CONSUMER PROTECTION ASSOCIATION
HIMMATNAGAR
DIST. : SABARKANTHA
GUJARAT

Comments
On
Rating of Buildings or Areas for Digital Connectivity

Introduction :

Digital connectivity – including wireless, wired, and satellite technologies – is the utility of the 21st century. It drives all aspects of smart and future cities, and key components of economies and societies. Digital transformation can result in productivity gains of 14 to 15 percent and cost reductions of 4 to 6 percent. Across the Asia Pacific region, connectivity is embedded in every aspect of our lives. The region will have a total of 3 billion mobile subscribers by 2025, whilst half of all new mobile subscribers around the world will come from the region. This growth could be transformative for all the sectors and industries that rely on connectivity.

In one McKinsey survey, just 16 percent of respondents said their organizations' digital transformations had delivered sustainable

performance improvements. Common challenges include unclear definitions of what digital means, an indistinct idea about what the transformation should accomplish, and poor integration of digital tools with business processes.

Digital infrastructure has emerged as an equally or arguably a more significant infrastructure necessity, as compared to the traditional infrastructure necessities such as power, water, and roads.

Economies across the globe are charting ways to make their digital infrastructure – which comprises the physical resources necessary for the use of data, computerized devices, methods, systems, and processes – more resilient, agile, and futuristic. The digital infrastructure has become indispensable to the functioning of a society and the quality of life of its citizens. All over the globe, countries have leveraged their digital infrastructure to proactively respond to the ongoing pandemic. India, being one of the most populous countries in the world, is uniquely positioned in the global landscape and has the potential to become a leading force in the new world order.

With nearly half a billion internet users in India, a host of indigenous digital services, platforms, applications, content, and solutions, are expected to transform the digital ecosystem. India could potentially see a fivefold increase in economic value from digital transformation by 2025, representing an attractive opportunity for global and local businesses, startups, and innovators to invest in emerging technologies (like AI, Blockchain, or drones) in ways that are customized to India's needs.

The rapid adoption of frontier technologies such as Artificial Intelligence (AI), Blockchain, Internet of Things (IoT) and the advent of the COVID-19 pandemic, has placed the entire digital infrastructure under immense pressure. With the Government of India progressively working towards goals such as Smart Cities and Smart Health, it is crucial for the nation to augment its digital infrastructure, to effectively utilize the frontier technologies in economic development.

With increasing smart phone penetration, surging online activity and a gigantic amount of data being generated, Data Centres could be of high importance for the world. Thus, it is the need of the hour to promote and create a framework for the development of robust digital infrastructure which could facilitate adoption of emerging technology areas such as 5G, IoT, artificial intelligence, machine learning, drones, robotics, additive manufacturing, photonics, nano-based devices, etc., and their applications in areas such as defense, agriculture, health, cyber security, smart cities, and automation, with special focus on solving real-life problems.

With the rapid evolvement of the ICT sector in the last years, the requirements of residential and businesses for modern telecommunication services have increased considerably. According to industry estimates, over 70% of mobile traffic is generated indoors. Modern telecommunications services are an integral and beneficial element in the life of the local community and in the national economy. Advanced telecommunications and retaining long-term tenants. The infrastructure for such services must be already planned at the very early stage of the design phase of a building to guarantee a future proof approach.

There should be a common and neutral standard for in-building design infrastructure for the rollout of DCI networks in new buildings/areas for the benefit of all stakeholder groups. This will not only promote competition on the infrastructure level but also give the user the freedom of choice between operators, guarantee reasonable investment costs for developers by setting reasonable specifications and clear processes for municipalities and government. Moreover, this initiative will support and promote the deployment of fibre networks as key infrastructure in the ICT sector.

Multiple policies and directives issued by various state-level departments on installation of telecom infrastructure have resulted in delayed roll-outs while absence of single-window clearances have added to the woes of infrastructure providers.

However, despite the potential that connectivity can enable, there are real challenges in rolling out digital infrastructure.

First, successful implementation of any kind of infrastructure requires a comprehensive and strategic approach, and even more so for digital infrastructure. Unlike other more traditional infrastructure sectors, digital infrastructure requires coordination across many moving parts, from mobile spectrum allocations – the radio frequencies that enable mobile connectivity – to balancing the rights of landowners; policy and legislation to ensure that no one (and nowhere) is left unconnected, and ensuring equitable access to – and ownership of – devices.

Second, it is insufficient to just provide access; we need 'meaningful connectivity', which is defined by the Alliance for Affordable Internet as quality internet access. We need to ensure individuals and businesses can prosper in our growing digital economies and societies – including enabling bandwidth-heavy requirements such as remote working and distance learning. We also need to get the basics right. 5G attracts many headlines, but by 2025 56% of all mobile subscribers around the world – and 65% of all subscribers in the Asia Pacific region – will still be using a 4G connection. A further 12% of users in Asia Pacific will still be relying on 2G or 3G technologies.

