this is a film and this needs to be censored. After all, this is for the children. So there are no rules as such in the government that an animation film needs censorship. So what we did was, we went to the then chief minister, Rajakar R because we've got a connection, and we've asked him that we wanted to do this. He helped us in getting the film released, and it took the next two or three months to get this done, and then they did censor it and then we released it. Okay, that's one part is over, the second part is a way to place it after the theatrical release. We wanted to go for a satellite but no one even knew that an animation film can also be taken to the satellite, so in the end and we ended up making peanuts out of this almost three or four years work done so that is these two are the biggest challenge, one thing to get it financed is a big very big task you hardly have any, and and the second thing is to get the right place, uh, to telecast so these are the two things.

Armstrong Pame: Yeah, Mr. Satya Kashi you have something to say.

Satya Kashi Bhargava: So, for us also, the main problem is finance, and the second



part you are asking about original contributions from our side. As a writer, I have already written some original Indian content which we have initially published as a book named Maharaja. It's almost it's a bestseller in almost more than 500 schools in Andhra Pradesh in both Andhra Pradesh and at present already been converted approximately one lakh books no, is it already been converted into film no, no, not film before that we thought film is as as we are facing a problem so we are, uh, in a mood to write stories and then publish it. Publishing is easy for us at least financially so we are trying to pitch to various things and the present IP I have created is Sriman Rama is a balarama. Adventures of childhood Rama so as you said Rama we are not saying it's religious Rama is our history Rama is our heritage and Rama is an ideal for all human beings in respect of caste Creed and so that's our point. So what are the good qualities we can learn from Rama as a every kid wants a companion who is a super Rama is a superhero kind of thing we are making a almost 108 half an hour episodes and we are, uh, in talks with the national broadcast Duran only so first we want to, uh, start from there only so it's, uh, Maybe in the coming years. I cannot commit but one of the visions of the national AVGC policy is to introduce a DD kids channel. So it's very much in our short-term vision, which should be done in the first one year of the policy being approved.. That will be very great but I cannot give you assurance but that is still being considered, yes, okay.

Armstrong Pame: Ashish, your last thoughts?

Ashish Kulkarni: Well, I think the most challenging thing that I see in my life is to release an animated film. And the second challenging thing is to retain rights to the shows that we have created. So these are the two major challenges faced by the industry. Also, what I would like to do to better the future of animation, gaming, visual effects, and comics is to really see that we have a conducive regulation in the gaming industry. Because that's something which is pending at this point in time. And I think that's where we can build a big ecosystem and a big revenue stream as well as an industry in India. Because we have the largest number of users. And second thing is that I would like to help the policymakers to actually bring in the right co-production mechanism and also the right mechanism. Because people are talking about DD kids but we are already into a streaming era right now. So how do we really make the futuristic way of helping Indian studios make this content and make it global? Because India has a potential to have this content globally going not only for India but to be aired or to be streamed globally. So I think we need to sit together, brainstorm and make a conducive, a win-win situation for the creators in India and also this because in the next 10 years we believe that India would be amongst the top three content creators as far as AVG CXR is concerned. Thank you.

Armstrong Pame: Mr. Ghosh, what's your take on the two points which we just discussed?



**Anirudh Ghosh:** So, if you're talking about what the challenges are, then yes, the challenges are attentiona and viewership because we all know from television how much the viewership was there before. It's declining, it's going on different platforms. So, it's challenging not only for us who provide the service for the national televisions but all public televisions as well. How do you retain your audience? Now we have lots of different platforms and the style of viewing has also changed. Earlier there was one television and everyone in the locality everyone was watching the same thing. From there it came to the family. Now it's different, someone is watching something on the iPad, someone is watching television, someone is on the internet, somewhere else. So how you're going to produce for everyone and how will viewership be retained? That's the challenge. Whereas the advantage which we have, we are in the stage of the technology where the technology is changing massively and it's for our needs.

So you can see how technology is coming along. So the virtual is coming in the television, the augmented reality is coming, XR is coming. So there is lots of merging is happening, the data is coming so much so that you can make which there is a financial news which will be much more interesting to watch rather than how it was just a presentation of the data. So those things are the advantage for the technology and hopefully we will cover up this part. Thank you so much. In conclusion, I want to draw a few points from what the vision of the ministry looks like and want to see how India grows up in this. See in India, you have about two CR people or even more coming out of poverty every year. I was discussing the same thing with the Adobe team yesterday when these two CR people come out of poverty, they have a certain amount of money as disposable incomes to spend in India. This disposable income is spent on entertainment.

The concept of entertainment in India is viewing the TV together, going for a movie, you know, not going for a long vacation of one week, two weeks to see our to the entertainment section of this about two CR people addition every year. As Aisi has just pointed out, you need people who can create those entertainments. By 2025 onward, India will need about 2 lakh people every year for the next 10 years in this ABC sectors and hence this has a huge potential. Let us focus on how to bring this and this sector. Many people are confused with the IT sector. To be good in this animation sector, visual effects ET, you have to be an engineer. No, that is not correct. On November 3rd, at the India Joy even in Hyderabad in October, right November, in November, I met one Mr. Prem from Nashik who used to design pottery basic education. He used to earn three lakh rupees for the whole year. However, because of his skill, he got recruited by one of the biggest gaming company.

Now he makes three lakh three and a half lakhs a month. He has no engineering background, he has no other technical backgrounds, just that he is skillful in pottery design. Indians everywhere, in every part of the world, in every part of the country, be it, you know, from the smallest village to the block level, to the headquarter level, to the, we



have immense talents. And I think this ABCC sector, if we take it in the right direction, we are heading towards becoming number one in the world. Let's look forward to that. Thank you everyone. Should we take, we still have three minutes, so you have, yeah, three minutes. I want to stick to time. We look forward to one or two questions. Yes, exactly. They don't understand what is animation. We can't finance innovative finance, finance qualification, track record. Everything is okay, but they are not financing National B, really agreed. Sir, I got your point. This is one of the policy points because many of the financial institutions refuse to do funding in this sector. So once the national policy is approved, the mechanism to activate this national policy will be the ABGC mission. Under this mission, we will have people from the Ministry of Finance, people from the banks to look into this so that this becomes like any other activity, like deep hole industry setup. You have finance available like that under this ABGC mission.

This will be one of our priority. This is our commitment. So you please wait for a little while once the policy gets approved. Maybe one more last question. Thank you, sir. I'm Professor Kasim from Mass Communications Research Center, Jamia University. ABGC XR is one of the most happening centers as you told us. Right now the focus is on this sector because, as you have been told, that it offers a lot of potential for employment generation, IPR generation, entrepreneurship, and so many things. I have downloaded the report of the task force but I apologize. I have not gone through all the 60 or 70 odd pages. My question is to the chair and maybe to Mr. Rashish also. You know in gaming sector right now we are using two engines, Unity and Unreal. Has there been any thinking on this as we are the IT leaders in the world? We should ask our TCS, Vos, and HCLs, and all these big leaders. leaders in the basic requirement for the development of all these creative things which we are going to tell the country. Thank you, sir.

There are about four or five incubation centers, including T-Hub and M-Hub in Maharashtra and Telangana, and one in Karnataka where media and entertainment technology has a special fund. And we are assisting a large number of people who have created more unique technologies which are also coming up into the mainstream production pipelines. And I can, we can list it. There are about 27 technologies that have been built in the last 3 years, which we have showcased and now started using in studios. And these technologies will be now taken to the global level. We have IDBI funding these as a special technology fund as well. So the beginning of creating indigenous technologies is already on the cards. The policy also is supporting the research into this particular sector, and I think there's going to be more assistance given to this. We were struggling because the universities never understood what to do with this particular segment because they say that you need PhDs and postgraduates and all. We never had anybody because we never had courses. So the professor of practice and the faculty of practice has been allowed now. So we are slowly building these verticals.

But IITs have come to our rescue. We have created certain programs in IJPUR, I Delhi, I goti, and I Mumbai so that we should be able to really take this to the next level. And the enough interest has been shown by the computer science I vertical to specialize in animation, visual effects, technologies as well. So I think there is a good beginning. We can share the list with you. And of course, the Unreal and Unity, we are trying to get there. But what we have done is we have done it as an open-source and we are building something called as XR open source. So we conducted a contest last year and to our surprise, November 22nd, when we put a single ad, we got 10,000 students applying for it and 48 institutions applying. And we gave 100 scholarships as XR fellows and give them one year training. So these are the people who are going to really build this. But we are creating an ecosystem at this point in time. My question is related to sustainability. The whole world, including UN and all other countries, are leading towards sustainability under UN Agenda 2030. So my question is, social inclusivity should be there that suppose he focused on children, somebody focused on younger and older like that. I wanted to broaden the vision window of this forum and all other people that we should think about others also who are intelligent species like suppose we are facing many problems, monkey problem, dark problem, birds problem, lot of diseases problem. So why are we not focusing some channel related to nature like animals, birds, and educating them and getting the damages little or minimized or no damage at all? Suppose we move in Ministry, lot of monkeys are there and suppose we walk through the street, so some dog bite problem is there, so lot of problems are there. They are isolated. My question is, why are we not integrating them in broadcasting or IT platform? Because how can we isolate them? They are part of this whole world, whole nature. So this production people and IT people all should come together, I think, and they should make a broader vision. Thank you, sir. We really get your point. Thanks for making this point. But what we do in animation and visual effects is we create monkeys and snakes and everything in animation only. So we live them in the nature and we don't disturb them. Thank you, everyone.





# **SESSION-10**

## Panel Discussion on Deep Fake impacting Social Media and News

#### **SESSION MODERATOR**

Shashi Shekhar Vempati Former CEO, Prasar Bharati



Mr. Vempati currently serves as the Chairperson of the Advisory Committee to oversee Science and Technology Communication, Govt of India. He was CEO of Prasar Bharati (2017-2022), CEO of Rajya Sabha TV(2017-2019), CEO of Niti Digital(2014-2016), Vice President of Asia Pacific Broadcast Union(2021-2022), Vice President of Indian Broadcasting and Digital Foundation(2019-2022), Member of Board of Broadcast Audience Research Council of India(2017-2022), Chairperson of External Experts Group at the University Grants Commission of India (UGC)(2023), Member of Board of the AJK Mass Communication and Media Research Center(2023-2026), Member of ICWA Council. In 2023 his book on Prime Minister Narendra Modi's monthly radio program, Mann ki Baat, "Collective Spirit Concrete Action" was released by the Hon'ble Vice President of India.

> Avinash Pandey CEO, ABP News



Having served the ABP Group since 2005 in various roles, Mr. Avinash Pandey has donned the mantle of CEO of ABP Network in January 2019. With over 26 years of experience in the Media sector, his illustrious career includes a stint with the Indian Express Group and TV Today Group. An alumnus of Harvard Business School, he is the serving President of the News Broadcasters & Digital Association (NBDA). He is also the President of the International Advertising Association (IAA) India Chapter. He has won numerous awards and accolades, most notably the CEO of the Year Award at ENBA 2022 and the CEO of the Year Award at the National Awards for Excellence 2022.



#### **Smita Prakash** Chief Editor and Deputy CEO, ANI



Ms. Smita Prakash is currently the Chief Editor and Deputy CEO of Asian News International, which is South Asia's leading multimedia news agency providing content for every information platform, including TV, internet, broadband, newspapers and cell phones. She has also got a successful podcast on audio platforms such as Spotify, Apple, Google and on YouTube - called ANI podcast with Smita Prakash. She is active on Twitter, Instagram and Facebook, and also heads the editorial department of ANI's micro-blogging team.

**Mayank Agarwal** Former CEO, Prasar Bharati

Having been the Former CEO of Prasar Bharati, Mr. Mayank Agarwal has a long experience of working in various Ministries and Departments of Government of India and Media Units of the Ministry of Information & Broadcasting. These include All India Radio, Indian Institute of Mass Communication, Press Information Bureau, NACO (Ministry of Health & Family Welfare) and UPSC. Specialized in Government Communication he was widely appreciated for his work on the prestigious Red Ribbon Express Project in 2007 and 2009 for spreading awareness about HIV and AIDS in the country.

> Vivek Malhotra CMO, India Today Group



Vivek Malhotra, Group Chief Marketing Officer of India Today Group, leads the marketing and strategic planning divisions across the Broadcast, Digital and Publishing properties of India's most respected and pioneering news entity - ITG. He also serves on the Technical Committee of world's largest TV measurement currency BARC, and is a leading member of the Technical Committee of NBA (News Broadcasting Association). Besides this he has actively contributed to industry debates, sat on juries and powers CMO Group conversations on hot topics like dynamic pricing.Previously, he has worked with India extensions of international brands like CNBC where he set up their Viewership Intelligence Unit – 'The Edge'. As the former marketing head of Bloomberg, he was also closely involved with the brand's entry into the Indian TV space and articulated the positioning for the brand and identified core consumer segments.


## Panel Discussion on Deep Fake impacting Social Media and News

## **SESSION CHAIR**

**Sashi Shekhar Vempati:** Good evening, and I think this is the last session of the 3 day, BES Expo. So, I guess we are between, you know, you and getting home. But I think we have a power-packed panel, so I'm hoping that, you know, you will pay your attention, because it's not easy to get this galaxy of speakers on one platform. The topic today is on, you know, the impact of artificial intelligence with all that is happening with fake news, deep fakes, but also the overall impact of technology on media itself. I think the media landscape has dramatically changed. So, I'll give the speakers latitude to, you know, go beyond AI itself and, you know, talk about how they see technology impacting their business, their profession as journalists and as media persons. Let me begin with Smita Prakash. As you all know, she has completely disrupted, I would say, the English news content space with her now almost world-famous podcast. And I was fortunate to be interviewed by her some time back. And today, there's an interesting role reversal. So, I'll probably ask her a few questions. So Smita Ji, we can start with you, if you could share your thoughts.

