**ITU - TRAI International Training Programme**
**on**
**"Emerging Trends in Broadcasting"**
**09 -11 October 2019**

**New Delhi, India**

# OUTCOME REPORT

The ITU-TRAI International Training Programme (ITP) on "Emerging Trends in Broadcasting" was organized from 9th -11th October 2019 in New Delhi, India which was supported by ITU-Department of Communications and the Arts (Australia) under a project.

The ITP 2019 was jointly organized by the Telecom Regulatory Authority of India (TRAI) and the International Telecommunication Union (ITU). Over 100 participants attended the ITP 2019 from seventeen countries, representing various stakeholders such as policy makers, regulators, government agencies, broadcasters, distributors of DTH & cable industry, various Over-the-Top (OTT) players, academia etc.

This training programme was inaugurated by the Chairman, Telecom Disputes Settlement and Appellate Tribunal (TDSAT), Honorable Mr. Justice Shiva Kirti Singh, in a well-attended opening session. Delivering the inaugural address, he emphasized the importance & benefits of converged networks and emerging technologies in broadcasting sector. Dr. R.S. Sharma, Chairman TRAI while delivering his keynote address, presented an overview of the existing broadcasting sector in India, new trends & technologies and the challenges arising out of convergence. The inaugural function was graced by Mr. Amit Khare, Secretary, Ministry of Information & Broadcasting (MIB) besides Authority and senior officers of TRAI. Secretary, MIB gave his perspective on the main theme of the event. Mr. Sunil Kumar Gupta, Secretary, TRAI while delivering the welcome address spoke about the training programme and for joint initiative between ITU & TRAI in organizing such events. Mr. Sameer Sharma, Regional Director, ITU Regional Office for Asia and the Pacific Region, highlighted the role of ICT for achieving the UN Sustainable Development Goals and the need for embracing digital transformation with focus on cross sectoral collaboration with support by the government , facilitative regulatory regime and innovative business models and collaboration by the industry.

The training programme was carried out for three days dealing with technology related topics such as 'Business Models for OTT', 'Broadband over Cable TV network', 'Broadcast off-load technologies', 'AI, ML and Cyber Security' etc. The programme addressed several pertinent issues relating to present status, trends, new technologies

in broadcasting sector, ITU assistances in the Asia-Pacific region on digital broadcasting transition and also, how broadcasters and telcos could embrace OTT while carrying out their traditional broadcasting over the air and IPTV delivery on their networks respectively while deploying or offering Content Delivery Network (CDN) services and their business model. The program also covered the emerging trends and developments happening in the area of media consumption devices, how it is affecting the delivery and pattern of consumption of media and how to introduce the latest developments in the field of rating and measurements of viewership delivered through different means and platforms. The Programme highlighted the building blocks required to ensure that regulatory measures remains relevant and appropriate for the new environment.

**SESSION 1:**

**Introduction to the Training and Objectives**

This session introduced the background of the training, objectives and outcomes. Key topics that were covered during the training course were highlighted. Participants and speakers were informed as to how the training programme would address the key topics with emphasis on need to address existing as well as emerging challenges in digital broadcasting technologies as well as sharing country experiences and possible areas of collaboration.

This session also introduced the standardization initiatives of ITU and digital transformation as a key to accelerate progress towards Sustainable Development Goals (SDGs). It emphasized the need that digital transformation requires an ecosystem approach. Various Asia Pacific Regional initiatives on broadcasting being undertaken by ITU and also the ITU paper on “The challenge of Managing Digital content” and Paper on “Trends in Broadcasting: An overview of developments”, ITU Report on AI systems for programme production and exchange were discussed. ITU initiatives on helping various countries to carry forward National Roadmaps for transition from analogue to digital broadcasting, the technologies that are causing disruption and exploring the future of media and Issues of OTT, emerging trends and seek solutions for the same were also discussed.

Session also briefly discussed the past and future ITU workshops on the Future of Television and some relevant ITU-D publications on Digital Terrestrial Television Broadcast.

