BIF
BROADBAND INDIA FORUM
"Think Tank for Digital Transformation"

BROADBAND Bits & Bytes

A BIF Communiqué

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Contents

Dr. Rishi Mohan Bhatnagar
President, Aeris Communications
Chairman, IET IoT Panel India

Foreword

Technology and Innovation AI and Robotics

Robot-led automation has the potential to change today's workplace as dramatically as the machines of the Industrial Revolution changed the Factory Floor.

It is estimated that by 2020, as many as 3 million industrial robots will be operational. The global service robotics market is estimated to almost triple by 2022 from the 2016 level.

The artificial intelligence (AI) robots market was valued at USD 2.84 Billion in 2017 and is expected to reach USD 12.36 Billion by 2023, at a CAGR of 28.78% during the forecast period.

Robotics and Artificial Intelligence will support almost all spheres and industries, including Manufacturing, Logistics & Supply chain, Healthcare, Defence & Security, Policing, BFSI, to name a few.

Global Robotics Technology market (2013-2020)

The value chain of robotics technology market includes stakeholders like robot designers and suppliers of standard hardware components, suppliers of special engineered components, software providers, system integrators, and end users. Each of these players share a specific value at their point of operation, which in turn contributes to the competitive value of the product. The R&D activities, innovations, and marketing strategies enhance the value associated with the end-deliverable by each player.

The future of robotics in India

The rapid transformation and advancement in the robotics sector in India come as a refreshing development in the technological landscape. The combination of AI, Machine Learning and IoT, robotics will undeniably take on scores of jobs currently being tackled by humans. It will lead to creation of as many, if not more new professions and jobs in return. The advancement in robotics is great news for humans as robots will take care of their repetitive, cumbersome and physically draining tasks. Human workers can, therefore, focus on more creative, skill-based roles that will contribute to their pool of knowledge and fast-track their career growth.

AI in India

During the 2018 Budget presentation, Finance Minister Arun Jaitley informed that Niti Aayog will initiate national programmes on artificial intelligence (AI). China has already been heavily investing in AI in the past few years. According to Andrew Ng, Professor at Stanford University, AI is the next electricity; it will be the main force behind development like how electricity played a major role in world development during the early 20th century.

Countries such as India can benefit a lot from the use of AI by focusing on sectors such as healthcare, agriculture, manufacturing, infrastructure etc. Another area we need to focus upon is the use of AI in defence. Issues such as tax evasion, money laundering etc. can be easily addressed using AI. The government will play an important role in encouraging AI research among Indian scientific community. We will have to reskill the current workforce since many skills will become irrelevant in the future. There is a great opportunity for India to excel in AI domain like in the case of IT. China is investing $2.1 billion in creating an AI research park.

Bringing all stakeholders together will be the key to success

> "THE RAPID TRANSFORMATION AND ADVANCEMENT IN THE ROBOTICS SECTOR IN INDIA COME AS A REFRESHING DEVELOPMENT IN THE TECHNOLOGICAL LANDSCAPE."

TV Ramachandran
President
Broadband India Forum

From the President's Desk

Dear Readers,

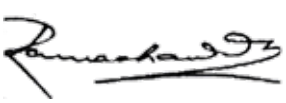
Welcome to the First Edition of our Quarterly Newsletter for FY 2019 Broadband Bits & Bytes on trends and perspectives related to Broadband sector in India. The BIF Newsletter focusses in its diffrent editions on key areas such as 5G, spectrum and licensing, content and applications, SatCom, infrastructure, security, new technologies and innovations, IoT & AI which could lead to proliferation of Broadband in India.

BIF is dedicated to enhance the potential of the entire ecosystem to deliver broadband across the whole of India. BIF's mission is to support and enhance all policy, regulatory & standards initiatives for the proliferation of high quality broadband in the country in a technology-neutral and all-inclusive manner. We have, in a very short time-frame, contributed to several regulatory and policy consultations and been working closely with all concerned Government agencies providing credible inputs on Broadband to assist and facilitate the process of policy making.

The Newsletter is divided into several sections. In this edition, in the "Spotlight" section, we present an article on "Blockchain is the best vehicle for IoT". In the "Industry Speak" section, we have views on "How will IoT & AI change the life style and productivity in the country with examples from any specific use case" and I would like to thank the industry experts personally for sharing their valuable thoughts. In our "Newsflash" section, we have summarized the significant happenings in the Broadband sector over the last quarter and the "Events" section gives a glimpse of the past and proposed BIF Events.