Smita Prakash: Thank you, Shashi Ji. I leave the technical aspect to the other panelists. I'm not as equipped as they are, in knowing about, the technical aspects. Let me stick to the editorial aspect of this. You know, when we talk about artificial intelligence and, when we talk about, the disruption that technology is bringing about, it has its positives and negatives, which is a given, with any technology. Of course, we are thrilled when we have new tools at our hand when it comes to news gathering, dissemination of news. It's been great working with it. I started my career in journalism in a pre-Google era where we had to go to the Press Information Bureau every day to gather information. Unless the information officer of that particular ministry gave us information, and then we tried to get the masala, the news out of it. It was hard, a lot of leg work that we had to do before Google came in. And I remember when that disruptive technology was available to journalists, the first reaction was that it's something which is going to replace, you know, leg work done by journalists, and it's something that is going to be an easy form of journalism. When I say easy, it's something that was looked down upon because anything done easily in the Indian culture is considered something which is not reliable. The same comes with using a Chat GPT or any other AI tool. Many people think that this is an easy way of doing it. You speak with doctors, and they say they get very irritated. Pediatricians get very irritated when mothers turn around and say, "But Google says this is not right for



my child, which you are giving me." So, the doctor tends to say, "Then ask Google itself, why are you asking me?"

So, you know, even as when we practice journalism, with the coming in of deep fakes, it's become more and more difficult, and it's a 24-hour battle, and it's literally a minute-tominute battle because it isn't just social media which is putting up deep fakes. There's fake news coming in from small towns and villages of India, and there are creative people, creative in the sense, negatively creative at times, and especially when we go into an election mode, these deep fakes are extremely worrisome aspects of how technology is going to be manipulating opinion, manipulating journalism. And for us, it's literally to be on our toes all the time and cross-checking. For example, if we get soundbites to say that "yahan par riot hua HAI..a temple has been vandalized or a mosque has been vandalized or a church has been vandalized", our first reaction was, on-the-spot soundbite.

You can see something happening; the camera is showing you visuals of a place of worship which is damaged. That means it's happened. But that's no longer the case now. Unless I have the police on record or the district magistrate, somebody on record to say that yes, this thing has happened, it's verified. Even if the policeman on duty has said that it's been verified and the place has been vandalized. I don't run it, even a shot of a riot or something like that, or the beginning of a riot or some police action. I'm still not ready to believe that it is police action, even though the person might be in a 'vardi' because I don't know whether it could be a fake AI-generated one. Even a soundbite sometimes could be AI-generated, and it could be completely malicious. And by the time a correction is issued, fire has already raged because via a news agency, that visual and that information has gone to hundreds of channels around the country and over 100 countries around the world.

Right? so each country has 10, 20, 30 channels, unlike India which has hundreds of channels. In Europe, for example, a country would have five or six channels, but imagine over 100 countries getting those visuals and how that has gone like fire, a spark which could be disinformation or misinformation could have gone around. So, it's something that is very worrisome, very worrying, and all of us have to be extremely cautious about how it's going to, whether we have firewalls in place. And I don't think any of us have enough firewalls in place to battle this menace. Thank you, Shashi Ji.

Shashi Shekhar Vempati : So, we have a big election coming up. So, what are you guys doing day and night ?

**Smitha:** You know praying real hard, so no, that's I'm being facetious when I say that, but yes, we are putting up firewalls. But frankly, technology, yes, but more than anything else, if something smells too good to be true, true, it's not true. So, the basic thing is to have humans, and we are lucky in our country that we have this huge manpower. Yes, it is difficult to get quality manpower, many HR professionals will tell you that, but for every visual that comes in, we have men or women checking it. So, if we get, for example, we



were just breaking that story right, whether Kamal Nath Ji is joining or not joining the BJP. So, you will have somebody from Madhya Pradesh who will check in on the ground, somebody in Delhi who will check in, somebody from Delhi airport, somebody from the BJP. So, you know, several layers of men and women journalists who will check and cross-check. That's the only way to battle it. As far as technology is concerned, yes, we can battle it in the sense of, you know, that lip movement, eye movement, the walking into an area whether he or she has walked in into an office or not come out from an airport or not, whether the person has jumped out, jumped in, those kinds of things can be checked with technology. But, actually, it is hardcore journalism which is going to save the day.

### Shashi Shekhar Vempati: Are you worried that AI Persona will disrupt your podcast?

**Smitha**: A podcast is kind of a slow-moving procedure, though I don't edit anything out unless a person has spoken about, say, their daughter or son or spouse or whatever without taking permission. So, and once that's deleted or there is a legal issue which the person is fighting; otherwise, as you would have seen, not a single line is deleted or edited out of the podcast. So, as far as the podcast is concerned, sometimes, there would be a parody account on social media which will take a part of the podcast, edit it, and put it across. Now, if I was to sit and fight out every wrong or every twisting of a sound bite or of a visual that ANI has done, I would be doing this and nothing else all day long because there are people whose job it is 24/7 to manipulate visuals and news. "Why is ANI not covering this? Why is Aaj Tak not covering this? Why is India Today not covering this?" This is manipulated news that they're putting out, whereas, I mean, we try our level best to be as fair in journalism as concerned, but, fair, you know, I'm getting into that portion about neutrality and being fair, and that's a whole different ball game. But, so far, I don't think it has become that big a situation. But, yes, like you'll see what happened with the Nupur case also, there are times when edited clipped parts are put out, and it can cause a massive impact on the personal life of an individual on the country's economic affairs. It can cause so much damage. So, it is something which is very, very scary.

**Shashi Shekhar Vempati:** Thank you. I think that was very enlightening and illuminating. One feedback, you know, along with your bestselling podcast, you should start a technology podcast as well because I don't think there's been enough conversation in India on the issues around technology. The interesting thing about this panel is worked with almost everyone on this panel and longest with Mayank, you know, as DG ,DoorDarshan, DG, DD News and also CEO of Prasar Bharati after my term ended, and so Mayank, look forward to your thoughts. Interestingly, I think all former CEOs of Prasar Bharati end up writing books so he also wrote a book, yeah so.

Mayank Aggarwal : Thank you, Vempati Ji, my former boss, very dear boss and technology expert. So really, I learned a lot about technology, as you said there, others



will take up that part, and we will talk more about the softer part. So, I have a small video, so let me start with it.

But I wanted to bring this example from my organization where I served for about 5 years and so many Mamta Chopras you saw here, so who was the real one? So, this is the technology, earlier it was photo-shopping, we knew about photo-shopping, and photoshopping even before the digital word came, there used to be photo-shopping. And after that now it is the world of deep fakes where it is really very difficult for a common viewer, ordinary viewer to make sense of what is real and what is fake. And as you said very rightly that, by the time something is detected, it becomes viral, and the damage is done. And the risks that if this technology falls in the hands, it's already there, yeah, fallen in the hands of terrorists, antisocial elements. And certainly, now it's the election season that is coming up, so this is hyper-realistic digital falsification, this deep fake, what it is. And, you know, that it takes time even if a police complaint is lodged. You know, this Rashmika Mandanna's case that happened in the month of November, and because it was a VVIP case, so the entire police force, media, everyone was after this, what is happening, what is happening. And it took about two and a half months to crack that case and to find that IP address. I think now the person has been identified, arrested. So, the damage is done within a few minutes. So, it takes a lot of time for the police or any... like the police is also at a loss, and you will say, then what is the answer to these deep fakes? First, is creating awareness that what you see you should not take it at the face value. We have to educate the new age children, particularly and everyone about digital literacy. In deep fakes also there are some good deep fakes which have been very well done. There are some, the ordinary, you will see that the lip sync that is out, then the features, they are diluted, they are distorted features. So, one can recognize if deeply you go through the video because what happens like if you see something which apparently it looks wrong, sometimes it happens, so you should cross-check. The people should be taught, the people should be made literate about what is happening in the digital world and that they should not take the things that come to them, particularly if there are suspicions about that. Second is, one should make a police complaint. Now there is a cyber crime branch of the police, and the complaint can be made online nowadays, and police acts. There was one case where I was also actually defrauded, so yeah, my money from the ATM, that was one morning, very fine morning, though it is not a deep fake case but what is the digital crime that is happening. One fine morning I got up at 6:00 in the morning, one after another I was getting a message that 10,000 rupees were withdrawn from my account, another 10,000 rupees withdrawn from your account, then in succession 70,000 was the limit and that was withdrawn. So as soon as I was aware of it, I immediately made the complaint and ultimately the money was not recovered, but the State Bank of India gave me my money. So, the thing is that people should be taught about what the law is there and unfortunately that is also beyond my understanding because there are few places from where this cyber crime is generating. You would have heard of the place Jamtara in Jharkand, the one most backward District, though the technology is so superior and a lot of crime is taking



place from there. Nuh in Haryana another example.

So other than this technology part this policing part but I would suggest I would say that the police has to be more active. When I went to SBI in fact I wanted to share with you the State Bank of India told me that they are maintaining a separate account to reimburse the money of those people who have been defrauded like this. So I asked them, "Why don't you follow the police, so they said the success rate is very low so I think technology can shed more light on this. Third, I will come to the government of India otherwise , they are taking , the minister MEiTY they are taking very prompt steps regarding this, the IT rules 2021 are there and after that also the minister he has taken the meetings with the these social media intermediaries who have very important role that whatever is uploaded on the platform they have to own the responsibility for that and not only they but those who are creating also somehow have to be caught. So this is how we counter this menace of deep fakes . So it has come through technology and technology has to give the answer to it.

**Shashi Shekhar Vempati:** Now any advice to your former organization what should DD news and AR news be doing?

**Mayank:** Yes certainly, you were there at that time when this Kashmir this Article 370 abrogation rather Amendment took place, so that time we had established a desk there to counter fake news almost on the real-time basis so, because there was a desk which was alert 24x7 basis so they have to be alert they have to be educated our people there we have the technology desk there also and , particularly now during this election there should be a proper desk proper people who are technologically, they understand they know, to be ready to counter anything like this

**Shashi:** Anything from a policy standpoint, like you know, your Press Council for the print media but now with the way AI is progressing right, what kind of regulatory framework should be there?

**Mayank:** Yeah because a very good point you have made, certain, advisory has already been issued that anything which is, deep fake and a complaint is lodged against that so that has to be withdrawn within 24 hours so, there should be stringent punishment and it should not be left only to social media intermediaries the police should be more prompt to catch the one who has made it.

**Shashi Shekhar Vempati:** So thanks Mayank I will now ask Avinash Pandey, CEO of ABP News. ABP, he's been with ABP groups since 2005. I've also had the good fortune to be with him on several industry organizations, IBDF and BARC. And he is right now leading two very important industry bodies. He's the president of the News Broadcasters and



Digital Association. He is also the president of the International Advertising Association's India chapter. So Avinash, I think we'd be very interested to see your perspective on what's happening. Well.

Avinash Pandey: Thank you very much, first of all, for calling me here. Both Smita and Mr. Aggarwal pointed out something about fake news. Fake news, as far as I understand, existed since the time humanity existed. Even in Mahabharata, it is said that "aswathama wadwa naro gazo" and during the independence movement when there was no electronic media, the rumor got spread that Gandhi has taken over the British Empire and he is now the new Governor General of India. And in Bulandshahar, some guy killed the entire policemen out there who were Britain occupied the space and ruled that particular subdivision for about two years until finally police caught him. He did not know that India has not got independent. So, the role of fake news always existed. In fact, the news that you mentioned, I just went to Jaipur and I was driving back towards the Drutgami Express that has been made. And Nuh has got the biggest building, not of DM but of the cybercrime division. It is very visible from the road, and I got down and I clicked the picture. I said, "What in a small place like that, such a large cybercrime division?" So, fake news, you know, misinformation, I'll come to that later on. But the biggest menace today that we are going to discuss is about the impact and threat of deep fake. And I'm going to touch upon the five examples that I see.

According to 2023, a state of deep fake report by Home Security Heroes, which is a USbased organization, after 2019, there is a fivefold increase in deepfake all over the world. In India, we have got Aliya Bhatt, Kajol, Rashmika Mandana, Katrina Kaif by convincingly altering their videos, people have created so much of a problem for them and for the society. Actually, what happens, often a network of deepfake videos on Facebook is lured to unsuspecting individuals who, through Telegram Channel, which my colleague also spoke about. These are similar audios, similar videos that you have just shown on the and what we can create also in the newsroom for positive things, right? There are five examples that I'll give you, which is from Sports, business, Bollywood, and including media. Indian cricketer Sachin Tendulkar flagged a viral fake video of himself that appeared on a show praising an online gaming app and that fake video said that even his wife uses that and daughter uses that app. Sachin Tendulkar is a global cricketing personality endorses several hundreds of Brands, right? Using his deepfake spread through social media platform to convince someone to buy a betting app. Think about the damage that it does to the whole industry, the biggest financial fraud. So far, using deep fake, a multinational company in Hong Kong lost \$25.6 million, to the tune of about 200 CR rupees, in a scam after employees were fooled by deepfake technology. A digitally recreated version of its Chief Financial Officer ordering money to transfer to a video conference call. Okay, the scammers applied deepfake technology to turn publicly available video and other footages into a convincing version of participants. Imagine this level of damage it can happen to our society. What will happen politically? During the Diwali Milan program in New Delhi, Prime Minister

Narendra Modi publicly mentioned, I was there in that meeting when he said, that there is a video going around about him playing Garba dance, which was absolutely deepfake. A clip circulated on social media appearing to show the mayor of London, Sadig Khan, saying that he did not give a flying s right about the Remembrance event. The audio of Mr. Khan was widely shared on social media platform during growing tensions around a large Pro-Palestinian protest planned around Remembrance event. The mayor told the BBC after the clip went viral, almost had serious disorder. Sadig Khan himself said, to an innocent listener, it sounds like me. Such deep fake can be damaging to our society, journalism. A recent viral video on social media platform showed an extract from one of the France 24 News television on its French language channel. In it, the presenter announces that French president Emmanuel Macron has postponed his trip to Ukraine because the French Secret Service had intercepted an assassination attempt against him. But the news was false, and the video was a deepfake. Now, suppose someone can take their painstaking time to develop an entire video based on the looks and mannerism of a renowned journalist. In that case, the audience may think that the message is coming from an authentic source of information. At our Network, we started much before when the deepfake came about 7 years ago. We started a program called 'The Viral Sach', and we used to analyze all the viral videos circulating in the market. What is the truth inside it? The biggest problem today is not only the deep fake; the fake always existed in one form or the other, it is about the responsibility that we don't discharge.