**SESSION 2:**

**Present Status, Trends, New Technologies in Broadcasting Sector**

**Session Moderator: Dr. R.S. Sharma, Chairman, TRAI**

The session moderator opened the session by deliberating upon that broadcasting industry is changing at a rapid pace. The underlying digitisation process which has already fundamentally reshaped industries like music and publishing for a variety of reasons now is increasingly reshaping the TV/Video vertical. These changes in the industry apply across the whole value chain from how content is created, to how content

is distributed and then delivered to end users and finally to how content is consumed by the end users themselves. These changes create significant threats to many incumbents in the industry who need to transform to support these new Digital and OTT models.

The session provided an overview of the existing broadcasting sector in India, Hungary and South Korea. The session also discussed the latest technologies being deployed and trends related to the broadcasting sector. Session reported on a summary of the ITU assistance in the Asia-Pacific Region on digital broadcasting transition. Session also presented some advance developments taking place in Asia-Pacific region as well as globally.

The floor discussed extensively on the challenges in implementing the emerging technologies and opportunities along with transformation of the broadcasting industry and the way forward. During the session, a snapshot of the different emerging technologies being utilized presently and the plans for the future deployment and DTTB standards adopted by the Asia South Pacific (ASP) countries was highlighted. Discussions were also held about the ITU initiatives on assistance to various countries for transition from analogue to digital broadcasting.

**SESSION 3:**

**Broadcasters' and Telcos' Perspective on OTT – IBB, IPTV vs. OTT**

**Session Moderator : Mr. H Pradeep Rao, Member, TRAI**

The session moderator emphasized about the rapidly changing technology, convergence and regulatory challenges in the broadcasting sector. It was mentioned that as the dividing line becomes more and more blurred it becomes extremely difficult for government to cope up with the pace of change that would be equally applicable to the service providers and players in the industry. Recent survey in the Asia-Pacific region has shown that subscribers' growth may remain flat in the future because of people watching content on OTT. Traditional business models of both telcos and broadcasters are going to get affected. To address the regulation of OTT this training programme has come at a right time.

The panel discussed extensively the views of public as well as private broadcasters. It was discussed that a regulatory framework is required for change from single platform to multiple devices, from broadcast to unicast, from one TV to multi TV homes. We need a regulatory framework that is flexible yet firm. During the session panelists mentioned that need of the hour is to focus on content generation and its security, augmented and virtual reality. Discussions also held about evolution of Linear Broadcast to Broadband TV and its effect on pricing of content and traditional broadcasters. Walled garden approach by OTT platforms, device manufacturers etc. to lure customers and the future questions about Value of integrating OTT and linear TV were discussed. Public Sector Broadcasters' perspective on the issue and the role of broadcasters' post convergence era were discussed.

The session provided how broadcasters and telcos could embrace OTT while carrying out their traditional broadcasting over air and IPTV delivery on their networks respectively or offering CDN services.

**SESSION 4:**

**Business Models for OTT**

**Session moderator: Mr. S.K. Gupta, Secretary, TRAI**

Session Moderator started the session by mentioning that OTT is not a new phenomenon and it is giving very good revenue of over US $ 76 billion for 2018 worldwide and being led by most of the US based companies and is picking up. OTT depends upon two components one is availability of the content and second is availability and affordability of reliable broadband. There are quite a few challenges. OTT model is primarily based on advertisement revenue model. Advertisement revenue is being redistributed amongst the various platforms which are available as of now and the challenge would be to see that how it can be made viable business model in the changing circumstances. Monetization of OTTs is a challenge, however there are various business models available including Subscription video on demand (SVOD), Transactional Video on Demand (TVOD), ad-based video on demand (AVOD) etc. Further, additional models can be utilized by integrating traditional broadcast and non-traditional broadcast. OTT has distinct features from traditional broadcasters. The business models are also distinct. Piracy is one of the biggest problems that we are facing as a regulator and the menace must be controlled to allow the growth of OTT.

