

Workshop on “Neutral Digital Connectivity Infrastructure (DCI) in Buildings Dated 6th March, 2024, New Delhi

Meeting Notes

Curtain Raiser session: Quality of Experience of DCI in buildings – Consumer Perspective

After a round of welcome to all the delegates, speakers and participants, the MC informed the house that the event is supported by Ministry of Housing and Urban Affairs, Department of Telecommunications, TRAI, and Bureau of Indian Standards. Eminent speakers from various streams including Ministries, regulators, academia, industry, and property developers had got together to address the workshop during the course of the day.

The first panel discussion was on Quality of Experience of DCI in buildings – Consumer Perspective and the panelists for this session were Shri Tejpal Singh, Advisor (QA) - TRAI, Shri Mohit Lohani, Country Head- Mozark, and Shri. Vishal Bahri, COO- RANext, Shri. Kousik Gupta, CTO-CREST Digital, and Shri Rahul Tyagi, Managing Director, RTA Pvt. Ltd, with Dr. PSN Rao, Dean- SPA as the Moderator.

Shri Tejpal Singh delivered the keynote address in which he mentioned that the need for better indoor connectivity has been felt by all across the world and it is a well-known fact that 70% of data consumption happens indoors. **Quality of Experience (QoE)** is largely dependent on the QoS inside the buildings. The gap between QoE of customer and perception of service provider is due to poor connectivity inside most of the buildings.

In developed countries, **high Broadband penetration reduces the problem of QoE**. Further, buildings require deployment of sensors and other IoT devices and thus require robust indoor connectivity. Again, high quality of insulations and glass panels used in the buildings makes it difficult for RF signals to penetrate buildings adequately and hence there is poor mobile signal strength inside the buildings. Thus, **Telecom companies in EU offload traffic to Wi-Fi for better customer experience**. Improving connectivity by retrofitting wirings in the buildings leads to loss of aesthetics and often causes poor maintenance of services and hence requirement of DCI is increasing in Greenfield Buildings.

According to him, **5% increase in rentals in buildings with Digital Connectivity Infrastructure has been reported** (reported figures are 10-15% enhancement in rentals source:<https://wiredscore.com/blog/2022/10/12/wiredscore-launches-in-middle-east/>).

Architects do make provision for utilities like electricity, water, firefighting etc. but they do not make any provision for DCI as digital connectivity is considered as sole responsibility of Telcos. He stressed for DCI to be made an integral part of buildings and enabling standards be created.

He also mentioned that evaluation of rating framework is being done by TRAI and methodology and rating parameters shall come up in due course. Globally, “Wired Score” is doing rating of buildings for DCI in few countries.

Initiative by TRAI for rating of buildings is first of its kind across the world and TRAI supports reliable and trustworthy DCI in buildings. He also mentioned that TRAI solicits support on this initiative.

In the presentation, he mentioned that for DCI implementation collaboration of all stakeholders namely government, DCI rating agencies, property managers, service providers, consumers, and DCIP/IPs is needed.

Further, he mentioned five criteria for ratings. 1. Compliance to MBBL 2. Innovation in civil and electrical infrastructure for DCI 3. Future readiness 4. Provision of wired Connectivity 5. Wireless connectivity experience

Process of rating shall start with registration and then there will be first level due diligence. Once it is over then there will be stage 2 due diligences for award of ratings. The rating can/shall be renewed after expiry of the rating period, which can be one/two years.

This keynote address was followed by the panel discussion chaired by Dr PSN Rao. Dr. Rao at the outset stressed the **need for connectivity at all the time and at all the places**, for example hospitals, hotels, schools, university, scientific research buildings or commercial buildings. High degree of sophistication is required in providing connectivity. Relationship between digital connectivity and GDP is positive. Everyone has mobile and ability to carry out sophisticated activities is becoming dependent upon connectivity. Connectivity is also required for monitoring of the buildings.

In all the old buildings, large wires are often seen hanging and walls are punctured for the same, thereby making for poor aesthetics. Most buildings are retrofitted for connectivity. **Going forward people will be using both green and digital ratings while seeking apartment on rentals.** It is good that India has NBC with DCI and new National Building Code is expected in 2025.