I'll give you two examples of that. Everybody in this country knows that jumping a red light is an offense. You don't need an education for that. Media spends tons of money every year educating people to observe road safety rules. No one does it if given a chance. If he does not see a cop, if the speed limit is 50 or 60 or 80, they drive until they see a camera, right? The problem is the knowing-doing gap. We know what to do; we know the consequence of not doing it, and yet we go ahead and do it. Media has a very important role to play in deep fake. I attended a conference in Cannes where Monica Lewinsky was a keynote speaker. It's very rare she's that's the only event that I have attended where she was the keynote speaker, and the entire Cannes Palais was full. Okay, all the Halls, including the video streaming, it was full, completely packed. And the event was organized by leading advertising agency of the world, Ogilvy, and what was the message in it? Monica came and spoke about her life, how she fell in love with her boss when she was just 21. Very natural for people, right? Because you're glitter in your eyes when you look at your boss's success. And what happened next to it? When people were carrying the juicy conversation and sharing it on social media, forwarding it to people, talking about it, whatever social media then existed, talking it on radio, television, etc., which destroyed her life. She admitted that she has made at least four suicide attempts. Her parents removed locks from her bathroom door. So here the message is this that the responsibility lies in the individual. You forward a message without even thinking twice. Even I have done so a couple of times while I'm so conscientious. Think before you forward. If this message, we communicate, the deepfake matter will end very soon. All of us have to be responsible, and media can



play a very important role in propagating this message. Thank you.

**Shashi Shekhar Vempati:** Thanks, Avinash. I think very, very sobering words there. Absolutely. Anything specific that the NBDA is doing as a group together on Ai and deep fakes?

Avinash Pandey: Um, we have had several discussions on this as to what we can do. Okay, so all of us have dedicated programs. And whenever the Minister of I&B also advises us, time to time, that there is a messaging going on like this, we must curtail in whichever form that we do. We all have dedicated programs, but I think all of us have programs showing the viral videos in the market. Okay, and those viral videos we analyze and say what is right and what is wrong. Most news channels are doing it. Digitally, we have partnered with technology companies which are actually analyzing daily basis as to what is the fact. And every news organization, including Aaj Tak who is sitting on my left, in my organization, we have tied up logical facts to check all the facts of any video that comes to us. See, most newsrooms work on one simple principle, and you know, my colleague can bail me out on this, that we always go by the primary source. If it is a secondary source, it has to be verified before it goes on air. But social media does not do that, and hence it is very important that what is circulating on social media, mainstream media should come out and say what is right or wrong. Of course, it requires investment at our end, but it is in the larger interest of the society to which we serve. At the end of the day, we have a social contract. We are not in the business to just make a few amounts of money or profit

**Shashi Shekhar Vempati:** As a CEO. Is your organization having the right skills ? Because the pace at which technology is evolving is so fast. How are you keeping your pace with technology?

**Avinash Pandey:** So, we see, we are the media. We are basically a bunch of journalists who got educated and lost out in the UPSC examination probably, and then started journalism. So, jokes apart, but I'm saying that look, we have limited this thing. And if I apply the principle of running a business, which is the discipline of doing business, is that you should not attempt doing something that you are not an expert at. So, we don't attempt to do that. We tie up with technology companies who are experts in doing that. We are using Google a lot, by the way. We have partnered with Google to discover what is fake and disseminate that information through our network. So, we have a lot of technology companies who are working with us, including, if you come out with something, we'll be happy to partner. And I think it's good that you got to spend some time with the demos in this beautiful exhibition.

Shashi Shekhar Vempati: I think there is a lot of interesting technology there, so



thanks again for your insights. And now I will turn over to Vivek Malhotra, Chief Marketing Officer of India Today Group and a good friend, perhaps someone that I can always step into to understand what is happening in this media landscape. And he's been very kind with his time, you know, to keep updating me on what's happening in the news media industry. So Vivek, you go ahead and share your thoughts.

Vivek Malhotra: Thanks so much, Shashi Sir. So, you've been a mentor, and thanks for all the kind words. And I'd like to say that people on this platform, Smitaji, Mayank ji, Avinash ji, Shashi G, actually, you know, they carry a lot of credibility, and they're doing they obviously do a lot of work before they put anything on air. The reason why I actually call deep fake amongst the most serious challenges of our time is that deep fake actually hits at the visual cortex of the human being. It actually challenges and calls into doubt a very, very old phrase which says, "What you see is what you believe." Because right now, what you're seeing may not be worth believing. Therefore, it puts actually the responsibility squarely on three parties or three partners who have to collaborate to do this. One is obviously the broadcasters and the content creators who have to ensure that they lead by example. They have fact-checking. We are in the business of trust. And therefore, you know, while you have many problems that will come with AI, including deep fakeness, this is also an opportunity to build brands that are based on trust. And it's very important that channels, wires, platforms, OTT players—they actually become that benchmark against which the news is verified so that the consumer has a place to go when he's in doubt. Secondly, why I call it very serious is, you know, it's almost like semiconductors when they were, you know, growing. They actually never grew linearly. They went up exponentially. And that's the way this technology, these adversarial algos, they're growing exponentially. And therefore, you know, things that we could catch, like blinking, like not being coherent all of this is now gone. They've actually naturalized every border, every atmosphere, the entire ambience. And therefore, it's very important that there is something which is an anti-deep fake scientific task force that tackles it, which may involve, because a lot of deep fake comes from something that is original. And if the original thing has a library, you will always have a fingerprint against which you can match. And thirdly, an important point that I'd like to make here is, one is deep fake, the content; the other is the speed with which deep fake, the content travels. And therefore, that brings the regulator, that brings the tech part, that brings the people who make the policy of this country to create something which travels faster than any medium deep fake can travel. And that really brings in Shashi ji, your role and the way we're looking at direct to mobile, that shareability is going to grow. And I don't know how long it's going to take for people to know what to share, what not to share. But if you have something which is traveling faster than the way fake news is traveling, you'll be able to nip it. So, those, to me, would be three important critical factors that make it very critical. And I think we do have a solution for it, but that will need one intent and second technology. Thanks.



**Shashi Shekhar Vampati:** I think a very interesting point you made about direct to mobile, that I think, in the days to come, you know, that would be the most fastest way to counter something going wrong because the government can very quickly broadcast an alert or a message to almost, you know, everyone with a smartphone or a mobile phone that can receive those signals. As a group, India Today, I know, has used AI in various ways. Right? Give us a positive side also, right? How is AI impacting, you know, what you guys are doing in your newsrooms, in your studios?

Vivek Malhotra: We actually launched India's first AI anchor, that is Sana. And she is, in fact, the world's first AI anchor that is not based on another human. And the first interaction she had was with the Honorable Prime Minister of India. And that's where we launched Sana. Now, Sana is getting trained. So we thought when we started playing with AI, we thought Sana is going to be giving out, you know, maybe a weather report or, you know, she will always be dependent on somebody else who's another human who's going to write the rundown, and she's going to just come and narrate it. But honestly, what I can tell you is that today, Sana is capable of actually running a bulletin without any human interface, which means she can tackle the PCR; she can do the script; she can do the fact-checking based on the data she has. And now, imagine when it comes to election programming, the oldest journalist of India would have 30 years of experience, and Sana would come with over 75. So that's really the potential that you can harness from AI. The second is an interesting trivia I'd like to give all of you. WhatsApp channels, WhatsApp broadcast channels, are a new thing. WhatsApp has started those channels. The factcheck channel of India Today is actually much bigger than many news channels in the country. So that really goes to say that today, the audience is really, really, really keen to know what is real, what is not real. So it may actually-I mean, I'd not be surprised if the fact-check channel of India Today is bigger than the channel of India Today. So, I mean, that's where the power of AI comes, and the biggest thing you can do is quickly try and get original libraries in place, get fingerprinting in place, and then try and make a forum where you share this library with each other. That's the only way people do this, and then technology will eventually tell us that all Algos, at some point, will start memorizing, and that's the time you beat them. So, I mean, it'll take a lot of technology, but I think AI is the way to bring that technology forward.

**Smita Prakash:** Can I come in? Sorry, you know, listening to the speakers, a couple of things that I just wanted to point out that when we talk about, that we should have policy changes, we should have stricter policing, we should have, um, actually what happened, it was a market course correction. If you remember, there was a time when channels—and I'm not taking names, but there were channels which were showing cows being beamed up, right, for quite some time. Those were the visuals which were running, and ads were coming in for those. Those were the hottest selling news programs. Those channels which were showing that were, so people who were doing real news, their shows were not



**Vivek Malhotra:** This just happened, Smita , on Dawood Ibrahim death. Yeah, the first tweet on Dawood Ibrahim's death was from a fake handle of Pakistan's defense minister or home minister. It was his fake handle, and it was picked up by all leading news channels, and they debated for two days. Finally, it was an underworld don Chhota Shakil, who shut



down everybody, saying that you guys have no work or what. He's absolutely fine.

Smita Prakash: But again, will you believe Chota Shakil?

**Vivek Malhotra:** So, no, I'm just saying that, you know what the news was from a fake account of a Pakistani minister, and this is how it became big. So, the danger that you are talking about, I'll just make one quick point. The danger that you are making, and I have seen this in my alumni meeting at HBS, is how technologies are improving. There is already a Triple D Center that they have created for this. The technology is moving at such a pace that unless we regulate it and unless we create a consciousness through media, we are not able to tackle it. They showed us a machine in Triple D, a Chinese game, which has 200 million moves. In one lifetime, you can never understand all the moves. Forget about one lifetime; hundreds of people, their entire lifetime, they cannot understand all the moves that machine does in 2 days. After that, it defeats everyone, correct? Even playing chess itself.

**Smita:** Like you are speaking right now in English; there is an app. If I put your voice out there, within minutes, you could be speaking in Russian. It's possible, right? For example, you're doing a bulletin. If Star News is your content-sharing partner of ABP, so you have a bulletin; they will take your bulletin. They will translate it and then they will put out the news. No need for that. They have a Sana-like anchor then who will just pick up your voice, translate it into Russian simultaneously, literally on deferred live, as it, and you would be speaking in Russian. And it's AI-generated, AI-narrated, yeah.

**Vivek Malhotra:** We are experimenting with that in the newsroom to translate Hindi into Bhojpuri. It doesn't work for Indian languages so much, but it works very smartly for Indian English.

**Shashi Shekhar Vempati:** Interestingly, the Prime Minister's Mann Ki Baat corpus has been used to train some of these algorithms to talk in Indian languages. So, it's coming very soon. This is again the speed versus accuracy.

**Mayank:** So, the channels go for just breaking news, the speed, who will be before me, if I know I met the reporters "unhone bataya ki hamaare channel mein humse pehle, ABP Ki jagah jo Aaj Tak walon ne break kar diya to hamein data pad gayi boss se" That came out to be fake. I'm not just mentioning what exactly the thing was. So, whether we have to go for speed or accuracy, unless we check with authentic sources, the news, we should not go for it. So, what do you?

Smita: Easier said than done.



**Mayank:** I mean, ultimately, we were doing in DD; that's why we were a bit late, but we were always accurate.

**Smita:** Yeah, I know. Even when the Prime Minister was assassinated, it took a number of hours, but unless that was..

**Mayank:** Long back, long back, or whenever, but the point is, I get that, but the market forces are such that all channels are competing against each other, and it's a fight for eyeball space and advertising space. And actually, if you look back the next day, nobody remembers breaking news "kisne kiya" So, it's actually just competition among each other. It's not a winner-takes-it-all as far as breaking news is concerned.

Vivek Malhotra: Noida ke chai ke dukaan me baat karne ke lye conversation hota hai

**Shashi Shekhar Vempati:** But I think it's interesting that, for example, after the Pakistan elections, Imran Khan's speech is AI-generated, right? So, I think that is a new reality that we are living in. In fact, my niece in the US said that your book on Mann Ki Baat is too complicated as a kid; I can't understand. So, I used ChatGPT to dumb it down for a child. I actually did that. So, today, AI is so powerful. Any closing thoughts, anything that you guys want to share before we wrap?

**Mayank:** So many benefits also of these deep fakes. They are being used for education and for other purposes also that you can highlight. If it's not only always negative,

Shashi Shekhar Vempati:: correct, like the way India Today is using the AI tools and especially for Indian languages because I think that is the biggest challenge, right? How do you deal with this diversity of regions and languages, and I think using AI tools is going to make a huge difference.

Smita Prakash : Let's take conclusions from that side. Any closing thoughts?

**Vivek Malhotra :** So, I agree with what Smita ji said. I agree with what Avinash is saying. And I think my closing remarks would be that, the way to tackle this challenge is to be building a culture of trust, truth within the organization and at least as far as the India Today group is concerned, we already have 500 trained journalists on fact checking and we aim that every journalist in the company will be a trained fact checker. I think it's a good starting point.