Third, affordability is also an important consideration. This includes both the affordability of data connections, as well as the affordability of devices. The region is making strong progress here, including through innovative brands and products. More significant, though, is the digital infrastructure financing gap. This is the difference between the funding required to achieve the needs of the digital economy (including digital connectivity and other foundations), and the actual investments being made. In the region, this gap is increasing, and could reach half-a-trillion dollars by 2040. Tackling this will require significant effort from governments across the region in driving private sector investments.

These challenges could have real impact on economic growth, including constraining innovation. For example, it may reduce the opportunities to build technology-focused and export-led industries around emerging technologies, smart cities, and other developments. It could also limit the ability of governments to meet the needs of citizens, by

hampering public sector digitalization and reducing the extent of digital public service delivery.

The Authority should be keen to constantly develop the telecom sector in the India to allow fair competition between the licensees by ensuring that telecommunication infrastructure is suitable to cater for their requirements in new domestic and business developments and buildings and to foster new competition to ensure innovative and state of the art services for end-users. This consultation paper is likely to bring faster implementation of 5G services and brings improved coverage through IBS.

Digital technology is transforming the way we manage our built environment and this collaborative work will pave the way for better data sharing that will put India at the forefront of Digital construction and smarter infrastructure that will be more cost effective, delivers better services and energy efficient.

This initiative embodies the aims of the construction sector deal, as we boost the skills and innovation within the industry.

Issues for Consultation :

Q.1. How can an ecosystem be created to design, deploy and evaluate DCI with good connectivity in a cohesive and timely manner? What would be the typical role and responsibilities of actors of the ecosystem? Please justify your response with rationale and suitable examples, if any.

Comments :

DCI is a very broad term that describes the process of creating and managing digital information about a built asset such as Building, Bridge, Highway, Tunnels and so on.

Over the next decade DCI will combined with the Internet of Things, Advanced Data Analytics and the Digital Economy, allowing us to plan more effectively, build at lower cost and operate more effectively.

In a very general terms action for DCI is necessary in a number of different areas like :

- Delivery mechanisms
- Commercial
- Technical
- Cultural
- Research requirements
- Domestic and international growth

- Sustaining the India's leadership position

We should create a mature digital economy for the built environment which delivers high performing assets and exceptional client value as well as a knowledge base to enable the Smart City and community members to thrive in our urban environments. This approach will attract the most talented individuals from diverse backgrounds into an industry seen to add demonstrable value to society.

Reductions in whole-life costs and carbon emissions, whilst improving productivity and capacity by using intelligent building information models, sensing technology and secure data and information infrastructure will be helpful. It will also help deliver other Government digital transformation objectives, such as smart cities, cyber and physical security and sensors through the Internet of Things.'

This DCI program should focused on:

- Providing departmental support and Indian Standards for DCI.
- Increased international trade and opportunities for growth for Indian companies.
- Development of the DCI program.
- Cyber security.
- Private sector investment and engagement.
- A series of early adopter projects focusing on DCI and manufacturing technologies.

The use of the Indian developed DCI standards will transform the construction sector towards improved productivity, competitiveness and efficiency and providing growth for Indian small businesses at the forefront of this technology."

Today marks a significant step in the journey to a digital economy for the built environment. The India has made a significant step in creating a world-class position in delivering capability, standards and capacity in the sector to reduce cost and increase value. The coming together of the DCI and smart city program will continue the commitment to providing jobs, homes, services and growth to the Indian economy."

The Construction model should integrate :

- ✓ Organization, procedures and information to effective plan,

- ✓ build and operate assets using cyber-physical structures, the Internet of Things, Data and services to associate the digital layer,

- ✓ comprising of the asset over its entire existence to establish an integrated environment incorporating organization, process and information.

The primary objective of construction should be to build a digital construction site that uses various techniques to track progression during a project's life cycle. Implementation should transform not just construction

process but also the company and project frameworks, transforming the fragmented constru8ction industry in to an integrated one.

The function of human resources in an industry world is shifting from machine operator to strategic decision creator. Robots support human in dangerous, stressful and time consuming tasks, for which humans must be adequately prepared for successful human machine partnership.