Mr Vishal Bahri in response to the question on importance of reliability of connectivity stated that good quality connectivity is mandatory for both residential and commercial buildings because of adoption of 8K-16 K resolution content and change in life style. **For building a good quality infrastructure for connectivity, there is a need for all the service providers to start working on it with focus on QoE of customer.** Further, developers are taking interests in digital infrastructure inside the buildings but as of now it is being adopted by individual developers as per their wish. However, others will also start adopting the DCI, once mandated by byelaws. The concept is evolving and it is going to get traction among the customers also.

Mr Rahul Tyagi was of the opinion that **frustration to customers is generally due to poor or unstable cellular signals, network overloading, and inadequate connectivity infra in the building.** Need of internet for IoT devices is also increasing. Poor quality of customer experience tends to lead to customer frustrations. Individual's Productivity is directly proportional to the quality of connectivity Today builders are floating tenders for making building FTTX ready as no service provider is coming forward for such kind of work..

On the issue of rating of buildings, Mr Mohit Lohani was of the opinion that rating system evolves over a period of time and both qualitative and quantitative dimensions need to be understood by the stakeholders. TRAI through its consultation paper is looking for **rating dimensions, which are measurable, bring trust in the rating, and a framework easy to adopt so that people believe in the rating.** In his opinion, rating shall jack up property prices and customers shall be paying premium for the same. **Transparent Ratings will bring democratization in the prices of the buildings.** Innovations shall also come once ratings are started for the buildings.

Mr Kousik Gupta was also of the opinion that without rating, it is difficult for customers to understand quality of connectivity before buying or renting the dwelling unit. A customer must understand if building is connected with Wi-Fi or cellular and likely quality of service that he or she is going to experience. Thus, informed decision is important and **a portal must be created with display of building ratings. A paradigm shift is required for reliable digital connectivity infrastructure.**

According to Mr. Tejpal Singh the incentive of having ratings for builders would be in terms of 5% incremental in rentals on upside. Further, there is need to have transparent rating mechanism. Certain category of buildings must be mandated for ratings, to begin with.

Inaugural Session

The event was honoured by Dr. R S Sharma (former Chairman TRAI) as Chief Guest of the workshop, Smt. Aruna Sundararajan, Chairperson BIF, Shri Mahendra Srivastava, Principal Advisor, TRAI, Smt. Isha Kalia, Director AMRUT & Joint Secretary MoHUA, Shri V Suresh, President Good India Governance Foundation and Shri T V Ramachandran President BIF.

Brig Anil Tandan, DG BIF welcomed all the dignitaries, the delegates from industry, government and the real estate. He brought out that Covid 19 had impacted the society in big way and the need for good connectivity in indoors, gained a lot of importance; 70-80% of the data consumption is inside the buildings and it is no longer a choice. TRAI took cognizance of this and came out with Recommendations on Rating of Buildings & Areas for DCI. They are in the process of coming out with a framework on rating of buildings through a follow up consultation. It is important for all service providers to get unfettered access to the buildings for customers to have more choices. This can be best met by having neutral DCI as it not only enhances quality of network but also helps in maintaining aesthetics of the buildings.

He also intimated that BIF has been working closely with MoHUA, DoT, TRAI, and BIS on DCI and BIF has submitted a resolution on standard rating of buildings globally to ITU through TEC, DoT. This workshop has been conducted to create awareness among stakeholders on this subject.

Mr V Suresh was next to address the house. At the outset, he lauded the presentation given by Mr Tejpal Singh during the curtain raiser and deliberations in the previous panel discussion. He complimented Smt D Thara, Addl. Secretary MoHUA for amendments in NBC and to BIF for this initiative. New NBC -2025 is planned for release in 2025 and work on the same is going on through a panel of which BIF is also part. A separate chapter in part 6 of Section 8 shall be added in NBC 2025 version. He emphasized that, as per World Bank, with every 10% increase in broadband penetration leads to nearly 1.40% increase in GDP growth rate. ICRIER study states that every 10% increase in internet traffic delivers 3.1% increase in GDP per capita and a 10% increase in investment in Telecom will increase GDP by 3.3%. Connectivity has become very crucial for decision-making. The NDCP-18 had envisaged enhanced connectivity infrastructure in commercial, residential, hospitals, hostels etc.