**Avinash Pandey:** Three things we have to do- at the news channels' level, news organizations' level, we should promote the value of knowing before you forward. And I know



there is a limitation to that, but look at the campaign that the Brits ran against terrorism where they pasted all over Britain saying that" if you see something, say something. You know, just by that slogan, if you see something, say something, they managed to catch a lot of people who could be trouble creators in the future. So, campaigning for, in the media industry, for this defect is very, very important. The second one is that the big tech companies need to work with us to make sure that the traditional, established media players like us or others—I mean, we have 100 years of history in this country of running media businesses - Their content should come first rather than the YouTubers and all that who are actually involved in spreading a lot of fake news. And the third one is that there has to be a strong system of finding out who generated that fake news because it is distorting people's personal lives, society, business, and the overall country. So, we must have a system and regulation in place so that those people are caught and punished. One good punishment will solve a lot of problems.

Shashi Shekhar Vempati: That's almost what Mayank was saying earlier.

**Mayank:** So anyway, just to pick from Pandey ji, from what you started, Mahabharat, before the damage is done, Ashwatthama maara gaya. It was an elephant. But a fateful news for Dronacharya. So, before the damage is done, something we have to...I said the technology has to counter the technology, so the technology has to come up with the answer.

**Shashi Shekhar Vempati:** That's why we have an audience of engineers. Yeah, the audience of engineers here, we're discussing content when the audience is engineers.

**Avinash Pandey:** So, you have to come with that, you know? I'll just add one more point. I have seen a technology 3 years back in the US where the person was wearing the headgear here in San Francisco, and the other person was wearing the same headgear in New Jersey. And the other guy was playing the game of chess, and he was playing what he was commanding without speaking. He was moving his hand here, and that guy was moving his hand there. That's the communication; he was controlling the brain of that person. Wow, it is already happening, yeah, right? It's not in the consumer space; that's B2B to brain to brain, yeah, yeah.

**Smita Prakash:** Yes, journalists have a great responsibility, and as people who are in positions of influencing minds have a greater responsibility. And I am very scared for children who get influenced because of these deep fakes which are coming into the market. Of course, competition, market; it's going to affect commerce in a great way. And our hope is that people who are working on technologies will be able to give us tools by which we can disseminate this information, especially to impressionable minds like the



elders of the family who are consuming medication, herbal medication and stuff like that because which is Al-generated. People who dress up as doctors but are not doctors and are telling people to eat one meal a day or eat seven meals a day, eat this herb, that herb. Those are such dangerous things as well as body shaming of fat people which young girls are watching, fairness creams, these are all make-ups which are coming into the market. Children who are using Al technology to make skin lighter when they have this shame. They're unable to go out in social gatherings because the pictures that they have uploaded, the reels they have uploaded, are showing them as fair. And when they actually go for job interviews, they are not like that. So, they get trolled; they get laughed at when they go for job interviews. These are things which impressionable minds are getting hit in a very, very scary manner. And it is necessary for us, and Shashiji very kindly spoke about the podcast, and I look forward to using the platform of mine. Now that I've come to this position where I want to educate more and more young people about the dangers of using deep fakes and Al and about how it's impacting our minds. Thank you very much for this opportunity.

**Shashi Shekhar Vempati:** Thank you. I think it was a great panel and great audience. Let's wrap it up. Oh, one question. We have one quick question before we wrap.

**Pankaj from Audience:** So, this goes out to my friends Aash and VI. Every challenge actually comes with an opportunity. It depends on how you look at it. And Avinash, you had this chat on WhatsApp University, the Talkies episode that we did. Everyone is a news reporter; everyone is announcing, making statements. And what will happen over time, the exposure of deep fakes will be so intense that everyone will know that this probably could be fake. And that would be an opportunity for you guys, right? Because as a structured organization, whether it's ABP or Aaj Tak , it will come with some kind of a badge of credibility. And as a viewer over the next few months or years, people would want to validate with a brand as against a YouTuber or as against an individual making a claim. So, I think that's a great opportunity for established brands. And the way forward to monetize this opportunity, as you said, Avinash, is to spread the awareness of deep fakes and the fact is, turn to a trusted source before you believe anything. So, that's an opportunity for you, right? Do we agree on that?

**Avinash Pandey:** Please understand that most of the fake news is spread through the internet. So, we have already, through DNPA on the board, that I have spoken to Google and Facebook, saying that the verified medium must have, like Twitter had a Blue Tick, which they earlier used to do without taking money. Now they are taking money and giving it to everyone. But we are suggesting to them that the verified news medium, which we are licensed from I&B Ministry, we go through certain kinds of regulations, or we are regulated in India following certain rules and systems. Those should have a tick mark. The



news which comes on the internet because if that happens, people will know what is right and what is fake. I think that has to be solved through technology.

**Vivek Malhotra:** Yeah, Pankaj, I think you make a very, very, very good point. It takes a long time for critical thinking to develop among the masses. So what you're saying is right; there is a very big opportunity where critical thinking emerges, and masses do know how to discriminate between fake news and real news. It'll be a big opportunity, but I think today, where we are sitting now, it's more about responsibility. How can we all get together and create so much awareness in very little time that this time of not knowing critical awareness is trimmed to the barest minimum? I think that's the takeaway from your question. That's what we have to devote ourselves to.

Shashi Shekhar Vempati: I think we are almost out of time.

**Anchor:** See, that's the inquisitiveness among the audience. Thank you so much for a highly insightful and interactive session. With this, we come to the end of the last session as well.







## **REFLECTION OF BES EXPO 24 IN MEDIA/ SOCIAL MEDIA**



## Explore innovative options for broadcasting: Anurag Thakur

NEW DELHI: Union Minister Anurag Thakur on Thursday made a strong pitch for exploring innovative options of broadcasting such as Direct-to-Mobile to ensure wider reach of content to all strata of the society and also become self-reliant in the sector.

Inaugurating the annual Broadcast Engineering Society Expo here, Thakur also stressed the need for encouraging indigenous research and development by nurturing scientific talent and fostering partnerships between industry and academia.

"New Direct to Mobile (D2M) technologies offer exciting content possibilities for terrestrial broadcasting not only to television but also on handheld devices such as mobile phones, notepads on any where, anytime basis, and that too without the need of Internet." the Information and Broadcasting Minister said.

### THE WEEK

## Explore innovative options for broadcasting Anurag Thakur

PTI | Updated: February 15, 2024 16:34 UST

New Delhi, Feb 15 (PTI) Union Minister Anurag Thakur on Thursday made a strong pitch for exploring innovative options of broadcasting such as Direct-to-Mobile to ensure wider reach of content to all strata of the society and also become self-reliant in the sector.

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EXPO202





## ENGLISH COVERAGE)

S. No.	Publication	Link
1	PTI	https://www.ptinews.com/story/national/explore- innovative-options-for-broadcasting-anurag- thakur/1292991
2	The Week	https://www.theweek.in/wire-updates/ national/2024/02/15/del59-mib-thakur.html
3	Outlook India	https://www.outlookindia.com/national/explore- innovative-options-for-broadcasting-anurag-thakur
4	BNN Breaking	https://bnnbreaking.com/tech/revolutionizing-digital- radio-drm-and-starwaves-introduce-groundbreaking- mobile-solution
5	SME Street	https://smestreet.in/limelight/union-minister-anurag- thakur-inaugurates-bes-expo-3809797
6	RedTech	https://www.redtech.pro/drm-demonstrates- smartphone-reception-at-bes-show/
7	News on Air	https://newsonair.gov.in/News?title=1%26B-Minister- Anurag-Thakur-inaugurates-BSE-EXPO-2024-at- International-Conference-and-Exhibition-on-Broadcast- and-Media-Technology&id=477307
8	India.com	https://www.india.com/news/india/anurag-thakur- inaugurates-28th-international-conference-of-bes- check-key-highlights-of-his-speech-6727498/
9	Daily Excelsior	https://www.dailyexcelsior.com/explore-innovative- options-for-broadcasting-anurag-thakur/
10	Radio Info	https://radioinfo.asia/news/drm-at-bes-expo- india-2024/
11	Indian Mandarins	https://www.indianmandarins.com/news/anurag- thakur-to-address-international-conference-and- exhibition-on-broadcast-and-media-technology/28411
12	Radio World	https://www.radioworld.com/tech-and-gear/products/ fm-drm-reception-on-mobile-phone-shown-at-bes
13	Technology for You	https://www.technologyforyou.org/bes-a-beacon-of- technological-advancement-union-minister-anurag- singh-thakur/

#### National News

#### Last Updated: Feb 15, 2024 2:21PM

I&B Minister Anurag Thakur inaugurates BSE EXPO-2024 at International Conference and Exhibition on Broadcast and Media Technology

**News on Air** 

Indomised and analocation of on soor variantly pring in maker may be a data the industry generation of of biodecisticity potch in outside that threads that industry multic helpfor having generation threads by adopting outling edge and subainable technologies and focusing on local/add contents to cater strata of society and enrich the user economics.



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#### Anurag Thakur Inaugurates 28th International Conference Of BES, Check Key Highlights Of His Speech

The 28th International Conference of the Broadcast Engineering Society (BES) has been inaugurated by the I&B Minister Anurag Thakur. Check key highlights of his address.

Published: February 15, 2024 7:58 PM (ST Published: February 15, 2024

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## Indian Mandarins

#### UST READ

Anurag Thakur to address international Conference & Exhibition on Broadcast & Media Technology



or L Murugan, Santay Jaiu and Gauray Dwiver

New Dehit (14.02.2024) Broadcast Engineering Society (India) is organising BSE EXPO-2024. 28th International Conference and Exhibition on Broadcast and Media Technology on February 15, 2024 in New Dehi. Union Information and Broadcasting Minister Anurag Singh Thakur will be the chief guest. He will be joined by his deputy in the ministry Dr L. Murugan.

#843

Information and Broadcasting Secretary Sanjay Jaju (IAS: 1992; TG), Prosar Bharati CEO Gaurav Dwivedi and Chairman TRAI Anii Kumar Lahoti ne Address will be delivered by Sunii, President, BES which will be followed by the

address by Gaurav Dwivedi (IAS: 1995: CG), CEO, Prasar Bharati, BES Award will be distributed by Anurag Singh Thakur which will follow the release of Exhibitor Directory and Conference Proceedings: Sanjay Jaju will address the gathered audience nhile keynote Address will be delivered by Anii Kuma Laboti Defore Anurag Jingh Thakur addresses the conference, At 1100 AM the conference will be formally inaugurated by Anarag



#### RENDING NOW Major scam in JKRTC, reimburses commission to con

Explore innovative options for broadcasting: Anurag Thakur



### **RADIO WORLD**

## FM DRM Reception on Mobile Phone Shown at BES

The DRM Consortium and StarWaves highlighted a novel mobile solution

#### BY T. CARTER ROSS PUBLISHED: FEBRUARY 15, 2024

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#### At the BES Expo in New Dehi, India, the <u>Digital Radio Mondiale Concortium</u> demonstrated DRM Digital FM reception on a mobile phone.

According to DRM, no proprietary receiver tachnology was needed, so long as the phone includes an of the-shelf analog PM tuner chipset. Such chipsets typically require the use of wired headphones, which double as an antenna. A photo released by DRM showed the phone using a StarWaves-branded app. StarWaves introduced in 2021 a DRM SoftRadia app. however, that app requires an external dongle or tuner.

Ahead of the Feb. 15–18, 2024, exhibition, StarWaves had announced plans to show "an exciting novel mobile solution" at the DRM

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#### COLINEL WONG

BES a beacon of technological advancement: Union Minister Anurag Singh Thakur

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Drawing inspiration from AtmaNirbhar Bharat vision of our Hon bia Prime Minuter of Iodia, Thakur especially guoted two instances of mobile handsets and toys wherein Iodia has no



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## HINDI COVERAGE

S. No.	Publication	Link
1	Live Hindustan	https://www.livehindustan.com/ncr/new-delhi/ story-need-to-find-new-options-for-broadcasting- anurag-9328550.html
2	Times Now Hindi	https://www.timesnowhindi.com/india/inauguration- of-broadcast-engineering-society-expo-2024-held-at- pragati-maidan-article-107729402
3	Punarvas Online	https://www.punarvasonline.com/doordarshan-and- akashvani-have-fulfilled-the-responsibility-of-informing- educating-and-entertaining-many-generations-of-the- country-anurag-thakur/14011/



प्रसारण के नए विकल्प तलाशने की जरूरत : अनुराग स्र विजी रामेंग केंद्रि भी अनुसाराइर ने मुख्या में क्येस्ट रूमीखन के जाता थे.



• तिनुस्तम टीम व्ह विश्ली Thu, 15 Feb 2024 00:45 PM

The USF M21406-05FM नई दिस्सी, एर्न्सीक केंद्रीय मंत्री अनुवन ठरपुर ने पुरस्क को स्वायेकर ट्र-बीवाइल तैसे प्रसारक के अपिनस विकर्षा की अपनान तलावांचे की वालात की। ताति, सामाज के बभी ज्यां जित किंतुन विषय सामाजी की पूर्व सुनिष्ठित की जा बके और हेंग जानोप्तेम वन रकी। वहा सिंह मोंडलार होन्द्रीयर्थन संबायुक्त (केंद्रावर्स) एंडाओं के सुराज सामाजी के बार्ट की स्वाये का साम सुराना एवं प्रजस्त मंत्री ने वैजनिक प्रतिभा को बहुतवा देवर ठातोंग और विजा जलते के बीप साम्रोज्ज से स्वायेने अपने कोर जिया देवराजित का देवराजी के बाराय दिन्स तर की साम प्रतिभाव मोंडा उपनेक ट्रांस्ट्रा स्वार प्रदेश प्रति में के साम के प्रति प्रति की अपने प्रति का साम के मोंडीक की प्रथ में केल प्रत्ये साम उज्जरायों यह जिस सी सामा रक्यों के साम प्रति में साहत मोंडीक की प्रथ में केल प्रत्ये साम उज्जरायों यह किंसी भी समय, रक्यों भी क्या राज्य की रही

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Selhi News Today: सुवजा एवं ससाठन नहीं असुराम सिंह वायुव ने दिल्ली के प्लति नेदाल में बॉवलास्ट हातीनिवरिंग सीडाइटी (वीडीवर्ड) हुएट अंगोरिन प्रसायन और सीडिंग्ल क्षेत्रीमिकी पर 3क्षी अन्तर्वन्द्रीय सलंकल और प्रदर्शनी का इड्राटन किंगा उन्होंने दर्शकों को संक्षेत्रित करने हुए बॉडाक्यर इन्हीनियरिन सोसाइटी को प्रसायन इनेक्वियरिंग के हंस व

अनुराग ठाकुर ने कहा कि सार्वजनिक सेवा प्रसारण को बढ़ावा देने, समावेशी नीतियों को डिजाइन व लागू करने, मीडिया से जुड़ जागरूकता पहल और प्रसारण एवं मीडिया उद्योग में निजी भागीदारी को प्रोत्साहित करने के प्रति इसकी अटूट प्रतिबद्धता -भारत में एक जीवंत, समावेशी और सुदृढ़ प्रसारण एवं मीडिया इकोसिस्टम की नींव रखी है, जो विविधतापूर्ण, सूचनात्मक और जिम्मेदार है।



सूचना प्रसारण मंत्री ने आगे कहा कि हमारे देश की विविध जरूरतों को पूरा करने वाली गुणवत्तापूर्ण कंटेंट प्रदान करने हेतु

### **PUNARVAS ONLINE**

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## **KEY SOCIAL MEDIA POSTS**















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#### 🙉 Anurag Thakur (मोदी का परिवार) 🤣

Delighted to be at the Inauguration of the Broadcast Engineering Society (BES), Expo 2024: Evolving Media Ecosystem: Innovative, Impressive & Sustainable Broadcasting.