In an effort to make this newsletter more useful to you, we would appreciate your comments and suggestions that you may have on this issue as well as topics that you would like us to feature in the forthcoming issues.

Happy reading!



"NDCP 2018 IS ALSO AN ESSENTIAL CATALYST IN PRIORITISING THE RIGHT BREEDING GROUNDS TO RECEIVE IOT TECHNOLOGY"

SPOTLIGHT:

Blockchain is the best vehicle for IoT

Security is expected to be a significant concern as IoT networks get larger. Blockchain technology works best here

By TV Ramachandran
Published in the Hindu Business Line, May 2019

IoT or Internet of Things is a much touted technology these days. All-pervasive, spanning multiple verticals, a humongous amount of data is being captured from all around us by millions of devices. This may sound impressive, but the moot question, as Debjani Ghosh of Nasscom rightly poses, is: "Are we able to derive optimum economic value from the mountainous heap of data" generated?

The answer is not totally encouraging since success here depends on the quality and adequacy of the back-office systems and technologies. That, globally, only about 30 per cent of IoT projects survive beyond the pilot phase is a powerful indicator that much needs to be done to effectively tap this new technology.

In this context enters blockchain or multi-ledger technology to provide possible deliverance. Designed specifically as a back-end for Bitcoin, the conceptual architecture of blockchain has evolved and found theoretical application in nearly every industry. It takes no more than querying any search engine with a combination of the blockchain and an industry or vertical of your choosing, to discover a large body of literature detailing how the blockchain is expected to solve prevailing inefficiencies.

While some uses may currently seem far-fetched or out of reach, there are others that are close at hand. One thing is clear: blockchain, as a conceptual framework, is wonderfully versatile.

Of the many possible uses of the blockchain, IoT is amongst those that stand to benefit significantly, yet the combination rarely gets the attention it deserves. According to the annual Cisco Visual Networking Report, the number of connected devices in the world will "grow 2.4-fold, from 6.1 billion in 2017 to 14.6 billion by 2022".

Traffic from these connected devices is expected to grow seven-fold over the same period. We won't just see an exponential increase in the number of devices, but also in the amount of data transmitted and computation required. There are reasonable concerns with respect to scalability, reliability and security when considering the creation of large IoT networks, and the blockchain may just be the alchemical ingredient the industry needs.

Given predictions and eventualities, specifically with reference to the sheer growth that is expected in the number of networked "things", it becomes imperative to provide for an acceptable level of confidence in the platforms that will power the Internet of Things. The blockchains' ability to work as a distributed network, and safely execute on a wide variety of requirements make it an ideal candidate to support the level of innovation and adoption required for IoT to succeed.

The key issues of scalability, identity management, autonomy, reliability, security and marketing can all be addressed by a well architected blockchain.

Core features

The current centralised architectures of IoT networks pose a problem when we consider the scale of citywide networks that would track hundreds of metrics from millions of things. The expected points of failure and scalability bottlenecks can be adequately addressed by a blockchain. Decentralisation is a core feature of blockchains, and if implemented appropriately could allow for a shift to peer to peer network designs, greater fault tolerance and expedited scalability.

A massive IoT network would also be required to manage identities – of both users and things – efficiently and securely. An intuitive benefit of a common blockchain would certainly be the efficiency with which this identity management would take place. After all, if all identity records are contained within a single network, their discovery and management will be far simpler than if multiple networks had to be connected just for these devices to be able to talk to each other.

The very nature of IoT mandates a certain level of autonomy in the functioning of enabling platforms. The reliance on server farms is expected to be significant for any large scale IoT implementation. Once again, the blockchain offers a possible solution. With a blockchain, devices would be able to communicate without the need for large server farms and could be deployed in a device-agnostic manner at scale.

The tamper-proof nature of the blockchain is yet another quality that draws companies and entire industries towards it. This essential security feature finds perfect application within IoT, where authenticity and verification of data are critical, especially in the case of digitised citywide networks.

Security is expected to be a significant area of concern as IoT networks get larger and more ambitious. The information flowing over IoT networks can be secured effectively by storing it as a transaction on a blockchain. Powered by smart contracts, the blockchain could enable secure communications between devices, with scope for radical innovation.