Barriers for the implementation :

1. Implementation cost

2. Technical acceptance

3. High Requirements :

A knowledgeable or qualified personals are required. It necessitates the recruitment and preparations of employees. Trained operators and maintenance personals would also be needed.
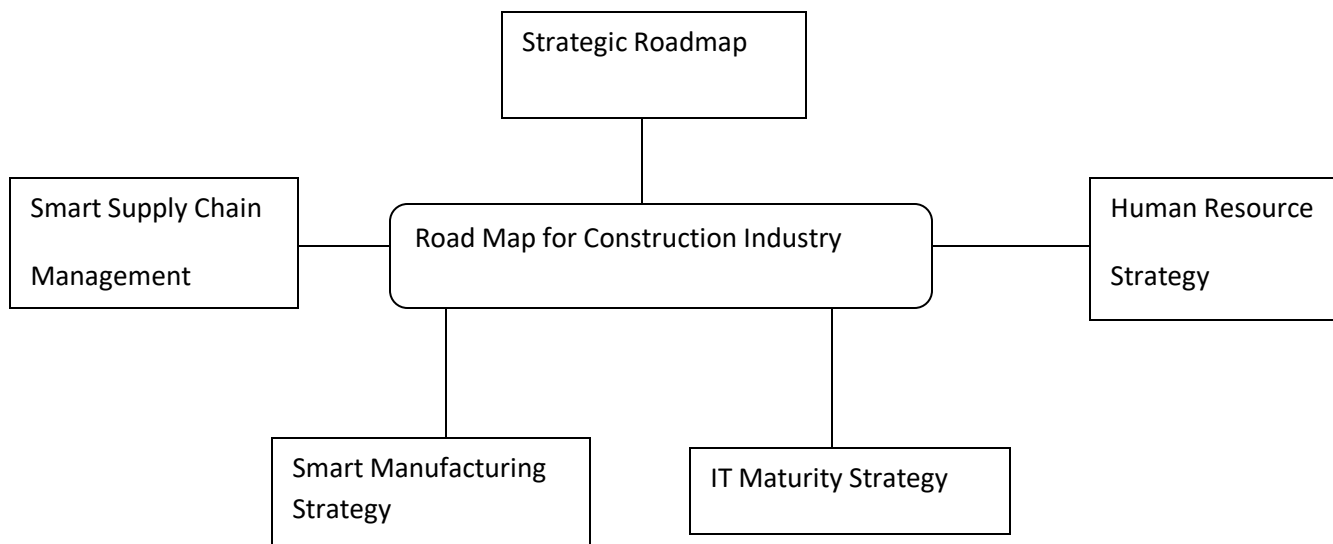
4. Lack of knowledge

5. Poor long term planning

6. Insufficient support.

Challenges for the construction Industry :

1.	Political - Governance	The building service industry is mostly made up of small to medium-sized businesses, which limits their ability to invest in technology with ambiguous benefits. Construction businesses will have to focus on regulatory bodies and authorities to help them execute these plans by financing schemes and strategic collaborations.
2.	Economical - Financial Transparency	Innovative technology is expensive to introduce. The ambiguity of a payoff makes it even harder. Such charges, such as preparation and infrastructure maintenance, will be added to the list, making it more difficult to incorporate.
3.	Social - Cultural Habits	The incorporation will have a significant impact on various stakeholders involved in construction processes.
4.	Technological - Technical Challenges	To fit the construction environment, equipment must be redefined and strengthened. The need for improved expertise to operate these advanced systems, as well as the need for sturdy equipment elsewhere, will add to the difficulties of integrating it into standard everyday activities.
5.	Environmental - Organizational Processes	Changes in operational structures (horizontal, vertical, and end-to-end) would cause traditional implementation procedures to be distorted in some way. To effectively respond to the new changes and improve development, common practices will need to be revamped.
6.	Legal - Uncertain Regulatory	Lack of consistency in the division of roles held by each stakeholder, as well as legal issues posed by flaws compounds the complexity.
7.	Security - Threat Risk	Information and data sharing will be vulnerable to attacks and placed in vulnerable circumstances, creating a slew of IT security issues regarding data privacy and security.

Implementation of DCI :

There should be a strategic roadmap to take every step and decision more transparent and understandable. To state the highlighted challenges, a simple roadmap is presented as guidance for the digital transformation of construction. A comprehensive roadmap should have a specific framework for each phase.

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                        │  Strategic Roadmap  │
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┌──────────────────┐   ╭───────────────────────────────╮   ┌──────────────────┐
│ Smart Supply Chain│───│ Road Map for Construction     │───│ Human Resource   │
│                   │   │ Industry                      │   │                  │
│ Management        │   ╰───────────────────────────────╯   │ Strategy         │
└──────────────────┘         │              │              └──────────────────┘
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                 ┌───────────────────┐  ┌────────────────────┐
                 │ Smart Manufacturing│  │ IT Maturity Strategy│
                 │ Strategy          │  │                    │
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1. Big Buildings should have digital connectivity rating on the line of green   rating.

2. The new rating should be based on the quality of telephone and internet   services offered in the buildings.

3. A five star rating system for apartments, office, railway stations, airports   and malls should be implemented based on the digital connectivity   standards of the buildings.