According to him, implementation of rating framework would have to be as silver, gold and platinum, as in the case of green energy. Consumer demand for DCI is increasing and supply must match it. He highlighted that Oragadam in Tamil Nadu and Panvel in Maharashtra are two integrated and self-sustained projects, which have included DCI from design stage itself. There is need to introduce the word 'Build Environment' in NBC for example the use of Green Building environment rather than green buildings. In Dholera and GIFT city, good work is being done with respect to DCI. He complimented TRAI for working on rating of buildings and expected TRAI will come out with its recommendation soon. He mentioned that 25% of productivity enhancement is expected due to good quality DCI in buildings. He urged the need for joint promotional activities to be conducted by organizing workshops and seminars and by involving municipal commissioners.

Smt Isha Kalia stressed for DCI in building in current era of Digital India and Digital age. She shared her experience as collector in Punjab when call center was flooded with requests for restoring internet in troubled area. She pointed out that all sectors and economy is impacted by digital connectivity because Covid 19 has changed the way society works. Meetings have started happening online. Thus, enabling policies are required to be framed. From the design stage itself there is need to plan for DCI apart from utilities like electricity and water. MoHUA wants workshops like this to be conducted in all the states. Addendum to MBBL is the starting point and the skilling and training must happen to create a pool of DCI professional. She also echoed the view that builders, local authorities, and other stakeholders must come together for implementing DCI in buildings. It is ironical that all stakeholders realize importance of DCI but are reluctant to adopt for DCI infrastructure inside the buildings. She suggested BIF for taking such workshops to states to create awareness of DCI among various stakeholders. Rs 15000 Cr worth schemes are in progress wherein states are implementing agencies such as developing riverfronts, pan city IT projects. Such schemes can also be used for incentivizing states for promoting implementation of DCI in their respective states. She further requested BIF to share final actionable points of this event with MoHUA to take up the points with the panel for incorporation in NBC codes 2025 to be released in next FY.

Shri Mahendra Srivastava said that the situation started changing from 2010 when concept of connectivity was "anywhere to anywhere, anytime" to "Anything to anything, any time".

Communications have changed from circuit switched to IP. Today QoS is a parameter important and in this regards ITU has defined two terms Universal and meaningful. Universal connectivity means connectivity in all school, businesses or residences etc. Universal connectivity is not much of challenge now. Meaningful connectivity is important as having sufficient quality to utilize connectivity meaningfully. He raised the question of who is responsible or accountable for patchy In-building connectivity -builder or service provider or user. Whether current framework provide users meaningful connectivity? Framework is already there and TRAI has recommended the same and that is the reason NBC code has amended MBBL. But key question remains as to who will do it? Provision of duct is there in buildings but who will lay fiber in the duct? Today there is monopolistic attitude of infra providers. So who will upgrade infrastructure? TRAI has done extensive studies and its detailed recommendations shall come soon. Further, TRAI has used term Area not just the building. Thus, DCI can be intrinsic part of any smart city or gated community or building.

There is need to have a framework to co-design and Co-creation of infrastructure. There must be a right building plan. Further, need to empower developing authorities to see if the plan is as per standards or not. Every building must have a basic design so that minimum connectivity is ensured in the building. All stakeholders, property developers, users, DCI evaluators, development authorities, service providers, infra providers must come together. There is also need to have digital platform to share information required by users. Similar to electrical and civil engineers there must be DCI designers and engineers. To expedite DCI implementation it is necessary to empower the urban local bodies. He was of the opinion that the government buildings mandatorily have DCI in the buildings. He also informed that TRAI is in the advance stages of brining rating framework and it is conducting awareness programme with state governments.