It has been a harmonious symphony reverberating with the accomplishments of the past and the promise of a bright future. Through innovation, immersion and sustainability practices, we're set to reshape the media landscape with active participation from all stakeholders.

BES has been at the forefront of technological advancement and innovation in the field of broadcast engineering. Through the expo, for the last two decades, it has provided a platform for the exchange of ideas.

In the progress from the black and white screens of Doordarshan to the HD and now 4K digital transition, Prasar Bharati has played a pivotal role. The @MI0\_india has been a steadfast guardian of the broadcasting industry, steering it through winds of change.

I congratulate BES for their journey so far and extend my best wishes to them to meet the challenges ahead and chart a path of future towards innovation, self-reliance and sustainability.





Prasar Bharti CEO Gaurav Dwivedi says the digitalization of TV and new media devices have redefined the broadcasting landscape.

The features offered by today's technologies, like personalization and the accompanying interactivity and tactical capability of the new media platforms, have presented the world with new opportunities and challenges for all stakeholders.

@prasarbharati | @MIB\_India | @ianuragthakur









## KEY TAKEAWAYS & RECOMMENDATIONS FROM BES EXPO 2024

There were following key takeaways from BES Expo 2024 which included as many as nine conference sessions on relevant topics and various keynote addresses and special sessions spanning three days from 15th February' 2024 to 17th February' 2024.

- 1. The digitalization and emergence of new media devices have re-defined the broadcast landscape. The features offered by digital television like personalization of content, the accompanying interactivity and the technical capabilities of the new media platforms have thrown a world of opportunities as well as challenges to all the stake holders viz, content creators, broadcasters, distributors, application developers, CPE manufacturers to reach out and catch the eyeballs or eardrums of the viewers or listeners.
- 2. The emerging ecosystem is posing a great challenge to the traditional broadcasters whether terrestrial or satellite. Traditional broadcasters need to evolve, innovate and reach out to the audience through multiple platforms by using the new media platforms to complement the services rendered through traditional broadcasting means. This requires considerable commitment of resources on the emerging platforms and technologies while sustaining the traditional linear broadcast infrastructure. It is also equally important to involve all the stakeholders in the pilot launch stage itself when new services are launched like mobile broadcasting to infuse confidence so that when the services are launched, appropriate content and adequate receivers are available so as to reach the viewers.
- 3. Public Broadcasters have the responsibility of broadcasting content to cover citizen of various creeds, castes and culture and broadcasting must expose values which are not only industrial or commercial but which aim for the benefit of society at large. For example, they have an obligation to serve the whole population and often provide services to minority groups, in minority languages, even though viewing statistics may be low. They may also serve diversity by broadcasting programmes which cater to niche markets or which are costly to produce.
- 4. The new Direct to Mobile (D2M) technologies offer exciting content possibilities for terrestrial broadcasting not only to television but also on handheld devices- Mobile phones, i-pads etc on anywhere, any time basis, and that too without the need of



Internet. There is a need to explore and embrace innovative options of broadcasting like Next Gen broadcasting which shall not only ensure wider reach to cater to all strata of our society but also serve as a catalyst for ever evolving user experience.

- 5. Hon'ble Minister underlined that India's linguistic diversity is our strength. Supporting regional languages and fostering hyper-localized content is essential not only to compete with global platforms like Netflix but to achieve the larger goal of providing equal opportunity to all for contributing to nation success. The expansion of the Film and Television Institute of India's regional campuses emphasizes our commitment to multilingual content creation. As we invest in regional content and languages, let us celebrate the rich tapestry of our cultural heritage and amplify the voices of every corner of our nation.
- 6. The media landscape is undergoing a metamorphosis. Consumption patterns are changing rapidly, with audiences' taste migrating to OTT platforms and demanding personalized content. We must acknowledge this shift and adapt accordingly. As Chanakya, the astute strategist, advised, "Change is the law of nature. Only the fittest survive." Our content creation strategies, latest technology adoption and regulatory frameworks need to evolve at a rapid pace to remain relevant in this dynamic environment.
- 7. Content regulation also requires careful consideration. Striking a balance between freedom of expression and upholding societal values is paramount. As Rabindranath Tagore, the revered poet, envisioned, "Where the mind is without fear and the head is held high... knowledge opens out like the perfect blossom." We must foster an environment where creative expression thrives within reasonable boundaries, ensuring responsible and ethical content.
- 8. From session on "Direct to Mobile (D2M)" broadcasting, it emerged that in view of ever-increasing cost of data plans and limitation of internet reach and several other important factors, it is right time for India to launch D2M broadcasting which enables direct broadcasting to mobiles without the need of internet. It also facilitates broadcasting of alerts and other essential messages in a targeted manner. It was also underlined that efforts must be made to deploy home grown technologies for D2M broadcasting in line with clarion call of Hon'ble PM towards "Atmanirbhar" Bharat.
- 9. Session on Digital Radio Broadcasting underlined the need to choose digital radio technology which can be used by all radio broadcasters and which can easily create a user friendly eco-system.



- 10. There is a need of Government support for animation industry in India to ensure that kids and young generation get to watch local content based on Indian culture and history rather than content based on western culture.
- 11. To avoid the menace of deep fake content, there is a need to find technological solution which can curb it and also there is a need to sensitize people to remain vigilant and show due responsibility before forwarding any such content.
- 12. It clearly emerged from the panel discussion on "Innovation in Content Production and Post Production" that AI is playing a big role in production and post production for bringing overall efficiency and more accuracy though it is not going to take away lot of jobs though AI would require different kinds of skill sets.
- 13. The application of AI in news automation is bringing much greater efficiency in operations of newsroom and it can help news personnel in several ways.



## GLOBAL TRENDS HAMPERING THE GROWTH IN THE BROADCAST & MEDIA INDUSTRY

## Global Trends

The Global Broadcast and Media technology industry was much more resilient than expected during the pandemic, dropping by 1.9% in 2019 and a further 1.9% in 2020 before rebounding with 7.9% growth in 2021, far surpassing the global average. The industry has now stabilised, with 1.6% CAGR growth between 2022 and 2026 expected.

- The total market value of the industry in 2021 was \$67 billion, up almost 4% from the previous high of 2018.
- The impact of the COVID-19 pandemic on the industry has been less severe than previously expected, with declines seen in both 2019 and 2020 amounting to a 3.8% decrease in the 2018 market.
- Much of the decline in 2020 and the subsequent rebound in 2021 was driven by the production and post-production services industries as the creation of new content was postponed until after the worst phase of the pandemic.
- Provisional revenues for 2022 indicate the industry is maintaining broadly the same level as in 2021; revenue recovery was strong in 2021 meeting pent-up demand from the pandemic, which has now given way to more steady growth from 2023 onwards.
- Overall industry growth will be around 1.6% CAGR from 2022 to 2026.

### India Trends

- The Indian M&E sector continued its growth trajectory; it grew by INR173 billion (8.1%) to reach INR2.32 trillion (US\$27.9 billion).
- While the sector was 21% above its pre-pandemic levels, television, print, and radio still lagged their 2019 levels. While television remained the largest segment, we expect digital media to overtake it in 2024.
- We expect the M&E sector to grow 10.2% to reach INR2.55 trillion by 2024, and then grow at a CAGR of 10% to reach INR3.08 trillion.
- The television segment has witnessed some interesting, yet dichotomous developments in recent times. Although the number of pay TV subscribers continues to decline, the overall number of TV viewers continue to grow.



# Legacy Television & Distribution showed declining trends in 2023

- As of June 30, 2023, India has 903 approved TV channels. The number of pay channels increased to 360 from 358 in the previous quarter. The total number of free-to-air channels is 532; among the 360 pay channels, there are 256 standard definition (SD) and 104 high definition (HD) pay TV channels. There are 42 broadcaster aggregator chains. The top three chains are Star (77 channels), TV 18 (59 channels), and Zee (50 channels).
- The total number of Multi System Operators is 1737, with thirteen larger MSOs and one HITS operator having more than a million subscribers, totalling 43.9 million subscribers. The top MSO is GTPL, with 9.10 million subscribers. There are four DTH Operators, with Tata Playleading with 21.43 million subscribers and Airtel DTH with 17.58 million subscribers.
- Despite such impressive numbers, annual forecasts are cautious due to the explosive growth of OTT after the lockdown. Even so, the PWC 2023-2027 report expects that by 2027, India will be the fourth-largest TV advertising market, growing at a CAGR of 6.4% to reach USD 6.5 billion by 2026.
- The EY/FICCI Frames report for 2023 presciently notes a decline in subscription revenues, with a marginal increase in advertising revenues still below 2019 prelockdown levels.
- A Deloitte forecast in its 2023 TMT predictions focuses on live sports, reaching USD 100 billion by 2027 from USD 27 billion in 2020. This holds out hope for Legacy TV, but as World Cup Football and World Cup Cricket showed, people are looking for free sports content on mobile, do not mind advertisements or paying for mobile data, which can completely upset traditional Legacy TV forecasts for future years.
- 2020 was the turning point for Legacy TV and Distribution networks, with few exceptions as OTT stormed to capture the viewing habits of millions of Indians.
- By the end of 2023, Disney-Star had signed a non-binding agreement to merge their operations in which Reliance will hold 51% through shares, and cash, and Disney will save 49%, based on CCI/MIB approval. The mega deal has been finalized in March 2024.
- While this merger would offer stiff competition to Netflix Amazon Prime could create a "cartel" in legacy TV with 136 Channels, which should worry the Competition Regulator and small Independent free-to-air channels.
- After a rocky two years of tumultuous merger proceedings, the Sony Zee merger, despite all approvals, has not been fructified.



- Tata Play has done what MSOs could have emulated a decade back. Tata Play will be a tall distribution Competition if it embraces the challenges of digital media.
- One view is that Legacy Broadcasters can focus on premium content catering to specific viewer segments, like sports, news, and regional language programming. Offering exclusive content and bundled Packages with OTT, platforms can also attract viewers. Unless Legacy TV and Distribution innovated their offerings with variety and depth, the danger of cord—cutting could cripple the existing industry.
- Luckily, at least for the foreseeable future, rural areas still favour Legacy TV over OTT platforms due to affordability and accessibility. Urban audiences, with significantly younger demographics, are shifting towards OTT. The acceleration of moving away will speed up unless the Legacy Industry reinvents itself, but that still needs to be evident as we enter 2024.

## OTT and User Generated Content has gate-crashed Legacy TV

- Key players like Amazon Prime Video, Netflix, Disney+Hotstar, Zee5, and SonyLiv dominate Indian OTT. The PwC 2023-2027 report highlights that the OTT market is growing significantly faster in India than the global average, providing a "lucrative landscape for domestic and international players."
- According to the PWC study, the revenue of Indian OTT Platforms are set to double, reaching \$3.5billion by 2027, from USD 1.8 billion at an Annual Growth Rate (CAGR) of 2027, outpacing the global OTT segment growth rate of 8.4%.
- Regional content is expected to be a significant driver, and 5G and broadband infrastructure improvements could unlock even more considerable market potential.
- The report forecasts ad-supported streaming becoming the new normal, with adsupported video on demand (AVOD) forecasted to account for 22.3% of OTT revenue by 2027.
- Among its key advantages is the extensive content offered by OTT platforms, catering to diverse preferences and allowing viewers to access an extensive library of movies and shows at their convenience.
- The convenience factor is a significant draw, as OTT platforms enable users to watch content anytime, anywhere, without the need to visit a physical location.
- Among the top OTT platforms, Netflix has stumbled in India after the initial excitement
  of vast content neatly organized for the Indian viewer, offering international content
  yet offering Indian content creators a worldwide reach. It is heavily investing in regional
  content and has developed mobile-friendly subscription packages.
- Amazon Prime has acquired vast regional content and invested in edgy local content originals with renowned filmmakers and actors. Disney Hotstar lost millions of viewers after losing lucrative IPL cricket rights. It promotes other sports like Pro Kabaddi,



Indian Super League, and Formula One.