4. The rating should be made mandatory for public places like airports.

Focus on fixing pain points, not installing IT solutions :

Around the world, E&C companies are upgrading and replacing legacy back-office systems while also implementing new systems and software to increase engineering and field productivity. However, companies can focus too much on IT, pursuing improvements to systems and software as ends in themselves. We often see E&C companies deploy cutting-edge technology tools before they have figured out whether and how those tools can improve their operations. This tech-first approach can lead to digital "organ rejection," whereby a solution fails to deliver visible benefits, and the workforce, noticing this, does not adopt it.

E&C companies can increase the likelihood that digital technologies will make a positive difference by first identifying operational changes that will improve performance, then defining digital use cases that will enable those operational changes. This process-centered approach helps focus each use case on a real business need while suppressing the impulse to chase technology trends. Use cases defined in this way deliver greater benefits while building the understanding and conviction of the workforce, from the CEO to managers and frontline workers in various functional

groups and decentralized business units. Such use cases are also easier to replicate on multiple projects and to introduce to new workers.

Q.2. How would the ecosystem proposed in response to Question no.1 ensure that created infrastructure does not get monopolized? Please justify your response with rationale and suitable examples, if any.

Comments :

India continues to be a vibrant competitive economy. But the rising monopoly trends in some segments are disturbing signals. This emerging monopoly trends are the consequences of many factors. Shortsighted regulations, governments trying to squeeze maximum revenue from the industry and a judiciary interpreting the law in letter rather than looking at the issue from a holistic perspective etc.. All have contributed to this undesirable trend.

- A monopoly is a company that exists in a market with little to no competition and can therefore set its own terms and prices when facing consumers, making them highly profitable.
- While monopolies are both frowned upon as well as legally suspect, there are several routes that a company can take to monopolize its industry or sector.
- Using intellectual property rights, buying up the competition, or hoarding a scarce resource, among others, are ways to monopolize the market.

- The easiest way to become a monopoly is by the government granting a company exclusive rights to provide goods or services.
- Government-created monopolies are intended to result in economies of scale that benefit consumers by keeping costs down.

Economic reform in the provision of infrastructure facilities and services has made it necessary to consider the need for, and role of, regulation. Following key issues should be addressed by policy makers in implementing reforms, including:

> - The regulatory requirements arising from alternative methods of creating competition in the infrastructure industries, particularly in respect of market access and price regulation;
> - The pricing objectives and price setting policies available to regulators of natural monopolies;
> - The merits of regulation versus competition in the provision of infrastructure facilities and services;
> - Price-capping mechanisms in the infrastructure industries;
> - Methods of measuring efficiency;
> - Methods of regulating quality;
> - Franchising and its limitations in the infrastructure industries;
> - Public service obligations and equity;
> - The implications for regulation of globalization and
> - International competition.

1. Lack of proper regulation in this sector can lead to excesses culminating in systemic problems impacting the entire economy

2. Capitalism promotes competition. Competitive markets benefit all stakeholders. But capitalism needs effective regulation. In the absence of competition, monopolies emerge by exploiting consumers, destroying rivals and corrupting the system through their enormous power.

3. With humongous wealth and dominant market position, mega corporations might become monopolies eliminating the benefits of competition. The objective of anti-monopoly legislation should be to prevent the emergence of monopolies.

4. The Competition Act, 2002 is not aligned with the antitrust laws of other top countries. Therefore, India should take cues from them and implement them in the Indian market.

5. Amendments with regards to the holding of 'dominant position' in the market, because holding a dominant position is not seen as a problem but the abuse of the position is a problem.

6. For in-building cabling the use of a multi-fibre cable should be mandated to satisfy the requirement for competition on the one hand and to optimizing investments on the other hand. At least one dedicated fiber from each competing service provider should be accessed each home. Additional spare capacity should be foreseen which eventually can be used for a possible new licensee in the future.

7. The guidelines should allows a seamless service provisioning without necessary intervention in the building in case of an end user switches his contract from one service provider to the other. In case of more than two service providers the user has to choose which operators should be installed in the home/office consolidation cabinet. This hassle-free choice for the end user will stimulate competition on the level of service delivery performance.

8. The dimensioning of required spaces for the telecommunication equipment satisfying the above scheme need to be optimized through sharing.

9. With sharing of rooms, floor spaces, ducts, cable trays, racks and cables the cost impact of network infrastructure elements will be regarded overall as marginal.

Q.3. How would the ecosystem proposed in response to Question no.1 enable DCI Designers to factor in the digital connectivity requirements of the existing and/or prospective users of the network? How can such requirements be gathered at the stage of construction of a new building or at the time of upgradation or expansion in case of pre-existing DCI? Please justify your response with rationale and suitable examples, if any.

Comments :

To optimize the overall process among the licensees a lead operator should be nominated on a per project basis. The lead

operator for a specific project should be the single point of contact between the licensees and all other stakeholders like developers, building or property owners, municipalities or ministries and accordingly shall take responsibility of coordination.