The session discussed the sustainability issues in the content delivery in the form of OTT for traditional broadcasters and for non-traditional broadcasters. The session also examined how broadcasters can seamlessly combine over the air broadcast with broadband delivery. While discussing, recent developments in the challenges of monetizing content at a time of declining adverting revenue was addressed. Panel discussed about Curated Online Video, how video drives Internet growth and how pirated content is a big competition for legitimate OTT services. Government and Regulators all over the world have to facilitate the growth of legitimate platforms over pirated content by working on light touch regulations. Panel also discussed that OTT puts pressure on traditional linear broadcasters especially on public sector broadcasters because of technology and budget constraints.

Moderator while wrapping up the session summed up that (a) QoS is important for OTT; (b) Targeted market is important for OTT; (c) Stiff competition to traditional broadcasters from OTT players; (d) Different business models available for OTT and for integrated business models of broadcasters and OTT players.

**SESSION 5:**

**Broadband over Cable TV Network**

**Session moderator Mr. Amit Khare, Secretary, MIB**

The Session moderator mentioned that convergence of technologies has helped growth of new services which includes Broadband through cable service providers**.** Roughly

there are197 million households with TV connections; 120 million TV connections through cable; rest through DTH & other platforms. The Internet to these 120 million households can be provided through cable**.** It was mentioned that changes will be required at Cable operator end to provide the Internet; change from one way to two-way exchange of data. It was further mentioned that the cost of laying may be borne by the private operators and the cost can be recovered by the private operators through their varied business models.

The session deliberated upon the challenges that fibre does not reach urban and semi urban areas where there is prevalence of cable TV connections due to Right of Way and revenue share issues. It was discussed that there are challenges in switching of technology and the fact that spectrum is a limited resource, some of the services utilized on mobile spectrum can be shifted to broadband. It was mentioned that cable TV operators can leverage their existing infrastructure and existing subscriber base and provide broadband services. Traditional cable TV operators and telcos both are doing exceptionally well in fixed line broadband services and there is huge scope for growth and it was mentioned that to compete with OTT players, cable TV operators have to provide broadband services.

During the session it was also mentioned MIB and TRAI have played pivotal role in digitization and broadband over cable TV services. Laying of fibre is a difficult task and differs from terrain to terrain. Different technologies suit different jurisdictions and terrains. Rollout of cable has to be future ready and future proof for small cable operators.
It was also mentioned that there is a great opportunity for collaboration between telcos and cable operators. Partnership with cable operators can help in providing last mile connectivity.

Moderator while wrapping up the session emphasized that both regulators and industry stakeholders have the same goal. They both recognize the challenges and in collaborating to find a solution and devising a way forward.

**SESSION 6 :**

**Broadcast Off-Load Technologies**

**Session moderator: Mr. Shashi Shekhar Vempati CEO, Prasar Bharti, New Delhi**

Moderator started the session by mentioning about the technological advancement in the broadcasting sector by advent of OTT platforms, on-demand content consumption etc. The focus was on how broadcasting is used for pushing popular content to masses and how it provides services based on time and geography.

Session also covered that how a service provider in India (Reliance Jio) has deployed evolved Multimedia Broadcast Multicast Service (eMBMS) technology in their 4G network to receive on Jio devices which is very beneficial and which leaves with just projectization and commercialization for the service provider. Discussions were held that at present time content can be seen anytime online/offline and this benefits the end user as well as the content provider. It was also mentioned during the session that for a good technology a transmitting architecture is required. It was mentioned that the data rate in other countries

is higher in comparison to India. Discussions were also held that the 5G Unicast will not solve problems due to the insatiable need of data.

During the session cases were shown about how Malaysia is adopting the DTT technologies and that the analogue switch-off is on-going in Malaysia. It was further explained how 4 forums have been established by Malaysian Communications and Multimedia Commission (MCMC). The first forum is the Technical forum which develops and modifies technological codes for service providers and other stakeholders. The second forum is Access forum which is setup to develop access codes which will serve as guidelines for industries. The third is Content forum which establishes procedure for content providers and the fourth is Consumer forum which provides guidelines for consumer services. It was mentioned that self-regulation is the motive for forming above four forums.