While all these represent efficiency improvements that would allow for greater innovation, large scale adoption is another matter that accompanies distinct requirements.

Market access

Remarkably, the blockchain possesses the ability to increase market access for deployed services. Transactions between peers can be simplified to a significant degree, and without the need for authorities or third parties. The blockchains' trustless environment, which ironically offers unprecedented levels of distributed security, is ideal for the deployment of micro services and for the simplified execution of micro transactions.

Comparisons between blockchain and the internet are unfounded. The versatility of the blockchain is established by the fact that it integrates well in a wide variety of applications, and can drive efficiency across a range of parameters. What then is the most appropriate course of action to begin integrating the blockchain with the IoT and, possibly, with Artificial Intelligence too? Perhaps an answer can be found in an examination of what the technology has enabled in other sectors, and try to integrate what has worked, while avoiding what didn't. The R3 model is one that offers up some unique insights. The consortium today is made up of nearly 200 members and has in four years been able to implement a blockchain based financial solution. Yet, membership in this consortium is not limited to financial institutions, but rather best served, as it currently is, by mix of banks, IT companies and others.

The IoT sector has a mix of stakeholders, each with a vested interest in the success of the paradigm. Wouldn't, then, cooperation between these stakeholders be the key ingredient that brings to fruition the development of an open source IoT blockchain that is capable of accelerating innovation in and adoption of IoT networks and service?

The writer is President of Broadband India Forum. Views are personal. Research inputs from Kartik Berry.

Industry Speak: How will IoT & AI change the life style and productivity in the country with examples from any specific use case?

Vipin Tyagi
Executive Director
C-DOT

AI and IoT are both upcoming, focused and independent research areas. But, together they are bound to create more value for customers and businesses in the near future. As these technologies are applicable to almost all sectors and require digital connectivity, the digital communications is fast becoming a backbone of economy surpassing traditional voice communication.

The large social providers of modern days require next level of technological intervention. It is well understood that AI will have a big role to play in backend processing of the huge data generated by IoT. However, with the greater processing powers and more battery life of sensors, AI will also provide 'edge' intelligence in IoT devices. For instance, with more intelligence in cameras, police will be able to respond quickly to events such as crowding, fighting and accidents. Sensors evaluating the contents of industrial wastes would identify the worst polluters and automatically cut them off from throwing their waste into rivers. Gates would close automatically to disallow entry to polluting cars into designated areas/ localities and an e-challan would be automatically generated for the car owners. There are many such everyday problems that we can fix with AI and IoT combined.

So, by all means, AI and IoT combined have a great future ahead.

Ashwani Rana
Public Policy Director
Facebook

We believe that Artificial Intelligence (AI) has vast potential to create new industries and grow the global economy. Facebook is working openly with, and investing in, the AI research community as we strive to make meaningful progress in computer vision, natural language processing, and the kinds of physical and logical infrastructure required to run these highly advanced AI systems. We remain committed to an open source model which we believe ultimately spurs more innovation, encourages collaboration and mutual review, and helps us all move faster. As the technology develops, there should be an ongoing dialogue between academia, industry, and civil society to ensure the use of AI remains responsible.

IoT & AI hold the potential to overcome the deficits India has been facing in the fields of agriculture, healthcare, transportation, garbage disposal etc. With IoT, we can make healthcare more accessible, control rising pollution levels, connect ambulances to hospital information system, monitor a patient's vitals & raise timely alarms. Recently, TCIL was able to implement the 'Early Warning Dissemination System' in Odisha during cyclone Fani. A record number of 1.2 million people were evacuated to safety before the cyclone made landfall. We are supporting start-ups that are experimenting with AI and IOT to reduce pain points in everyday life, transportation and fitness.

As the world turns towards greater connectivity and technological advancements, IoT & AI are here to stay.

A Seshagiri Rao
Chairman & Managing Director
Telecommunications Consultants India Limited (TCIL)

AI & IoT will have a substantial impact across various sectors of the economy.

Health sector will be transformed with smart wearables and home diagnostics, agriculture productivity will be significantly enhanced through greater control of inputs and remote monitoring. Manufacturing productivity will be enhanced through greater automation using robotics.

Adoption of IoT and AI is particularly critical to create sustainable urban infrastructure with the use of smart security, smart traffic management, connected cars and other smart city technologies.