Lead Operator :

There should be a single window mechanism or the lead operator who can assist the property developers through a "No Objection Certificate" (NOC) process that includes OSP design drawing validation, ISP design drawing validation, validating ISP material to be from the pre-approved manufacturer list and site inspections during implementation. Although electronic communication systems like email and online platforms should be used widely for this task, there should be merits in having also face to face discussions with the lead operator if needed. Therefore operators are encouraged to foresee physical presence in an area/emirate if this would ease over all processes.

* Master plan Developers/Building developers should be encouraged to engage with lead operator at an early stage so that any process and/or design issues may be resolved. If property developers or tenants have special requirements that may not be covered by these guidelines it is necessary to engage with lead operator's design teams at an early stage of development planning, to enable seamless delivery of premium telecommunications services at launch.

Implementation of new rating in private buildings :

There should be enough space on the roof of the buildings to erect optical fiber cables. At present, many buildings in the country do not have the facility to erect optical fiber cables, and antennas meant for increasing mobile phone range.

Building ratings should be based on duct availability and sufficient space for IBS. Such a framework is needed for older buildings voluntarily should be thought.

Building completion certificate should include validation of in-building wiring and certification of creation of common telecom infrastructure by local development authority / municipality similar to the rules mandated for fire safety, rain harvesting, electricity, waste management. · The common telecom infrastructure shall not be exclusive right of any individual service provider (be it IP or a TSP) and shall be open to sharing by all operating TSPs on mutually decided technical and commercial arrangements. The in building access to all interested TSPs should be ensured by building owners on a nondiscriminatory basis. · The customer shall have the choice to select any service provider of his choice available in the premises.

Q.4. How would the ecosystem proposed in response to Question no.1 enable DCI Evaluators to get requisite information to evaluate and ensure that the designed or deployed network

would meet the requirements of end users? Please justify your response with rationale and suitable examples, if any.

Comments :

1. Special agencies should be deployed to undertake yearly inspection in the buildings for the digital connectivity rating and then award certificates. As part of the rating system, the agency should first conduct telecom speed testing and internet speed testing.

2. A special mobile App should be made available to the users of the internet and telephone in a big buildings. The details of digital connectivity readings at different points of time can be collected using this mobile App.

Q.5. How would the ecosystem proposed in response to Question no.1 ensure that upgrades and expansion of the DCI are done from time to time and continue to meet rising demands? Please justify your response with rationale and suitable examples, if any.

Comments :

1. Upgradation procedures depends on the deployment, and on how the customer want to balance the level of user impact with the amount of time required to complete the upgrade. One must identify the sequence that they will follow before they are ready to perform the upgrade process.

2. Upgradation in residential areas is less needed because of the less uses of data.

3. Upgradation is costly/or disruptive to operation also.

4. Business/Commercial centers should upgrade infrastructure regularly. As data volume grows the changes needed. Antiquated infrastructure is less likely to keep pace which can lead to slow performance or interrupted processes. In addition, outmoded security protocols of aging operating systems or physical structures make it easier for hackers to exploit vulnerabilities. By upgrading systems regularly, companies can ensure improved efficiency, productivity, sustainability, and above all, security.

Q.6. How would the ecosystem proposed in response to Question no.1 ensure that the TSPs' networks are planned, designed, deployed, and upgraded to serve the DCI requirements in a timely manner? Please justify your response with rationale and suitable examples, if any.

Comments :

A common framework should ensure a future proof approach with regard to in-building design of telecoms networks for DCI deployment. The provision of more detailed planning guidelines should guarantee a high quality network operated by the recent service providers but in addition taking the appearance of a further licensee into account. With this it fosters competition by a neutral, common approach supported

and justified by international best practices, tailored to the needs of the country. To ensure a proper application of the guidelines from the beginning of a development a so called "No Objection Certificate" – NOC admission and a corresponding process should defined. In this process the focus should lies on the early design stage of any new building, villa, and warehouse development in the country. Based on the construction drawings the professional implementation of the in-building design manual should be assessed and the NOC issued. This forms the basis to obtain a building permission for the project (covering the part of the telecom infrastructure).

In a second step, after a development is realized, clear processes for testing and acceptance of the infrastructure come in.

The NOC, the respective process and the testing/completion of the in-building cabling for DCI deployment should be outlined in this guidelines on a general level. It should be up to the licensees to agree on a detailed specification of this process. Developers should be encouraged to engage with the Operators at an early stage so that any process and / or design issues may be resolved and to get it "First time right".

To keep the manual up to date and to guarantee always for the best technical and commercial approach in the future, the guidelines should be reviewed on a regular basis taking new developments and experiences into account. A close dialog with all stakeholders in parallel is the basis for constant improvement of the manual.