The session provided practical aspects of implementation of DTTB from global deployments and challenges in its implementation. Session also addressed some successful implementation of DTTB from Asia-Pacific region and role(s) that various stakeholders are playing to make it happen. The session highlighted them by relating to practical implementations.

**SESSION 7:**

**CDN Networks for Media Delivery and Distribution**

**Session moderator: Mr. U.K. Srivastava, Pr. Advisor, TRAI**

The Session Moderator highlighted the importance of CDN in delivery of OTT services. Further, provided an overview of the evolution of CDNs and its practical use case of OTT.

The session covered the process of value chain followed in the past like content production, editorial function carried out by public broadcaster and distribution in the way of analogue terrestrial broadcasting and mentioned about the process of present value chain. Instead of Walled-Garden approach, the new open model should be adopted as mobility, flexibility is a basic requirement of the latest info-communication technologies (ICTs). By this model, the content can be accessed from any device, anywhere, anytime, as long as there is an appropriate Internet connection.

The session also covered the ways/methods by which OTT can be more successful. Discussions were also held that CDN architecture plays a vital role in delivering quality content via OTT services for unbeatable and seamless digital experience. The panel discussed that data centers globally rely on the Internet to deliver content to edge devices. Without a CDN, delivery of content suffers yielding poor customer experience.

Session also addressed the way forward that how telcos and broadcast industry are collaborating to offer broadcast-like services over the broadband, security aspects of cloud data etc.

**SESSION 8:**

**IBB and OTT Media Services in the Asia-Pacific**

**Session moderator: Sameer Sharma, ITU**

The Session moderator opened up discussions by deliberating upon the importance of OTT and the attention that the Regulators and Policy-makers world over are giving to it. He further deliberated upon the huge market for OTT applications and how app economy is impacting us and the need to take a holistic view of the app economy.

The session discussed the regulatory imbalances between traditional players and OTT operators, the licensing provisions, QoS parameters, emergency services, spectrum fee, GDPR issues etc. Discussions were held on Hybrid Broadcast-Broadband TV (HbbTV) how much it is adopted by countries, its comparison with Broadcast TV and how HbbTV enables seamless integration with linear TV and OTT. Various business models and insight in Asian specific market was discussed. Session also touched upon aspect of big screen, user defined features that are difficult to understand and use for migration from small to big screen. Session also discussed the markets for the smart TVs in the various countries.

The session introduced the technological and business developments taking place in the field of broadcasting through Terrestrial systems for mobile/portable devices (including DVB T-2, eMBMS , Curated online videos etc.). Session also addressed technical, business and regulatory challenges with least developments while examining the services they could offer. The session also discussed about the standardization of loudness and the prescribed standards of ITU for loudness.

There was question from the floor regarding the privacy issues which the session moderator noted for feedback.

**SESSION 9:**

**Emerging Trends in Devices for Content Distribution**

**Session Moderator: Mr. S.K. Mishra, Pr. Advisor (F&EA), TRAI**

The session moderator opened the session by discussing about the developments and emerging Trends in Devices for Content Distribution**.**

The session extensively deliberated upon the massive uptake per capita usage of data which is expected to rise many fold by the year 2022. It was mentioned that the consumption has been added on and not replaced which has led to huge latent demand for entertainment. Smartphone penetration coupled with lower than ever data prices is gradually turning streaming platforms to mainstream entertainment destinations. It was

also mentioned that because of new/bigger screens there has been increased-demand. The bigger screens in the devices are giving audience the better viewing experience at the time and place of their convenience.

During the session it was highlighted that content is still the King, so the ease of content discovery with enhanced user experience and personalization, will drive the uptake of specific platforms and Technologies like AR/VR, Voice and Vision intelligence, 8K, AI and 5G will completely change the TV viewing experience very soon!

The session also discussed the latest add on features on devices like blocking, child lock features and control of devices through voice.