Environmental sustainability will also benefit from smart water management, efficient energy management and bio-diversity tracking.

Chandrasekar Ramamoorthy
Co-Founder and Chief Product Officer
Phimetrics Technologies Pvt. Limited

IoT and AI will enable us to deliver public services to all citizens, since broadband will make every remote service connected via IoT and AI will enable us to automate the service delivery and response. Public safety services will be the area where maximum impact will happen, as large scale video data analysis can be performed for the first time, because IoT cameras are moving data to the edge or cloud, and AI engines are analysing the video frames for actionable intelligence in real time.

Shyamal Kumar
CEO, Lavelle Networks

Newsflash: BIF Updates

CURRENT BIF SUBMISSIONS ON IMPORTANT TOPICS:

- Response to the TRAI Consultation Paper on 'Allotment of Spectrum to Indian Railways for Public Safety & Security Services.'
- Response to the National Broadcast Policy.
- Submitted a letter along with a representation on Spectrum Auctions and Liberalised Wi-Fi to Digital Communication Commission (DCC) members and also to TRAI.
- Provided inputs to FICCI on the DoT sought response on the "Measures to accelerate investment and growth of Telecom Sector in India"

BIF'S PARTICIPATION AT IMPORTANT MEETINGS:

- BIF took part in DoT's NTIPRIT in-service course on 'Smart Cities' conducted in Ghaziabad where Mr. Debashish Bhattacharya, Sr. Director-Technology & Policy and Mr. Krishna Sirohi, Sr. Technology Advisor, made presentations on "IoT enabling Smart Verticals - Use cases and Technologies: & "5G for IoT- 3 GPP technologies for the future and related use cases" respectively. The presentations were very well received by the audience.
- BIF took part in the TRAI OHD on OSPs and articulated its stated position. This was held on 15th July 2019

PUBLICATIONS IN THE PIPELINE:

- White Paper on Data Center with Koan Advisory
- Impact on Job Creation potential in Rural India with the adoption of IOT & AI with special focus on Agriculture and Healthcare with Feedback Consulting
- White paper on Fibre Grid
- India Satcom Paper with ICRIER
- Report on Rural Digital Initiatives with ICRIER
- 5G Procurement & Market Access inputs provided to DOT

BIF'S HI-LEVEL COMMITTEES:

- Hi-Level Committees restructured to bring maximum value to its Members.
  - ❖ **Two new Committees have been formed:**
    - ☛ Telecom, Media & Technology (TMT) Committee formed to discuss broadcast aspects to advance the interests of this growing sector which is a big pull for broadband.
    - ☛ Device Smart Phone Manufacturing Committee formed recognising that the Smart Phone is the ultimate broadband device.
  - ❖ Working Group on GPR is working with DoT for Implementation Strategy for NDCP-2018. The first interaction was held on 9th July on Connect India - Creating Robust Communications Infrastructure and Propel India Presentation on Promoting Next Generation Technologies in India - AI/IOT application in Health and Agriculture Sector and creation of new jobs in rural areas. The next aspect of NDCP will be on Satcom and the other aspects of NDCP will be dealt in subsequent interaction with DOT
- Committee meetings – (June-August,2019)
  - ❖ A meeting of the BIF Broadband Infrastructure Committee was held on 4th June 2019 & 1st July 2019 to discuss about the NDCP BIF DoT interaction on Connect & Propel India.
  - ❖ The Satcom Committee Members interacted over a phone call on 26th July, 2019 to discuss the preparations for the 5th International India Satcom 2019 Conference in N Delhi; second interaction with DoT on the implementation of Satcom related points in NDCP, 2018; planning & preparation of DOS – Industry stakeholders meeting towards end August/ September, 2019 in Bangalore & finalisation of the White Paper on the Potential of the Satcom Industry with ICRIER and planning for its formal release in August/September 2019.

BIF Events (June – August 2019)

BIF-DoT interaction on the NDCP implementation of strategies on Connect India: National Broadband Mission & Propel India: Enabling Next Generation Technologies on Tuesday, 9th July, 2019 at the Constitution Club of India. This was the first interaction with DoT on the NDCP implementation plan. BIF will conduct a series of such interactions to support the implementation plan of DoT.

The session on Connect India was chaired by Shri Amit Yadav, Joint Secretary, Department of Telecommunications. The session on Propel India – Enabling Next Generation Technologies & Services was chaired by Shri Anil Kumar Sanghi, Advisor & Head, TEC (Special Guest of Honor) and Shri Vipin Tyagi, Executive Director, C – DoT.