Q.7. How can an ecosystem be created to build capacity requirements of skilled professionals such as DCI Designers, DCI Engineers, DCI Evaluators? What would be the typical role and responsibilities of actors of the ecosystem? Please justify your response with rationale and suitable examples, if any.

Comments :

7.1 Skill is yet to become aspirational among youth. The pathway to career growth through skill development is yet to strike among the unemployed/under employed. Training Institutes are continue to be under-utilized, lack of trainers, inadequate training facilities in nearby villages and small towns persists. The skill development efforts remained fragmented and in silos.

7.2 Skill Development and Entrepreneurship enables skilling and promotes the culture of entrepreneurship to ensure sustainable livelihoods for all citizens in the country. Innovative mechanisms are required to address the critical challenges in ensuring access, equity, aspirations, quality and availability of trainers.

A. STRENGTHENING STATE SKILL DEVELOPMENT MISSIONS (SSDMs) an Integrated Delivery Framework :

(i) The SSDMs were set up in 2010 with the broad objective of providing integrated delivery framework at the state level so as to bring synergy, oversight and effective coordination in the implementation of skill programs across the Departments. However, it is observed that most States have not been able to mobilize, implement and monitor skilling programs in an integrated manner. It is felt that their capacity to undertake such initiatives has been resource constrained both in terms of financial and human resources. Therefore, we feel that it is necessary to strengthen the SSDMs, to enhance their capacities and role. Therefore, we recommend that the State Skill Development Missions should :

a. Undertake all major activities of coordinating and harmonizing skilling efforts; be responsible for assigning targets among digital services in the State;

b. Monitor progress of schemes;

c. Undertaking efforts for convergence of programs;

d. Addressing issues of up-skilling and re-skilling; take up skill gap studies;

e. Liaise with the private sector and address all policy issues including quality of training, assessment and certification in consultation with Central Ministries and TRAI.

ii.   SSDM must become single nodal point to launch Sub- Missions in Telecom sector important to the State like construction, and services including repair and maintenance.

iii.   We feel that the convergence should be at three levels, viz.

    1.   Within the Center,

    2.   Between Central Ministries & State   and

    3.   Within State Departments.

This would facilitate convergence of Schemes & pooling of resources to channelize the same for Telecom sectors where there is strong demand for skilled work force to achieve scale and ensure effective outcomes. This requires maintenance of a comprehensive database of Schemes, standardization of costs, industry partners and training providers as well as assessing and certifying bodies. The details of trainees as well as prospective trainees should also to be maintained by SSDMSs as in Rajasthan and U.P. The funds under the Central schemes should flow directly to the SSDMs.

iv.   Ensure effective coordination and monitoring of skill development initiatives : For this, a three-tier structure at State, district and block level for every SSDMs must be created. A District Skill Development Agency can be linked to the District Rural Development Agency to coordinate skill efforts at district level.

v.   National Skill Development Corporation (NSDC) may also leverage its strengths to conduct regular capacity building programs at the

State/regional levels in consultation with key stakeholders. All skill training must be linked to outcomes. Suitable key performance indicators should be developed and monitored by the SSDMs in respect of State initiatives. NSDC may also support SSDM to conduct annual skill mapping to identify the new emerging areas of requirements of telecom sectors.

vi.   Set sectoral priorities at State level based on an independent assessment of the needs of Telecom sector and the formulation of appropriate policies to enhance the qualitative and quantitative skill availability for this sector.

vii.   Role clarity is essential in terms of field level of implementation of skill development programs. It would be desirable for Central Government agencies including NSDC to confine themselves to national level standardization, accreditation, certification, advocacy, capacity building, conduct of impact assessment, provision of financing, framing policy and legislation. Actual training delivery should be routed through and monitored by State Government agencies/SSDMs which are better placed to mobilize candidates for training.

viii.   Open Sector Skill Council (SSC) Chapter in each state, based on sectoral priority of the State, for better industry linkages and to ensure that skills imparted in a State are recognized even outside the State.

ix.   Building capacities of Sector Skill Councils to build capacities of SSDM's to ensure that training is aligned with National Occupational Standards so that students are ready for job post training. A joint working group under SSDM with SSC can be set up

x.   A National Skill Testing Authority with representation from Central and State governments, besides the industry can be set up to facilitate recognition of skilled youth having foundation level skills and their entry into higher level skill education programs.

xi.   Clarity in the organizational structure of skill development should be established. At the Central level there is the Ministry of Skill Development as well as the National Mission for Skill Development. Underneath this parallel structure there functions the National Skill Development Agency and under it the National Skill Development Corporation. Each of these institutions liaises with the State Governments in skill development training. The State Governments have to interact with multiple agencies for multiple tasks. This duplication of organizational structure at the Centre be streamlined and strengthening of State Skill Development Missions needs to be concentrated upon as that is where the whole action lies.

xii.   Various skill development schemes should be introduced by the different departments.