- It also obtains high-quality regional content, and its Originals are top-rated. It also recently offered free mobile watching of the World Cup. A planned merger with Reliance in 2024 may help it recover its viewer base.
- As India's OTT market continues its explosive growth, OTT platforms must focus on regional content and address pricing concerns for sustained growth. The shift towards ad-supported streaming models and collaborations with regional players can further boost revenue streams. Foreign and Indian OTT platforms are shifting to adsupported programming, which will put off those interested in ad-free programming. AmazonPrime is already planning to offer ad-.supported and ad-free models, but how the highly price-sensitive Indian viewers' react, remains to be seen.
- New content regulations with elaborate self-control mechanisms but giving the Government power to interfere with edgy or politically sensitive content is bound to put foreign and Indian. Platforms on the backfoot. The stern content regulations introduced by the 2021 IT Rules are pending appeals in the Supreme Court and further tightening in 2022 and 2023 by the introduction of a three-tier self-regulatory mechanism, parental locks, accessibility mechanisms, and enhanced prohibition of harmful content can not only increase compliance costs but can have a chilling effect on freedom of expression, leading to Homogenisation of content.
- With the market set to reach new heights, the Indian OTT sector's evolution in 2024 and beyond is expected to be dynamic and transformative for India's economy.

## User Generated Content is the new Indian rage

- YouTube has approximately 467 million monthly users in India. It is said that 93% of Indian Internet users watch YouTube. Over 95% of content consumed by Indian YouTube viewers is regional. The most popular is T-Series Bollywood content, the most widely watched channel worldwide. Popular forms include vlogs, comedies, educational videos, tutorials, gaming content, music covers, lifestyle travel, and food channels.
- A distant second is Instagram, with 357.30 million users. It is most popular with young Indians, over 70% below age 34. Over 66% of viewers are male. With 11.7 hours per month on Instagram, India is the world leader. Cricketer Virat Kohli is the most popular Indian viewed on Instagram. They are most interested in personal growth, self-development, and running their businesses. Mumbai has the highest number of Instagram viewers.
- User-generated content has given rise to thousands of content creators, many of whom have become co-creators with world-famous brands.
- Viewer content has gained popularity through platforms like Patreon, enabling them



to receive funds directly from their viewers, allow the monetization of their work, and retain creative control. It is very popular with independent artists, musicians, writers and even travel and food vloggers.

- It has also given voice and freedom of expression to thousands of young Indians who otherwise would not find a viable mode of expression.
- Of course, the self-regulatory restrictions introduced through IT Rules 2021, amendments in 2022 and 2023, and the new Broadcast Bill 2023 could dampen their enthusiasm. Still, as they professionalize, they will take such roadblocks in their stride.
- The banning of TikTok for geopolitical reasons was traumatic for young content creators, but new short-form video platforms have come up and will draw back the content creators.

## New Trends in 2024

- AVOD Revenues to double: Revenue from ad-supported video on demand (AVOD) is set to nearly double. The streaming industry has switched to one that relies on advertising as a core revenue stream. (PWC Global Media Report 2023-2027)
- Blurring content and commerce: Beyond video ads, AVOD is already enabling different types of engagement, such as product placement and interactive ads. Some forms even offer shoppable functions that facilitate direct purchases, further blurring the lines between content and commerce (Kantar Media 24).
- The advent of FAST TV: Free, ad-supported streaming TV (FAST) services and digital networks of curated channels that are fully addressable and ideallysuited to targeted advertising will emerge. PWC Global Media Report 2023-2027)
- Gaming Revenue will spike: Games are coming into their own as a medium for creativity, consumer spending, and advertising. Total gaming revenue is expected to rise from US \$227 billion in 2023 to US\$ 312 billion in 2027, PWC Global Media Report 2023-2027).
- The allure of linear viewing continues: On-demand viewing continues to gain traction. Yet, the allure of linear viewing will remain strong, notably for significant events like the 2024 Paris Olympics and political elections (Kantar Media 24).
- Global Reach of Regional Content: The rise of streaming services like Netflix and Disney+ has amplified the global reach of regional content, from Japanese anime to Bollywood films. (Kantar Media 24)
- Al is everywhere, all at once: In 2024, we will see the media landscape for better or worse – make much deeper integrations of Al technologies, deploying test-and-learn methodologies. (Kantar Media 24).
- Al-powered Storytelling: News stories or movies written and directed by Al and adapted to real-time audience preferences can lead to "personalized narrations,"



dynamic plotlines, and hyper-realistic visuals."

- Micro-content Boom: Short-form, snackable content platforms like Instagram Reels and YouTube Shorts have gained immense popularity. There will be more innovative formats like interactive polls, quizzes, and bite-sized documentaries.
- Cross-cultural Collaborations: In the future, Bollywood dancenumbers could be filmed in the Metaverse with global artists or Indian musicians collaborating with K-Pop stars.
- Interactive Storytelling: Media can become more participatory, allowing viewers to influence storylines, vote on character decisions, and create alternate endings. This could transform traditional narratives into dynamic, audience-driven experiences.
- Greater Focus on Regional Languages: With the rise of regional OTT platforms and increasing internet penetration in rural areas, new content could give voice to underrepresented stories and connect with diverse audiences.

As we have entered 2024, content choices will only increase. People will consume content in various forms, with mobile remaining the most popular. New forms of audience engagement will happen in all forms of communication due to the growing attraction of connected TVs. The smart TV market is estimated to be worth USD 9.88 billion and is expected to grow at a CAGR of 16.7% from 2023 to 2030.

The fast spread of 5G by Jio/Airtel has speeded up sales. Reliance Jio has announced its own Operating System development. HD TV amounts to 53% of current sales. This will improve data analytics for targeted programming and advertising and predictive analysis using AI. Will Legacy TV survive the Digital media onslaught? If Legacy TV becomes more targeted in customer approach and DTH and Multi System Operators offer various multi-services, including Legacy TV, OTT aggregation, High-Speed Broadband, and Home Security, they will be going strong at the end of this decade.

Sources: IABM, PWC, EY, Kantar Media 24.







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**ANNEXURE** 

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28th International Conference & **Exhibition on Broadcast & Media** Technology

02024 Theme: Evolving Media Ecosystem: Innovative, Immersive & Sustainable Broadcasting

15-17 February | Hall 12A, Pragati Maidan, New Delhi

TV. RADIO. FILM. MOBILE. OTT. IPTV. **CONTENT CREATION . DELIVERY** 










### **AIRWAVES SYSTEMS PVT. LTD.**

Stand No.: E4

Company Address : Emerald Plaza, Emerald Plaza Offices, EPO-05-041, Unit No. 541, 5th Floor, Sector-65, Golf Course Extn Road, Gurugram-122018 (Haryana)

Phone No. :+917011090593

Email Id : ashish@airwavessystems.com

#### Display Profile:

Airwaves Systems Pvt. Ltd based in Gurugram (NCR), who is into Distribution & Integration for Professional Audio, Video Broadcast, AV Systems & Integration to meet the exact needs of FM Radio, Satellite TV Channels, Regional TV Channels, Community Radio Stations & AV customers in India.

Airwaves Systems offers the best products & solutions from world renowned brands, i.e. Digigram (France), Auvitran (France), Harman International (India Pvt. Ltd (USA), RFE Broadcast (Italy), D&R (The Netherlands), Junger Audio (Germany), Telos (USA), Behringer & Compatible Power (India) for Professional Audio, Video, and Broadcast & AV equipment catering to Government & Private organizations including repair service & support for digital audio console and other audio equipment.

### **ASTECH SYSTEMS PVT. LTD.**

Stand No.: D1

Company Address: 16,1st Floor Community Centre, East of Kailash, New Delhi-110065

Phone No. :+911141604634

Email Id : support@broadcastauto.com

#### Display Profile:

Astech Systems Pvt Ltd is a pioneer in developing automated systems for the media Industry. It covers entire range of from backend Broadcast MIS systems to complete automated graphics delivery and media monitoring solutions and cloud-based services.

Contact Person : Jagdish Misra

Phone No. : +91 7982424523

Email Id : mkt@smartcop.in

### **BROADCAST ENGINEERING CONSULTANTS INDIA LIMITED**

Stand No.: C2

#### Display Profile:

Broadcast Engineering Consultants India Limited (BECIL) an ISO 9001:2015, ISO 27001:2013, ISO/IEC 20000-1:2018 and CMMIL3 certified, a Mini Ratna Central Public Sector Enterprise (CPSE) was incorporated on 24th March, 1995 under the Companies Act, 2013 (erstwhile the Companies Act, 1956) by Government of India with 100% equity share capital of BECIL held by President of India through Secretary and Joint Secretary of Ministry of Information & Broadcasting. The Company was initially set up for providing project consultancy services and turnkey solutions encompassing the entire gamut of radio and television broadcast engineering, establishment of transmission facilities i.e content production facilities, terrestrial, like satellite and cable broadcasting in India and abroad.

The company has now diversified into the fields of Strategic Projects such as Information Communication Technology, Electronic Surveillance (namely CCTV, Access Control, Intrusion, Fire Safety, Hydrants, etc.), Electronic Media contents including films, Sentinel Analytics, Counter Drones/UAV etc. The activities include but are not limited to Supply, Installation, Testing & Commissioning, Consultancy Services, Technical Audit, Media Analysis, R&D, projects pertaining to Digital India, City Surveillance, Safe City, Smart City, Make in India, Made in India, Manufacturing, Audio Video & Data Analysis, Cyber Security, Engineering, Procurement & Construction, Project Management Services, Operation and Maintenance, Manpower Placement, AMC and providing the total turnkey project for the critical information infrastructure. BECIL has its Head Office in New Delhi, Corporate Office in Noida and Regional Office in Bangalore and Kolkata. BECIL is exploring geographical expansion in many states due to diversification in business portfolios.

Over the years, BECIL has consciously groomed and developed a team of in-house, versatile, and dedicated engineers and also cultivated and harnessing a vast reservoir of professionals drawn from various fields of Broadcasting Industry which includes public and private Broadcasters, Defence and Cable Industry. Through this network of resourceful technical professionals, BECIL has established its pan India presence to serve the needs of the industry. BECIL has a vast reservoir of experts and integrates the expertise of All India Radio (AIR) and Doordarshan (DD), the national broadcaster of India, creating one of the largest Radio Networks catering to more than a billion people and the world's largest Terrestrial Television Network supplemented by Analogue and Digital satellite Broadcasting services reaching out to millions of TV homes in India and abroad.

Contact Person	: Harmohan Sharma, AGM (Admin)
Phone No.	: +91 8130558217
Email Id	: harmohan@becil.com



Stand No.: D5



### **BROADCAST & CABLESAT**

Company Address : C-35, Sector-62, Noida – 201307 (Uttar Pradesh)

Contact Person : Neha Rathor

Phone No. : +919810422047

EmailId

: neha.rathor@adi-media.com

#### Display Profile:

Broadcast & CableSat provides a direct interface between buyers and manufacturers/marketers of broadcast, cable, and satellite equipment. It is India's premier magazine on content production and distribution. Drawing on its strength of aggressive and comprehensive reporting, with editorial contribution from business thinkers, the magazine is a referral for the Indian broadcast, satellite, and cable community.

The web portal, www.broadcastandcablesat.co.in, is positioned as a preferred source for equipment buyers searching for vendors and product information. The portal provides an opportunity for vendors to build brand image, provide live business information, and generate customer leads. Other online promotions include weekly newsletters, EDM blasts, and e-zine versions of the magazine.

Contact Person : Firoz Khan

Phone No. : +91 9350590707

Email Id : circulation@adi-media.com

### **BROADCAST INDIA SHOW 2024**

Stand No.: D7

Company Address : 312/313, A wing, Dynasty Business Park, Andheri Kurla road, Andheri East, Mumbai 400059

Phone No.

: +919945826440/9945826427

Email Id

: pranali.raut@nm-india.com/varun.gaba@nm-india.com

#### Display Profile:

Two of the most significant shows of the Indian media and infotainment industry - Broadcast India Show and SCAT India Show – along with the Content India Show - come together as A.B.I.S (Asia's Broadcasting & Infotainment Show), giving us South Asia's largest exhibition in the world of broadcast and infotainment. To be held from 17 - 19 October 2024 at the Jio World Convention Centre in Mumbai, we aim to bring together the entire Indian infotainment ecosystem – from production, postproduction to management, delivery, distribution, and content creation – to showcase innovation and disruptive technologies in the infotainment and media sector by converging industries.

Under the A.B.I.S. umbrella, products and services across categories, genres and technology would be showcased, through the latest innovation in production, post-production, management, syndication, licensing, and distribution. Expect a plethora of workshops, conferences, seminars, exhibits, product launches, live demos, networking platforms, panel discussions and knowledge exchange forums, all under one roof.

Contact Person	: Pranali Raut
Phone No.	: +91 9945826440
Email Id	: pranali.raut@nm-india.com



Stand No.: B2

### **CANARA LIGHTING INDUSTRIES PVT. LTD.**

Company Address : Mulki-Kinnigoli Airport Road, Punaroor, Mangalore 574150

Phone No. : +918242290618/313

EmailId : info@canaralighting.com

#### Display Profile:

Canara Lighting is the global leader in the business of providing broadcasting and TV studio lighting system for over 50 years. They are the biggest manufacturer of specialised lighting equipment in South Asia. Their World-Class manufacturing facility is located at Mangalore, India. Canara provides one stop service from concept to commissioning. This includes consulting, designing, manufacturing, Research & Development, installation, commissioning, training & after sales service. Canara provides complete turnkey solution for TV studios. Product range covers latest technology LED lighting fixtures, grid & rigging equipment (both fixed & motorised), cable management system, electrical panels, and lighting consoles. Their products are in line with Int'l standards & are CE certified.

Contact Person : Mr. Sachin Pawar

Phone No. : +91 87500 67142

Email Id : sachin@canaralighting.com

# CDM TECHNOLOGIES AND SOLUTIONS PVT. LTD.

Stand No.: E2

Company Address: A83 Pocket D Okhla phase 2 New Delhi -110020

Phone No. : +911142638666

Email Id : Akhilesh.g@cdmts.com

Display Profile:

CDM Technologies and Solutions helps broadcasters/Television service providers, AV Solutions & IT products to solve their most vexing problems.