BIF conducted a **Conference on IoT & AI** on Wednesday, 3rd July, 2019 on to discuss the positive impact on job creation in rural India with the adoption of IoT & AI with special focus on Agriculture and Healthcare Sector at Hotel Taj Mahal, New Delhi.

Mr. Yaduvendra Mathur IAS, Special Secretary, NITI Aayog was the Chief Guest.

BIF celebrated **World Wi-Fi Day** on Thursday, 20th June, 2019 with the support of WiFi Global Alliance. Shri Sanjay Shamrao Dhotre, Hon'ble MoS for Communications, IT & HRD was the Chief Guest. The event brought out some of the business cases and investment opportunities to the local entrepreneurs from Public Wi-Fi.

BIF conducted a one-day workshop on **'Future Spectrum Roadmap for Satellite Broadband Services in India'** which focused on the WRC-19 agenda on Tuesday, 11th June, 2019 at the Taj Mahal Hotel, New Delhi.

Ms Aruna Sundararajan, Secretary (T) & Chairperson, DCC, Ministry of Communications, presided over the workshop as the Chief Guest.

BIF as a knowledge partner:

BIF was a knowledge partner at the 3rd International Conference on 5G India 2019 hosted by Bharat Exhibitions on 26th & 27th June 2019 at Hotel Leela, Mumbai. Shri Anshu Prakash, Additional Secretary (Telecom) was the Chief Guest.

Upcoming event

BIF's Annual flagship event: 5th International Conference on India Satcom – 2019 on the theme "Satellite Applications for Inclusive Growth".

For information, please visit the BIF website: www.broadbandindiaforum.com.
Please contant Mr. Anil Prakash, Director General, BIF for speaking and sponsorship opportunities.

BIF Eminent Members

Patron Members

Corporate Members

Startup & Professional Members

Academia/Research Institutions

About Broadband India Forum

Mr. Anil Prakash
Director General
Broadband India Forum

Broadband India Forum (BIF) functions as a policy forum and think-tank that works for the development & enhancement of the entire broadband ecosystem in a holistic technology-neutral and service-neutral manner. BIF seeks to be a thought leader and a credible and effective voice to help propel the nation to achieve the country's ambitious vision of creating a Digital India. To achieve this, BIF works to promote the rapid development of policies to promote affordable and high speed ubiquitous broadband throughout the country.

Registered as IPTV Society, its brand - BIF was formed in October 2015 and is a fairly nascent but dedicated Forum with participation from all stake holders, including Technology Providers, Telecom Operators, Internet Service Providers, Value-Added Service Providers, Satellite Operators and service providers, MSO, Broadcasters, startups and professional entities as well as seasoned Industry professionals who are familiar with different technologies, operations, regulations and policies.

The Forum's senior leadership team includes renowned and respected professionals from background of Industry, Regulator and Government.