Smt Aruna Sundarajan in her special address mentioned that the Chief Guest, Dr R S Sharma holds a very special position in today's event on Neutral DCI in buildings as has been the father of many such novel initiatives. She said that the subject of the workshop is of special resonance because she started her career in urban development. She was passionate about the fact that India is ahead of the world in all the aspects of the digital India except the DCI. Loss of GDP is significant due to this and digital infrastructure is required to move ahead. It is mandatory to have DCI at planning stage itself. As per her estimate, each household shall consume 1000 GB data per month by 2030. As we do not have infrastructure to deliver this to customers, therefore, need of the hour is to plan for it. There is explosion of content and IoT devices. There will be 30 billion connected devices by 2030 in the world. This phenomenon is not going to be confined to elite class but it will reach out to villages also. So plan, design, and build DCI powered buildings in urban and rural alike. Huge work is there for planners and designers. Standards are required apart from unbundling. She urged for neutral DCI buildings at the earliest for public good.

Dr R S Sharma at the outset, talked about Digital India initiative launched in 2015. When first framed, it had a vision with objective as how India must be look in the digital world after 25 years. With that vision in mind, the entire vision was broken down into smaller initiatives and structured accordingly. In each of the functional areas, digital connectivity

was the fundamental requirement. Thus, connectivity as a utility to citizen must be provided. For this connectivity, hard infrastructure namely OFC, Wi-Fi, Cable etc are to be created. Secondly there is need to have soft infrastructure like Digital payment, digital identity etc. Thirdly, digital empowerment is to be achieved. Electronic manufacturing is part of it. Thus, broadband proliferation was taken from it and Digital Public Infrastructure (DPI) became buzz word. Aadhar payment, Ayushman Bharat scheme, ONDC are horizontal digital infrastructure. Stack development is common to all these. So, open standards, open source were taken to build DPI. Share-ability is also important aspect. Today Indian cellular companies are transporting more data in the world as data tariffs have come down from Rs 250 per GB to Rs 7 per GB. In India tower sharing came into being and tenancy reached to 3 per tower. How we define priorities is important. RWAs are charging money from telcos is example of distorted priority.

Even though we typically think of telcos for hard infrastructure but they have their own limitations. Thus they only shall remain is not possible. Data demand is increasing thus all means to deliver the demand has to be thought through. Satellite is another area to work as unconnected are to be connected. Wi-Fi hotspot is also the area to work. PM-WANI has 150000 hotspots. The attitude that if others will do then my business will go is not the right attitude for nation. Telcos approach that we are doing is not the right approach. India need public Wi-Fi hotspots and cabinet approved it. Cabinet wanted no rules for it but we are framing rules. Carriage of internet traffic by Cable TV failed not because of technology but largely because Cable TV did not have AGR while internet service providers had to pay AGR and licensing became an issue. He advocated all stakeholders need to come together. Further he summarized for work on:

1. Work on Fixed line
2. Unbundle infra from service
3. Rules for neutral DCI must be neutral

Shri TV Ramachandran in his Vote of thanked all the Ministries, MoHUA, DoT, BIS and TRAI for supporting the event. He lauded TRAI for supporting the first trial of PM WANI. He also expressed that the innovation in DCI is more and more important. Need for indexing and rating the connectivity should be done fast. Further, he added that 70% data consumption is indoors, then contribution of it in GDP may be thought of 70% that is commensurate investments and focus on indoor connectivity therefore must be enhanced.

Technical Session-I: DCI, Technology and in-building solutions (IBS) and Standards

This session was chaired and moderated by Shri A.K. Mittal, Advisor (Networks), TSDSI. The other panellists were Dr. Nilesh Purey, Senior Vice President & CTO, GIFT City, Shri Arun Kumar, Scientist – E & Director, Civil Engg. Department BIS, Shri Devansh Deolkar, Scientist-D & Jt. Director, Electronics & IT Department BIS, Shri. G D Singh, CEO-

Mobility, iBUS, Shri. Mohammad Shahid Khan - Global Pre-Sales Lead, Connectivity Solutions, STL.