B.   Achieving Scale & Relevance through PPP

➢ Industry to be incentivized to set up training institutions in PPP mode in industry clusters to facilitate availability of trained manpower and to adopt existing government ITIs and Polytechnics.

➢ Local Industry to be involved for curriculum development, training modules, provision of equipments, training of trainers, opening skill development centres and taking apprentices.

- Industry can help in Developing a database of instructors as also resilient system for selection of Training providers.
- The States Government can incentivize the public sector or the private industries operating either within the State or in neighboring regions to involve in the skill development efforts of these States through their SSDMs in less industrialized as well as difficult terrain.
- Skill Development programs and skill training providers should get an extension of service tax exemption for the next 5 years.
- Skill training in manufacturing sector should be incentivized in all skill development programs to achieve the broader objective of Make in India program".

C.   Making Skills Aspirational by involving Local Bodies/NGOs :

CAGs and Local Bodies to be used for skill mapping and creating a data base of youth at local level.

D.   Focus on Outcome

- Union Government initiatives in strengthening the National Career Guidance Centre at the district and block level, integrating with the Digital Market Information System should be facilitated by the SSDMs. This would facilitate to track the youth receiving skill training and moving to placement either as self-employed or wage-employed.
- LMIS/National Career Service Centres could be the medium where the success stories that are documented can be shared so that it provides a medium for the youth to explore the possibilities of its up-scaling/replication.

E. Various issues relating to improving quality, relevance, quantity, aspirations , mobility and financing of skill development at length should be looked for. The major points are as follows :

1. Integrated Delivery Framework for Achieving Convergence :
   - The State Skill Development Missions (SSDMs) should evolve Into a coordinating body to harmonize the skilling efforts across Telecom departments/ private agencies/voluntary organizations etc.. The common norms should be announced at the central level and may be adopted by the SSDMs so as to have State- specific guidelines for skill development programs.
   - For decentralized implementation and to ensure effective coordination and monitoring of skill development initiatives a three-tier structure at State, district and block level for SSDMs can be established.

   - Determination of sectoral priorities at State level based on an independent assessment of the needs of telecom sector and the formulation of appropriate policies to enhance the qualitative and quantitative skill availability for this sector based on conduct of regular skill surveys.

   - SSDMs should have the overarching power to pool across the resources and to utilize according to priority. The inter-linkage

of the SSDMs with the industry, training providers, Sector Skill Councils, NSDA should be maintained at the policy formulation and implementation level.

- Sector Skill Councils should assist the State Skill Development Missions to align training program with NSQF.

Q.8. How would the ecosystem proposed in response to Question no.7 ensure that relevant training courses are available in the country? Please justify your response with rationale and suitable examples, if any.

Comments :   Mentioned Above.

India is well-progressing towards digital education, backed by rising adoption of digitization by universities and colleges, increasing internet penetration and soaring demand from students. As per RedSeer Consulting, the online education market (higher education and lifelong learning market) in India is forecast to reach ~US$ 5 billion by 2025, driven by the government's focus on designing online education programs, strengthening digital infrastructure across the country and catering to the rising demand for upskilling among students.

Digital education has been significantly driven by the government's focus on strengthening digital infrastructure in the country, including providing internet connectivity in the remote areas. According to IAMAI-Kantar Cube report, active internet users in India is estimated to reach 900

million by 2025, up 45% over 622 million active internet users in 2020. Also, internet penetration in the country is expected to reach >55% by 2025.

Q.9. Whether the training courses proposed in response to Question no. 8 are already being offered by any organization or institution that can be recognized for the purpose? If yes, please provide a list of organizations offering such courses. If not, how specialized courses can be designed to meet the requirements? Please justify your response with rationale and suitable examples, if any.

Comments :   Yes.   Mentioned above

As part of 'Digital India' initiative, the government also started e-Education initiative to provide online education in remote and urban areas using smart phones, apps and internet services.

The Indian government has taken several initiatives (e.g., PM eVIDYA program, DIKSHA, etc.) to make it at par with some global online education best practices and relaxed regulations for universities and colleges to offer extended online and distance learning opportunities to students.

Digital Education Initiatives and their Purposes :

Key initiatives taken by the Indian government to boost digital education activities are as follows:

- **_National Digital Educational Architecture (NDEAR)_**

In the Union Budget 2021-22, the Indian government established the National Digital Educational Architecture (NDEAR) to strengthen digital infrastructure and support activities related to education planning. The NDEAR aims to offer distinct education ecosystem architecture for advancement of digital infrastructure in the country and guarantee autonomy of stakeholders, especially states and UTs.

- **_PM eVIDYA Programme_**

The government introduced the PM eVIDYA programme in May 2020 to make e-learning more accessible for Indian students and teachers and promote & strengthen digital education in India. The programme aims to converge all activities related to online/digital education and is expected to benefit ~25 crore school students.