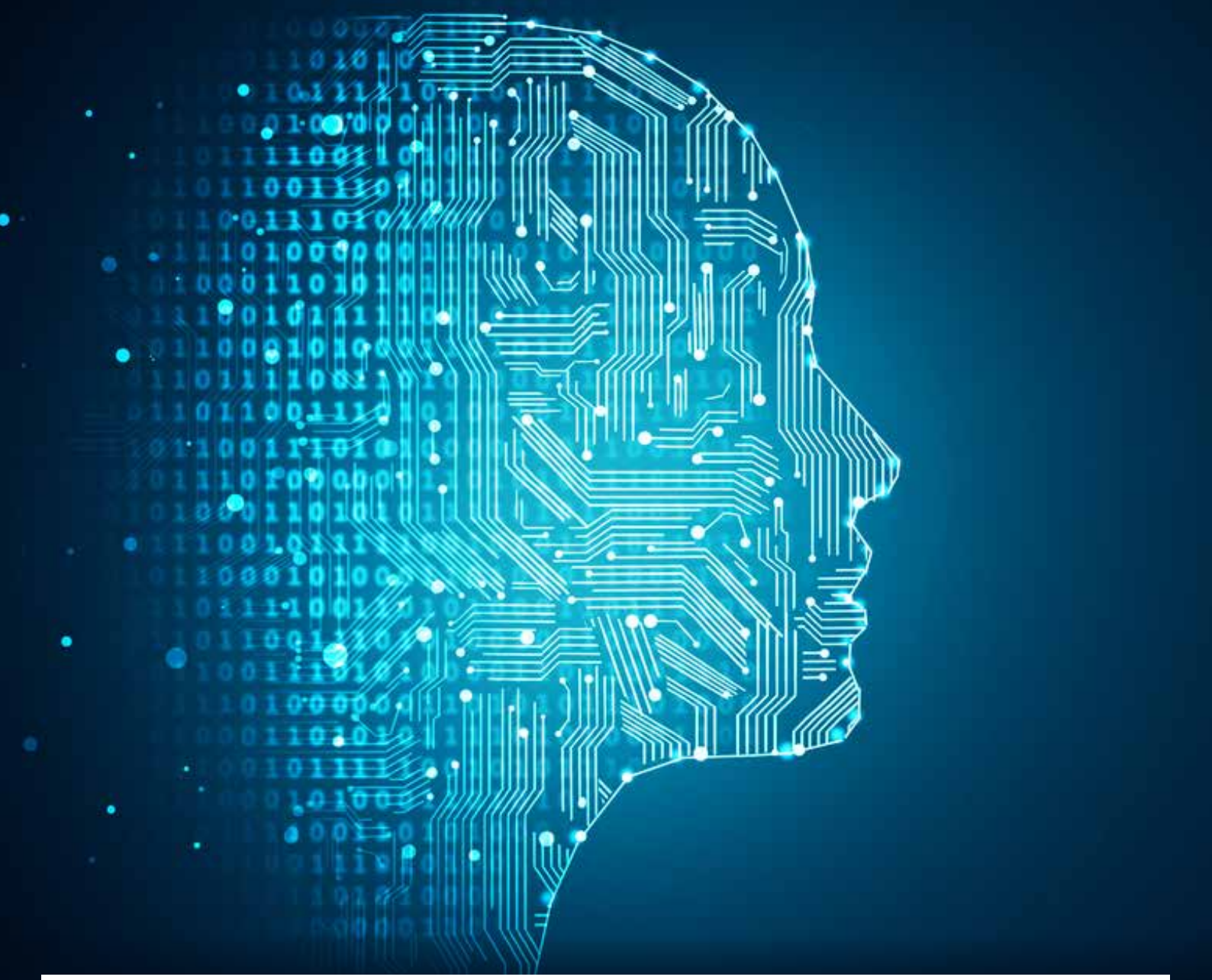
1. Mr. Shyamal Ghosh, Chairman Emeritus, BIF (Former Secretary, Telecom and Co-Founder of IPTV Society).
2. Mr. MF. Farooqui IAS (Retd.), Chairman, BIF (Former Secretary, Telecom).
3. Mr. T. V. Ramachandran, President, BIF (Hon. Fellow of the IET (London), former Resident Director-Regulatory Affairs and Government Relations, Vodafone, and first Director General of COAI).
4. Mr. Parag Kar, Sr. VP Govt. Affairs, India and South Asia-Qualcomm and Mr. Ashwani Rana, Head Connectivity Policy-Facebook are current Vice Presidents.
5. Mr. Anil Prakash is the Director General.
6. Mr. S. N. Gupta, seasoned technocrat and senior luminary who has worked in DoT and as a Principal Adviser to TRAI (Regulator) is the Treasurer.

BIF functions through many specialist committees for the advocacy, coordination, facilitation and promotion of all activities with the objective of furthering the goals of the National Telecom Policy in Spectrum, Licensing and Standardisation, Broadband Infrastructure, Manufacturing Rural Digital Initiatives, Content & Applications, SatCom & Broadcasting, 5G, New Technology & Innovations, IoT and ICT for Inclusive Ability.

The activities of the Forum broadly relate to coordination, promotion and formulation of expert opinion on topical subjects related to Broadband. To act as a bridge between Industry on one side and Government and the Regulatory Bodies on the other, front ending several issues related to policy & regulation.

"In this Edition of the Newsletter, Broadband – Bits and Bytes, we have made efforts to highlight the impact of IOT & AI on the global economy. Our endeavor is to keep you updated with latest technology, standards, innovation, policy and regulation, which embark on and facilitate speedy and affordable broadband proliferation in the country."

- Anil Prakash



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