Shri A K Mittal stated that there had been problem for Telcos getting into the buildings to create in building DCI infrastructure and Telcos requested Department of Telecommunications to do something on it. This is how the work on Neutral DCI started and DOT is working with MoHUA and BIS. It took lots of efforts and many visits to different parts of India to get an idea of what to do and how to do. BIS evangelised this and MBBL and NBC code amendment came into existence. Now the revised NBC-2025 is due to come out next year and panel has started working on it. He applauded GIFT city for taking up the NBC code seriously and implementing the same. He expressed his desire to include street furniture into the NBC code. He is of the opinion that DCI or Atmanirbhar DCI is the real last mile. *“When wireless is there then there is no need of wired line” approach is not the right approach* as cables are essential part of the infrastructure in telecom like pathways in civil infrastructure.

Dr Nilesh Purey of GIFT City started his address highlighting that in the original name of the city T was not there. It was GIF city and it was Hon’ble PM who was then the CM of Gujarat added Tech to it. The GIFT is 886-acre IFSC city and is comparable to other financial centres across the globe. It has vertical development with 67% on commercial and 11% social infrastructure. GIFT is an urban development body and it has its own building byelaws. It is model green field smart city. It is an intelligent city with sensors, automation systems, communication, security systems, Energy management systems (EMS), and BMS.

Dr Nilesh highlighted following challenges in developing intelligent cities:

1. Lack of universal definition for smart city,
2. Lack of consciousness,
3. Lack of OEM agnostic specifications,
4. Lack of concern for data security,
5. Lack of consciousness for need for specially challenged persons
6. Resistance to change.

Thus, GIFT city worked on framing intelligent building guidelines and made Building Management Systems (BMS) mandatory for all buildings. Though it posed, a problem as different buildings had different solutions and there could not be a common monitoring system. A solution was developed to access and monitoring of all the BMSs across the buildings in the GIFT could be done at one place through a single platform or integrated BMS. However, integrated BMS leads to an additional cost due to lack of interoperability between various BMSs.

Cable guidelines were also issued wherein redundancy of duct was made compulsory after one of the international bank refused to be part of GIFT due to non-redundancy of the cable routes. For occupancy certificates (OC) it is mandatory to adhere to guidelines. And it is also important that at the time of award of OC, the building is fully ready for use.

Technological challenges faced by GIFT city are lack of interoperability of platforms and devices, proprietary systems, continuously evolving technology, and lack of availability of manpower. He also intimated that all the systems and devices are IPV6 complaint. There is also problem due to domination of 2-3 players in the market and systems do not have open standards, and common platforms, and thus challenges related to integration are difficult to meet.

The buildings have 6 Core fiber for every dwelling unit. In addition, every developer in the GIFT city has to create a telecom room (named “Meet Me Room”) where they terminate their fibre of all providers to service their client on the DCI infrastructure created by developer. Developers have not created any active component. Cooling as a service is provided in the city and tools have been installed for predictive maintenance so that GIFT city know problems even before the customers come to know.

Sh A K Mittal invited team from BIS represented by Shri Arun Kumar, Scientist – E and Director, Civil Engg. Department and Shri Devansh Deolkar, Scientist-D & Jt. Director, Electronics & IT Department for their presentations. The presentation was given by Sh Arun Kumar and he intimated that the National Building Code is not only for urban areas but also for Rural areas. There are 33 chapters in the NBC and in part 8 and section 6 there are details of telecom infrastructure including specifications and provisions. There is provision of Meet Me Room and Telecom Room, cabling system. Cable guidelines have been issued considering the life of 20 years and there is also provision for removal and replacement of cables with ease and comfort. Further, the NBC has made provision for keeping the building safe as data security is important aspect. The guidelines includes electronic access control and surveillance. Shri Devansh Deolkar added that there are 35 committees that are taking care of standards. 13th committee takes care of interconnect standards and work with ISO/IEC JTC 1/SC 6 ISO/IEC JTC1/SC 25. There are following standards for Information Technology Generic cabling for customer premises:

1. General requirements
2. Office premises
3. Industrial premises
4. Data Centres

He also informed that documents are under print for Data centers and industrial premises and there are different standards for Optical fiber, Ethernet and power cables.