The session introduced the developments happening in the area of media consumption devices (CPEs, Display terminals, Hybrid STBs, etc.) and how they affect the delivery and pattern of consumption of media, in the age of convergence. Presenters addressed how consumer industry, broadcast industry and service providers are functioning to provide services on any device at anytime, anywhere as a way forward.

**SESSION 10:**

**Emerging Trends in Rating and Weightage of Different Media**

**Session moderator: Mr. Partho Dasgupta, CEO, BARC India**

The session started by discussing about coverage of devices across population and to know what consumers are viewing across all platforms for the Rating and Weightage of Different Media. There is no single measurement technique that will work globally.

The session covered various ingredients of multi-screen measurement which depends on factors like coverage, metadata alignment, deduplication, comparable metrics and syndicated audiences. The session also discussed about the technological innovation in cross platform for rating and measurement. It was also mentioned that India is a market of un-paralleled diversity and hence needs unique approach to digital measurement.

The session also discussed the various challenges faced by advertisers i.e. media becoming fragmented, the cost getting increased, multiplicity of media consumption amongst consumers, varying reporting requirements and lack of accountability. It was further discussed about current status of Audience Research in India in TV, Print, Radio, etc. Discussions also took note of various technologies in audience measurement where it can measure across the devices and about inbuilt devices. Privacy is also an issue in audience measurement. The session also discussed about the single multimedia measurement and the innovation aspect, challenges and complexity of size.

The session highlighted the latest developments in the field of rating and measurements of viewership/media consumption delivered through different means and platforms. Those insights would be useful for all stakeholders in the broadcast and media industry. The latest developments in technologies have offered both challenges and opportunities in this area.

**SESSION 11:**

**AI, ML and Cyber Security**

**Session moderator: Mr. Sunil Bajpai, Pr. Advisor, TRAI**

The session highlighted the importance of artificial intelligence, machine learning and cyber security. It also discussed about the rapid advancements in ICT offering both challenges as well as opportunities for broadcasters. Cyber threats are becoming common in not only in other industries but also in media and broadcast. The session covered the mandate of ITU amongst the UN System to build the confidence and trust in use of ICT and shared the ITU assistances on establishment of Computer Incident Response Team ( CIRT), drafting National Cybersecurity Strategies, carrying our regional Cyber Drills and protecting children in cyberspace through ITU-UNICEF initiative “Child Online Protection”.

The session discussed about the potential threats that are increasing while servicing online and recommended actions to mitigate them, highlight the role of AI and ML play for better productivity and efficiency in broadcast operations. The session discussed that using open and standards-based IP network is certainly good business as it allows a direct, more personal – and ideally, more profitable relationship with those who purchase and consumer content but at the same time it opens up significant new risks that could lead companies’ content, data and business systems to be compromised. Those risks, if not mitigated, represent a true existential risk.

**SESSION 12:**

**Regulatory Policy, Practices & Challenges in the Era of Convergence (of Services) Policy and Regulations**

**Session moderator: Mr. S.K. Gupta, Secretary, TRAI**

The session moderator mentioned that the rise of the app economy and the ubiquity of smart mobile devices have dramatically shaped the television industry in digitally advanced countries in video consumption, content creation, and distribution and business models. Convergent video technologies have allowed viewers to watch audiovisual content on TVs, PCs, and mobile phones. This has created great opportunities for users and for companies that can leverage global scale solutions and systems.

This presents both opportunities and challenges for regulators. Governments and sector regulators need to find a balance between maximizing the benefits of the new ICT ecosystem and securing optimal policy and regulatory objectives designed to address potential and actually negative consequences of a changed landscape such as abuse of market power, abuses of consumer rights and lack of development of local content production. Such a balance needs to optimise sector-specific regulation while also creating an enabling environment that contributes to innovation and investment.

The session also deliberated on the Regulatory Policy, Practices & Challenges in the Era of Convergence (of Services) Policy and Regulations being followed in Hungary, Malaysia

The session discussed and provided policy and regulatory mechanisms those are in place both in Asia-Pacific region and beyond to address the opportunities and challenges pose by recent technological and other advancements in the communication industry.