Contact Person : Akhilesh Gupta

Phone No. : +91 8053002289

EmailId : Akhilesh.g@cdmts.com

International Principals:

Vizrt, USA BirdDog, Australia ClassX, Italy Konvision, China Avmatrix, China Kiloview, China



### **CINEMATOGRAPHY ART**

Stand No.: D6

Stand No.: All

Phone No. : +919910161695

: naresh.sharma@cinematographyart.org

Display Profile:

EmailId

Cinematography art is quarterly Magazine getting published for last 10 Years about Indian Cinematographers and Cine equipment used in the Cinema Industry

Contact Person : Naresh Sharma

Phone No. : +91 9910161695

EmailId : naresh.sharma@cinematographyart.org

# **CRONUS PRO INDIA PVT. LTD.**

Phone No.

: +919310196630,8860807646

EmailId

: jitender.kardam@aaamedia.co.in

#### Display Profile:

Cronus Pro India Pvt Ltd, a leading broadcast equipment manufacturing company based in New Delhi! We specialise in designing and producing a wide range of equipment, including teleprompters, tripods, video lights, telephone hybrids, and various accessories.

Cronus Teleprompters: Our teleprompters offer exceptional clarity and readability, allowing presenters to deliver their scripts effortlessly. Whether it's a newsroom, a live event, or a studio production, our teleprompters are the perfect companion for professionals in the broadcasting industry.

Tripods: Our tripods are engineered to provide maximum stability and smooth movement, ensuring precise control over camera angles. Built with durability in mind, our tripods are capable of withstanding demanding environments, making them an ideal choice for both indoor and outdoor shooting scenarios.

Video Lights: Our video lights are designed to deliver consistent and adjustable lighting, allowing you to create the desired atmosphere and highlight the subject with utmost clarity.

Telephone Hybrid: Our telephone hybrids enable seamless integration of phone calls into your broadcasts, ensuring clear and reliable communication.

Contact Person : Vishal Singh Phone No. : +91 8585978923 Email Id : sales2@aaamedia.co.in



Stand No.: C1

Stand No.: A12

### **DRM DIGITAL RADIO MONDIALE**

Company Address : The Digital Radio Mondiale Association, c/o European Broadcasting Union, L'Ancienne-Route 17A, 1218 Le Grand-Saconnex, Switzerland

Phone No. : +44 7864 353427

EmailId : projectoffice@drm.org

#### Display Profile:

The DRM (Digital Radio Mondiale) Consortium is an international not-for-profit organization with the aim a to make the universal, openly, ITU-recommended DRM standard widely accepted for all its features and benefits shared across all broadcast bands and to see it implemented at local, regional, national, and international level.

The DRM Consortium has about 100 members globally which includes some of the most knowledgeable experts on DRM and digital radio.

For joining the Consortium and more information and DRM updates please visit www.drm.org or write to projectoffice@drm.org.

Contact Person : Yogendra Pal

Phone No. : +91 98115 72044

International Principals:

DRM Consortium, Switzerland CML Microcircuits, UK Fraunhofer IIS, Germany NXP India, India Rfmondial, Germany Starwaves, Switzerland

# **ELENOS GROUP**

Company Addres	s : Via Amendola 9, Poggio Renatico, Ferrara, 44124 , Italy
Phone No.	: +390532829965
EmailId	: info@elenosgroup.com
Display Profile: World Broadcasti	ng leader in manufacturing FM/TV transmitters and digital modulators.
Contact Person	: Carrà Mattia
Phone No.	: +393483630236
EmailId	: m.carra@elenosgroup.com



Stand No.: D4

### FOR-A INDIA PVT. LTD.

Company Address : Unit no-800, 8th floor, WT tower-B Sector-16 Noida U.P. 201301

Phone No. : +91120-4238674,9873500960

Email Id : nitin@for-a.co.in

#### Display Profile:

For-A India Private Limited (formerly AGIV India Pvt. Ltd.) is one of the largest agency houses representing / distributing Broadcast & media Equipment since last four decades and, also a leading system Integrator in India providing Broadcasting, Media, and Communication solution to Indian and neighbourhood countries for Broadcasting houses, Media houses and educational Institutions with a major thrust on video equipment. Its endeavour is to help end users in capturing events with confidence and trust. It is a 100% subsidiary company of FOR-A Company Limited, Japan.

Contact Person : Nitin Garg

Phone No. : +91 9873500960

EmailId : nitin@for-a.co.in

International Principals:

For-A Co. Ltd., Japan Leader Electronics Corp., Japan

# INNOVATIVE INFRATECH SOLUTIONS PVT. LTD.

Stand No.: B4

Company Address : Plot No.3, First Floor, Signature Tower, Tower No.3, Sector- Knowledge Park 3, Greater Noida, Gautam Buddha Nagar, Nagar, Uttar Pradesh, 201308

Phone No.

: +919990707081

EmailId

: narendra@infratech.in

#### Display Profile:

IISPL leading original equipment manufacturers of Osel Brand LED signage display systems under make in India. We make a full range of LED display panel systems at our ultra-modern plant in Greater Noida, in Delhi NCR. We are awarded Startup of the Year Award in 7th National MSME Summit by Honourable Union Cabinet Minister Shri Nitin Gadkari in 2020.

Contact Person : NK Shukla

Phone No. : +91 9990707081

Email Id

: narendra@infratech.in



Stand No.: B1-A

# **INNTOT TECHNOLOGIES PVT. LTD.**

Company Address : Jyothirmaya, Infopark Phase - II Special Economic Zone, Brahmapuram P.O, Kochi, Kerala, India - 682303.

Phone No. : +91484-2985898

EmailId : info@inntot.com

#### Display Profile:

Inntot is a Deep Tech Company with SDR IP Solutions for Digital Radio Mondiale (DRM in AM and FM bands) Receivers, DAB/DAB+ Receivers, HD-Radio, CDR, ISDB-T and is all set to play a pivotal role in the Analog Sunset of AM and FM broadcast radio transmission paving way to Digital Radio Transmission.

Contact Person	: SreeprakashTK
Phone No.	: +91 9986003749
EmailId	: sree.tk@inntot.com

### **INOVONICS INC.**

Stand No.: E5

#### Company Address : Felton, California-USA

EmailId : mukesh@inovonicsbroadcast.com

#### Display Profile:

For over 50 years, Inovonics has maintained its position as a market leader of cost-effective and innovative radio broadcast products. Inovonics specializes in professional broadcast quality Audio Processors, AM/FM Modulation Monitors, RDS Encoders, and off-air monitoring equipment for AM/FM/HD Radio/DAB+/RDS/Internet Radio.

Inovonics enjoys its leadership by having dealers and distribution network in more than 110 countries throughout the world. Inovonics, the broadcasters' choice for essential radio broadcast is pleased to present new products at BES 2024.



### **EXHIBITORS DIRECTORY**

# KARTHAVYA TECHNOLOGIES & DISK ARCHIVE CORPORATION

Stand No.: E1

Company Address : #26, HMR Building, 2nd Floor, Annaiah Reddy Layout, Ramamurthi Nagar Main Road, Doddabanaswadi, Bengaluru, India 560043

One Horseshoe Park, Pangbourne, Berkshire, RG87JW, United Kingdom

Phone No. Email Id : +919986511065, +441183290121 : sunil g@karthavya.com/no more tapes@diskarchive.com

### Display Profile:

We at Disk Archive Corporation, specialize in cutting-edge, high-availability, high-security enterpriseclass archives and content libraries designed for the film, television, and legal evidence market. Trusted by Broadcast, Media, and surveillance companies, Producers, Distributors, and Archives worldwide, ALTO systems thrive in the most challenging environments, with over 400 systems in daily use.

A pioneer in developing cutting-edge media and news workflow solutions leveraging open platforms, Karthavya Technologies is a Broadcast Technology firm with its headquarters in Bangalore, India. Karthavya is backed up by one of the industry's biggest research and development team which is the driving force behind innovative technology solutions offered under the umbrella of the brand Karthavya.

Karthavya's portfolio of products focused on Broadcast automation includes:

BLAZE - Newsroom Computer System (NRCS)

QuickEdge - Playout and Ingest Automation

DataHeart - Hierarchical Storage Management (HSM) and Archival

Contact Person: Sunil G / Bhavik VyasPhone No.: +91 9986511065 / 9619075374Email Id: sunil\_g@karthavya.com / bhavik.vyas@diskarchive.com

### LAMHAS SATELLITE SERVICES LIMITED

Stand No.: B2-C

Company Address : Tower No.1, 6th Floor, International Infotech Park, Above Vashi Rly. Station, Vashi, Navi Mumbai, Maharashtra 400703

Phone No. : +9111-46057398

Email Id

: sales@lamhas.com

#### Display Profile:

Lamhas has been a pioneer player in providing innovative solutions in the Media, Satellite, Broadcast, Video over IP Distribution segments for almost two decades. Lamhas offers services across India and is trusted by more than 300+ National & International broadcasters and corporations.

Few of the services offered by Lamhas are, TV Channel Uplink, DSNG, Broadcast System Integration, Backpack Solutions- LiveU, Live Streaming Solutions, Video Distribution, Satellite IoT, Satellite Imaginary and other associated services. Lamhas have Teleport facility & offices in Mumbai & Hyderabad and Sales office in New Delhi.

Contact Person : Uzair Ali Jafri

Phone No. : +91 8586090149

Email Id : u.jafri@lamhas.com

International Principals:

LiveU, Israel WiseDV, USA SparkUp, France Celerway, Norway



# LEKSA LIGHTING TECHNOLOGIES PVT. LTD. Stand No.: E3

Company Address : Badaga Mijar, Ashwathpura Road, Moodbidri, Mangalore - 574227

Phone No. : +918951579168

EmailId : meshak@leksalighting.com

#### Display Profile:

Established in 2017 in Mangalore, in 5 years, Leksa has become one of the leading manufacturer and suppliers of Professional lighting in Southeast Asia dominating the lighting scene in broadcasting fields such as TV studio, Film and Fiction shoot industries, Auditorium, Architectural and other verticals. A highly professional team with motto "Respect for people and Teamwork" under the leadership of Mr Ronald Silvan D'Souza – Executive Director; in a short time Leksa has executed projects all over India and presence across 17+ countries with one of the largest manufacturing facilities having over 300 specialized lighting produced with over 250+ employees.

Contact Person	: Mr Meshak Clarance
Phone No.	: +91 8951579168
Email Id	: Meshak@leksalighting.com

# MARK INTEGRATION & TECHNOLOGY SOLUTIONS LLP

Stand No.: B6

Company Address : 205 Vardhman Sunrize Plaza, Vasundhara Enclave, Delhi-110096

#### Phone No. : +919810017432,9968296792

EmailId : harkesh.gupta@markintech.com; info@markintech.com

#### Display Profile:

Mark is a company founded and managed by Broadcast Engineering veterans, having vast experience of five decades in Radio Broadcasting in All India Radio, BECIL and Private industry, with an aim to serve the Radio Broadcasters by providing customized and cost-effective solutions. We supply, install, and provide consultancy for complete range of equipment and infrastructure for Public, Private and Community FM Radio Broadcasters. We are manufacturer and importers of FM Radio equipment from our foreign partners. The company is celebrating 10 glorious years of its sustained growth from 2014-2024.

For further details about Mark, you may visit our website www.markintech.com.

Contact Person : Mr. R.C. Bhatnagar, Vice President

Phone No. : +91 9968296792

Email Id : info@markintech.com

#### International Principals:

Belco S.R.L., Italy Electrolink S.R.L., Italy A.E.V. Broadcast S.R.L., Italy



### **MONARCH SOFT TECH LLP**

Stand No.: D2+D3

Company Address : Shop no. 1-C, Ground Floor, Laxmi Commercial Centre, Jayprakash Road No.1, Goregaon East, Mumbai - 400 063.

Phone No. : +917021023643

EmailId

: parth.satra@monarchsofttech.com

#### Display Profile:

Monarch is a leading IT Solutions provider in the Media Technology space that has been serving the Broadcast, Video & Imaging industry enabling professionals to experience its custom-built, innovative solutions in the Broadcast segment.

We provide complete Live Sports Production Services under one roof using cutting edge technology for events like Live Sports Scoring graphics, Election graphics, Live Production, PostProduction, Live Streaming, Drone Augmented Reality graphics, Live Relay on LED wall, Augmented Reality Virtual Studio, Extended Virtual Set.

#### EZYCG

Monarch EZY CG is a customized CG software (On Air Graphics System) designed especially for Elections, Live Sports scoring, Weather and other events where dynamic data is fired.

#### EMEECAST

Monarch redefines the concept of multi ME switcher by introducing Emee Cast.

Monarch Emee Cast is suitable for debate and talk shows where multiple PIP windows can be composed simultaneously on the single screen all at once.

Virtiset WOW-Tracking and Trackless Virtual Studio Solution

Virtiset Wow is a new generation virtual studio solution with the ability to use as tracking and trackless virtual studio in a single system. It is integrated with data driven Augmented reality, Extended Reality set & photo realistic graphics.

#### Edit Expert

Edit Expert is a feature rich professional video editing application to edit and enhance videos quickly and easily - it is a turnkey solution with complete workflow from rough cuts to final program for television studio.