Mr A K Mittal invited Shri. G D Singh, CEO-Mobility, iBUS for his presentation. He started his presentation by highlighting a case wherein an old person in a hospital is not able to do facetime with his grandchildren from the hospital, as there is no connectivity. He raised a big question as to why telecom connectivity is not available inside the hospital? The primary reason is demand of money or rentals by hospital from Telcos.

iBus is in business of providing MIMO, DAS, small cells to the telcos in the properties and reduces capex of telcos. He stressed that the neutral host is key today because shafts have limited space it cannot allow fiber or cable by all the operators or service providers. Thus, with neutral hosting there is no need to allow cables of all the operators. This creates win-win opportunities for both builders and operators as it enhances valuation & marketability of building while operators may focus on the market reach as telcos reach only high traffic sites only rather than low traffic sites.

Shri. Mohammad Shahid Khan - Global Pre-Sales Lead, Connectivity Solutions, STL stated that real estate sector contributes 6-7% of GDP and it will contribute 13% of GDP in 2025. Demand drivers for high-speed connectivity inside the buildings are the big spends on entertainment, large size projects, and Data centers for SMEs. According to him, largest expense center in IT is software while cabling or physical layer contribute merely 6-7% of the cost, while 90% of the problems are due to this physical layer. Thus, structured cabling is most crucial aspect in any building and it needs more attention than it gets today. He expressed that awareness on DCI in building has started and a boost will be required further.

Technical Session-II: Provisioning and Implementation of DCI in states/UTs

Sh T R Dua, the Session Chair, empathically made a point that with transition from 2G to 5G there has been transition of consumer requirements from Voice to AR, VR, IoT and thus it shows need to keep things future ready and last mile must be available as most of the traffic ~70% is consumed indoors. He explained difference between traditional DCI and Neutral DCI. In case of traditional DCI, the buildings are tied to a single service provider and thus less flexible while in case of neutral DCI there is open access to multiple service providers. Industry is feeling the necessity of Neutral DCI and demand is increasing day by day because it serves as backbone of service providers. Open and non-proprietary environment enhances connectivity and makes available seamless connectivity to devices. Neutral DCI is instrumental in higher returns on investments to service providers. There are real estate industry association CREDAI and their question is, "Why should we do it". He stressed that it becomes their USP so they must do it. They can market their properties like Morris Garages (MG) promote their cars as "Internet Inside". In times to come new buildings and smart buildings will be thinking of plug and play DCI. TRAI in Feb 2023 recommended DCI to be intrinsic part of building plan. There are international best practices for DCI in US, Singapore, Europe, and Hong Kong.

Mr R Srinivas intimated that as many as 17 states have adopted the provisions of DCI in their states by notifying amendments in their byelaws. Most of the states have Pan State byelaws except a few states such as Mumbai has separate byelaws. The notifications are issued after giving 60 days' time to public for filing objections. The effectiveness of the DCI is dependent on manpower availability for DCI, availability of online system for filing the request for DCI certification, clarity on who will certify. Governments must start empanelment of DCI professionals.

Mr B S Nagar, DOT TERM Cell Haryana LSA stated that Haryana is advanced state in notifying the amendments in byelaws. This has happened because of the fact that the LSAs are working closely with the state governments on National Broadband Mission. There is co-ordination committee headed by the Chief Secretary of the state in every state and when letters from DoT did not have any impact in the states then LSAs took up the issue through the state Broadband mission co-ordination committees. This is how LSAs approached in Haryana and adoption of DCI got notified in June 2023 after calling for objections from public. The major challenges being faced are the lack of guidelines on who is responsible and lack of manpower in terms of expertise and numbers is a challenge. Thus, LSAs requested states to issue certificates at their own and because of the above factors, states are taking undertakings before issuing the CC and OC.

Mr Ashok Kumar, Director-AS, DoT, intimated to the workshop about the chronology of the notifications and actions taken by various ministries and regulators. According to him addendum to NBC was notified by MoHUA on 22.2.2023. TRAI came out with its recommendations on Rating of Building or areas for DCI. Now TRAI is working on consultation paper on rating framework for DCI. TRAI in its recommendations has two parts one is mandatory and another is voluntary part. Challenges in implementation of the DCI are:

1. It is the telcos who can install active elements and no other agency can do so. Further, it is not only the installation but also maintenance of active elements, which is an issue.
2. Defining standards for indoor coverage is there
3. Issue of interoperability of telecom equipment in –buildings
4. Approval process needs to be defined – DoT may have supervisory role. MoHUA may be asked to take up the certification and approval work.
5. Training of resources
6. Supervision of DCI professionals
7. Development of portal

Mr Ganesh Bokade Director National Broadband Mission (NBM) intimated that NBM unit is coordinating with states and Union territories for enforcing the policies of DoT for example RoW rules, GIS mapping of telecom assets through (GatiShakti Sanchar Portal). NBM unit took the issue of DCI with states. Initially it was difficult to make them aware about it. Then LSA teams came into action and took up with NBM committee, as Chief Secretary is the head. Now 17 states started working on it and amended byelaws. He was confident that within 6 months all states and UTs shall get their bye laws amended.

Valedictory Session: Role of DCI for Smart Buildings/ Smart City

There was a brief presentation/summary of what had transpired till now.

1. 70% of the data consumption is inside the buildings and hence there is increased demand of connectivity inside the buildings.
2. 10% increase in broadband penetration leads to 1.39% enhancement in GDP

3. There is need of having open standards, open source and unbundling. Infrastructure should be unbundled from services.
4. Incentivisation to builders for adopting DCI is needed
5. Rating of building is important part and rating framework must come out as fast as possible.
6. There is need to create general awareness about the DCI and as of now 17 states have amended their MBBL.
7. Safety and security of data is important consideration inside the buildings and cable infrastructure inside the buildings must future proof

Mr. V Suresh President Good India Governance Foundation expressed concern about the fact that implementation of DCI must be there not only in in letter but also in spirit. State Government authorities taking affidavits for releasing CC and OC is not the spirit of the DCI regulations. For DCI to happen he expressed need to have proper guidelines, trained manpower, need of ecosystem of DCI professionals, and decentralization of entire process.

Mr Akhilesh Srivastava, was of the opinion that the operational issues are bound to happen after laws are notified. He gave example of AS 142 standards based VTS for all commercial vehicles were to be installed within certain period but even after so many years of notifications only 13% vehicles have AS 142 based VTS. Discussions are going on to track driver behavior through a 'Driver Behaviour Management Solution' in the commercial vehicles. 30 Billion Devices are going to be deployed worldwide by 2023 and now the concept of flexible houses is coming. Hence, there is need to have good connectivity and capacity building is an important issue to be taken care of to ensure smooth implementation.

Internationally DCI is being implemented in 3 phases:

1. Deployment of passive infrastructure
2. Active devices
3. Service based requirements

Interoperability and scalability are the important dimensions to work for DCI to happen.

Mr. Naresh Dhiren, of TPC, MoHUA in response to a question mentioned that Digital Connectivity Infrastructure must be at par with the utilities like water and electricity and builders need to plan DCI in the design itself that too with in the statutory framework. TRAI had issued the recommendations and to implement the recommendations a committee was constituted by DoT under DDG (AS). The draft report is there. Once it is finalised, the same will be circulated to states for comments and guidelines will be issues.

CREST Digitel's Vineet Sirpaul highlighted that 70% of data is consumed indoors and a good DCI is resulting in a 5% increase in rental in buildings and enhancing productivity through meaningful connectivity.

Mr. B S Umesh intimated that Prestige as a developer had started DCI for last 15 years and started implementing DCI even in remote locations. During this journey, they faced a number of issues. However, the biggest challenge are awareness about importance of DCI among various stakeholders and ownership of the digital connectivity.

Mr. Umang Das, Chairman, FTTX & IBS Committee of BIF beautifully summarized all the points raised in the workshop and expressed that such events will take place in the states also to create awareness about DCI and benefits of this will reach out to people which will ultimately lead to growth in GDP of the nation.