Contact Person : Parth Satra Phone No. : +91 70210 23643

-91 /021023643

EmailId

: parth.satra@monarchsofttech.com



Stand No.: A4

# **NAUTEL LIMITED**

Company Address: 10089 Peggy`s Cove Rd, Hackett's Cove, NS B3Z 3J4, Canada

Phone No. : +1902-823-2233

EmailId : support@nautel.com

Display Profile:

Nautel is the world's largest manufacturer of AM and FM radio broadcast transmitters with key contributions in the field of digital broadcasting. Focused on making transmission worry-free for users worldwide, Nautel transmitters employ advanced control, monitoring, and instrumentation tools which simplify management of transmitter sites, both locally and remotely via web access. More than 20,000 Nautel transmitters have been deployed in over 177 countries since 1970 – transmitters that meet stringent quality standards at our ISO 9001 registered manufacturing facilities in U.S.A. and Canada, and perform in harsh climates ranging from arctic, to desert, to jungle. For more information visit www.nautel.com

Contact Person	: Vishwajeet Chauhan
Phone No.	: +91 9718885972
EmailId	: vishwajeet.chauhan@nautel.com

# **NIKITA DISTRIBUTORS**

Stand No.: B8+B10

Company Address : FL-1B, Plot No.410/2, Green Terrace, Near Vidyut Nagar, Lane No.5, South Koregaon Park, Pune 411001, MH, India

Phone No. : +919421583777

EmailId : devendra@imaginext.co.in

Display Profile:

Nikita Distributors is devoted to bringing the latest technology to India. It is a company set up especially by the Nikita Group to focus mainly on the Indian market and capitalize on the trends in one of the fastest-growing economies in the world. Through our parent company, we have a very extensive sales channel distribution in place and our products are available pan-India.

Contact Person	: Eesh Dewan / Amit Vohra
Phone No.	: Eesh Dewan - 98117 04707 / Amit Vohra - 92687 59295
EmailId	: eesh@imaginext.co.in/amitv@imaginext.co.in



Stand No.: B3+B5

Company Address : C-34, Sector-62, Electronic City, Noida-201307 (UP), India.

Phone No. : +91120 2400780

EmailId : nikhild@planetc.net

#### Display Profile:

We are the world leaders in broadcast technology with over two decades of experience in servicing some of the world's leading brands, including one of the most valuable sporting leagues, the IPL. As the only teleport provider in Asia with multiple locations, we cater to over 300 channels. Our comprehensive suite of products and services covers content preparation, post-production, traditional and cloud playouts, IP distribution, OTT platforms, and FAST channel services. We promise to meet all your ever-evolving distribution requirements.

Our range of services includes acquisition, channel creation, playout, distribution, OTT, and postproduction. We remain committed to staying at the forefront of cutting-edge technology, offering an advanced cloud-first media suite backed by our own Media Asset Management solutions. This combination ensures seamless playout and post-production, making Planetcast the ultimate onestop solution for all your broadcasting needs.

At Planetcast, we showcase our technological prowess through our state-of-the-art infrastructure, meticulously engineered to facilitate flawless media distribution across television and digital platforms. With Planetcast, your content has the power to transcend boundaries and reach new heights, captivating audiences around the world.

Contact Person: Nikhil DuttaPhone No.: +91 9873643998Email Id: nikhild@planetc.net

### **PRASAR BHARATI**

Stand No.: A2

Company Address : O/o ADG(R&D), Research Department (R&D), 14-B, I P Estate, Ring Road, New Delhi-110002

Phone No.

: +911123378211

#### Email Id

**Display Profile:** 

: rdairdd@prasarbharati.gov.in/rdairdd@gmail.com

Prasar Bharati, India's Public Service Broadcaster, was established under the Prasar Bharati Act, 1990, and came into existence on 23rd November 1997. Its mandate is to organize and conduct public broadcasting services in the country -- to inform, educate and entertain, and to ensure balanced development of broadcasting on radio and television. Over the years it has worked tirelessly to fulfil its statutory mandate as enshrined in the Prasar Bharati Act.

Akashvani (All India Radio – the radio network) and Doordarshan (the Television network) are its constituents. Prasar Bharati also operates DD Freedish, the only free Direct to Home service which is the largest distributed DTH platform in India. Prasar Bharati also reaches out to its audiences through digital platforms and operates the NewsOnAir App as well as Prasar Bharati News Service which are its digital services in tandem with its nationwide and multilingual Broadcast Services.

Contact Person	: Md Javed Shams
Phone No.	: +91 9718691037
EmailId	: mohammadjavedshams@prasarbharati.gov.in



Stand No.: C4

### **QUALCOMM INDIA PVT. LTD.**

Company Address : 01 to 17, IT-ITES SEZ, KRC Tower, Commerzone SEZ in M/s. Sustain Properties Pvt. Ltd. 16/A/1/P and 16/A/2/P,Sy No. 83/1, Knowledge City, Raidurg, Serilingampally Mandal, Ranga Reddy – 500081 Telangana, India

Phone No. : +917259700340

Email Id : mthangel@qti.qualcomm.com

#### Display Profile:

Qualcomm enables a world where everyone and everything can be intelligently connected. We are efficiently scaling the technologies that launched the mobile revolution to the next generation of connected smart devices.

Contact Person	: Mahendar Reddy Thangella
Phone No.	: +91 7259700340
EmailId	: mthangel@qti.qualcomm.com

# SAANKHYA LABS PVT. LTD.

Stand No.: B7

Company Address : Embassy Icon, 3, Infantry Rd, Vasanth Nagar, Bengaluru, Karnataka 560001

Phone No. : +918061171000

Email Id : info@saankhyalabs.com

#### Display Profile:

Saankhya Labs is a premier wireless communication and semiconductor solutions company, that have designed and developed a full spectrum of next-gen communication solutions for the present and the future, that include products and solutions for broadband, satellite and broadcast applications including 5G NR, Direct To Mobile (D2M) Broadcast, rural broadband connectivity, satellite communication modems for IoT applications and multi-standard DTV modulators and demodulators.

Established in 2006, we are India's first fabless semiconductor solutions company, having developed the world's first production Software Defined Radios (SDR) chipsets. Our products and solutions are powered by our award-winning, patented, ultra-low power consumption, fully programable SDR chipsets.

Contact Person: Krishna KishorePhone No.: +91 9741811022Email Id: krishna.kishore@saankhyalabs.com





Company Address : R-401, 4th Floor, Remi Biz Court, Shah Industrial Estate, Veera Desai Road, Andheri (west), Mumbai - 400053

Phone No. : +919987485555

Email Id : pskohli@shaf.in

#### Display Profile:

Shaf Broadcast Pvt. Ltd is a System Integration & Services provider, has been delivering pioneering Broadcasting & Transmission solutions since 1993. Shaf currently has a nationwide network of sales and support offices that provide Consultancy, Analysis and System Design, Project Management & Planning, Visualization and Building design, Equipment sourcing and performance testing, Integration and Software configuration, On-Site Installation, Acceptance Testing, Technical Documentation, Commissioning & Training, Broadcast Centers, Television Channels (News, Entertainment, Sports & Music), Film & Video Post-Production Studios, Special Effects & Animation Houses, Digital Intermediary Facilities, Education Institutes through its vast experience garnered from the past along with our loyal and large customer base, has continued to grow exponentially since 1993.

Contact Person	: MKAyyappan
Phone No.	: +91 98104 46823
Email Id	: ayyappan@shaf.ir

### SUN BROADCAST EQUIPMENTS PRIVATE LIMITED

Stand No.: C10

Stand No.: B1

Company Address : Sun House, 2/5, West Patel Nagar, New Delhi – 110 008

Phone No.

: +911149808900

Email Id Website : bpp@sungroup.net : www.sungroup.net

#### Display Profile:

Sun Broadcast Equipments Pvt. Ltd. a part of Sun Group was established in Feb 2003 in Delhi and has been representing many renowned audio brands Sony, Zeiss, Wacom, Autoscript, Autocue, Sachtler and Vinten Distributor in India. Having extensive dealer / System Integrator network, with strong experience in the Video and audio segment, Sun broadcast has been providing complete end to end Turkey solutions to customers.

With a dedicated team of Sales and Marketing Personnel's, Engineers and fully equipped Service Centres located in Delhi, Mumbai and Chennai, Kolkata, and Hyderabad. Sun Broadcast has been providing complete customer support. In association with different OEM's Sun Broadcast has also been conducting training and product awareness programmes with Customers.

Contact Person	: Rashmi Prakash Panda
Phone No.	: +91 9810275445
Email Id	: rpanda@sungroup.net



### SUN INFONET PRIVATE LIMITED

: info@sungroup.net

Company Address : Sun House, 2/5, West Patel Nagar, New Delhi – 110 008

- Phone No. : +911149808905/35
- EmailId

EmailId : www.suninfonet.net

#### Display Profile:

Sun Infonet Pvt. Ltd. a part of Sun Group was established in July 1999 in Delhi and has been representing many renowned audio brands Shure, Allen & Heath, Quest Engineering, Audio Focus and Meyer Sound as Master Distributor in India. Having extensive dealer / System Integrator network, with strong experience in the audio segment, Sun Infonet has been providing complete audio solution to the customers.

With a dedicated team of Sales & Marketing Personnel's, Audio Engineers and fully equipped Service Centres located in Delhi, Mumbai and Chennai, Sun Infonet has been providing complete customer support. In association with OEM's Sun Infonet has also been conducting educational training programmes for the partners and end-users on regular basis.

Contact Person : Hemant Gaba

Phone No. : +91 8860333309

EmailId

: hemant@sungroup.net





### **TECHNOMEDIA SOLUTIONS PVT. LTD.**

Stand No.: A12

Company Address : Unit No. 12-14, UG Floor, Tower -1, Assotech Business Cresterra, Plot No. 22, Sector-135, Noida-201304, Uttar Pradesh

Phone No. : +911205185722/23/24

Email Id

: contact@technomediaindia.com

#### Display Profile:

Solutions Pvt Ltd, established in the year 2002, is one of the leading end-to-end system solution providers for the Radio and Television Media industry. The services offered by the Company are right from planning and conceptualization to the installation, integration, and commissioning on a turnkey basis. The company has pioneered in creation of Common Transmission Infrastructure (CTI) for setting up Pvt. FM stations involving site selection, designing, specification formulation, tendering, negotiating, building, installing, commissioning and field strength surveying etc.

Technomedia, with its Research and Development arm, develops various products for the electronic media industry. One of the products is Transmitter Monitoring and Control System (TMCS) for remote monitoring and control of transmission systems.

Technomedia also provides Facility Management services for Studio and Transmission system to various FM Broadcasters across India for their 24x7 operations. A division of Technomedia is responsible for doing Coverage Planning and providing onsite training.

Our Esteemed Customers include Entertainment Network (India) Ltd.-Radio Mirchi, South Asia FM Ltd-Red FM, Kal Radio Ltd – Red FM, Malar Publications Ltd-Hello FM, Music Broadcast Ltd - Radio City, DB Corp Ltd-My FM, Abhijit Realtors & Infraventures Pvt Ltd-Radio Orange, Reliance Broadcast Network Ltd-Big FM, Malayala Manorama Ltd-Radio Mango, Mathrubhumi Co. Ltd-Club FM and Thanthi Group-Thendrel TV and Thanthi TV.

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International Principals:

Broadcast Electronics Inc., USA Comrex Corporation, USA Elenos S.R.L., Italy Itelco Broadcast S.R.L., Italy V-Soft Communications, USA



### VISUAL TECHNOLOGIES INDIA PRIVATE LIMITED

Stand No.: A1

Company Address : D - 350, Sector - 63, Noida - 201307, Uttar Pradesh, India

Phone No. : +91120 2471000

Email Id : vtidel@vtipl.com

#### Display Profile:

Established in 1996, Visual Technologies is one of the leading suppliers & System Integration companies in the Broadcast, Education, AV and Security Surveillance Industry. VTI is a distributor for more than 45 global and Indian brands to market and distribute their Professional Audio / Video Broadcast Equipment. Subsequently, over the years, VTI has diversified its activities into Design, System Integration & Configuration and commenced undertaking Turnkey Projects. VTI aims to become a one-stop-shop for all Professional Audio / Video requirements.

VTI is ISO 9001-2015, ISO/IEC 27001:2013, ISO 14001:2015, ISO/IEC 20000-1:2018 Certified company in the Broadcast Industry in India, dedicated to providing its customers with an uncompromising level of service and long-lasting support.

Built around the core commitment to excel, VTI is driving marketing innovation in the Professional Audio-Video Broadcast Equipment, across India. In everything we do, we weave in the triad of Precision, Perfection, and Passion.

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International Principals:

Hitachi, Japan Canon, India Panasonic, India Ross Video, Canada Haivision, Canada Datavideo, India CueScript, UK TSL, UK

### **XPERI INC.**

#### Stand No.: A3

Company Address : 2190 Gold Street, San Jose, California 95002 USA Phone No. : +1408 519 9100

#### Display Profile:

At home and on the go, for millions of people around the world, Xperi elevates content and how audiences connect with it in a way that is more intelligent, immersive, and personal. To meet rising consumer expectations for high-quality, seamlessly integrated experiences, we work with partners across the digital value chain to align ecosystems and support connected homes, connected cars – and our connected lives. Our solutions are powered by a combination of advanced technologies from our leading brands. DTS®, HD Radio, IMAX® Enhanced and TiVo® are the names consumers turn to for extraordinary experiences every moment of the day.

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# BES EXPO 2024 GOVERNING COUNCIL



**Left to Right:** Mr. Rajeev Kumar IBES (Governing Council Member), Mr. Prem Shanker Srivastava IBES (Governing Council Member), Mr. Ashok Kumar Jha IBES (Governing Council Member), Mr. Aftab Ahmed IBES (Honorary Secretary), Mr. Sunil IBES (President BES), Mr. Om Prakash Rajpurohit IBES (Hon Treasurer), Mr Surender Singh IBES (Governing Council Member), Mr. I I George IBES (Past President BES) and Mr. K K Rao IBES (Governing Council Member).

**Not in pic :** Mr. Dinesh Pratap Singh IBES (Governing Council Member), Mr. P Das IBES (Governing Council Member), Mr. Aditya Chaturvedi IBES (Governing Council Member) & Mr. Prakash Veer IBES (Governing Council Member).

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All India Broadcast Manufacturers And Distributors Association