Under this, top 100 universities were permitted to begin online courses, provide better learning prospects to 3.7 crore higher education students and enhance e-learning by relaxing regulatory framework for distance/open/online education.

- **_SWAYAM_**

In 2017, the government launched Study Webs of Active Learning for Young Aspiring Minds (SWAYAM) to offer an integrated platform for online courses at affordable costs to all citizens, especially the underprivileged section in the country.

The portal hosts Massive Open Online Courses (MOOCs) to offer quality education on various subjects for students (from Class 9-12 to Under Graduates and Post Graduates).

- ***Virtual Labs***

The Government of India introduced a pilot virtual lab in 2009 and the main one in 2010 to enable undergraduate and post-graduate students (pursuing science and engineering courses) remotely access the labs and enhance their study experience.

The virtual labs offer students a Learning Management System and various study aides such as video lectures, web resources, self-evaluation and animated demonstrations.

Advantages

For strengthening digital education in India, the govt. eased regulations on online education and finally allowed universities and colleges to extend >20% of a degree online from 2020 onwards. This initiative has enabled Indian institutes to further improve their portfolio of higher education internationally.

Many EdTech businesses (e.g., upGrad, Virohan, BYJU's, etc.) have also gained traction in the recent years and are determined to deliver unparalleled learning management resources, such as blended learning, 3D and DIY kits, and AI-based innovative and engaging learning. According to a report published by RedSeer and Omidyar Network India, the EdTech

market in India is expected to reach ~US$ 3.5 billion by 2022, due to higher uptake of EdTech offerings among students.

Q.10. Is there a need to establish a council on the lines of "Council of Architecture" (CoA) to regulate minimum qualifications, additional specialized courses and practice of DCI profession in the country? Please justify your response with rationale and suitable examples, if any.

Comments :   No.

1. The COA has remained a body which primarily maintains a registry of Architects and monitors the minimum standards of architectural education in India. Unlike England's RIBA or USA's AIA, it is not an Institute that has a dual purpose of registering and regulating the profession, and also as a professional body entrusted with promoting the profession of architecture by organizing and uniting in fellowship the Architects of India.

2. The COA, by virtue of the limitations of the Act and its purpose, has not endeared itself to its Registrants. Some realized that they are not actually "members" of the COA. The COA registers and looks over the control of education in countless schools of Architecture. The problems of Architects have remained and increased. They still get paid less. They still get scant acclaim for their efforts in society. They still have to beg for their dues in Govt. projects. They still do not get recognized as Architects on foreign shores.

3. The COA has not evolved into a necessarily popular organization in the minds of young architects throughout India, because of several limitations in the Act that binds it.

4. Though COA is aimed at increasing the efficiency through enhanced knowledge, they cannot automatically result in growth. Neither does economic growth by itself translate into better social sector outcomes. A definite policy paradigm that prioritizes social welfare is needed. Apart from this there is no clarity on what constitutes COA and what the impact of COA is on growth.

Q.11. Whether the requirements of additional specialized courses and practices of profession would vary depending upon the size of work or kind of work involved in a particular DCI project? Please justify your response with rationale and suitable examples, if any.

Comments :   No.

IIT Jodhpur has started smart and digital infrastructure by introducing a unique B. Tech program in Civil & Infrastructure Engineering :

Unlike the traditional Civil engineering programs being offered by other higher education institutes, IIT Jodhpur has a set of dedicated core and elective courses. These courses allow students to earn a specialization in either 'Smart infrastructure' or 'Environmental engineering' in addition to the regular B.Tech.

Indian Institute of Technology Jodhpur offers a unique B.Tech program in Civil & Infrastructure engineering. The curriculum of Civil & Infrastructure has introduce students to a wide variety of fields in advanced Civil engineering such as infrastructure planning and designing, a good knowledge of Artificial Intelligence and Machine Learning, Smart materials and sensors, and security of infrastructure against physical and digital threats.

With this one-of-its-kind Civil engineering program, IIT Jodhpur envisions building a new class of engineers who have:

➢ A strong foundation in the analytical, experimental, and computational methods to study various aspects of civil and infrastructure systems

➢ A thorough understanding of green and sustainable materials, practices, and principles to design resilient infrastructure systems

➢ An ability to monitor and evaluate the health of old structures and renovating to bring sustainability

➢ An ability to use transformative technologies and multidisciplinary knowledge in planning, design, execution, and continuous monitoring of infrastructures

➢ A Bachelor's in Civil and Infrastructure Engineering will open several career paths not only in conventional areas but also in interdisciplinary areas. Notable mentions include Smart and Sustainable Infrastructure Engineering (Energy, Environment, Transportation, etc.), Digital twins and asset management, and

Application of AI & ML, IoT, and Cyber-Physical Systems in built-in infrastructure, among others.

Creation of Digital Platform to hire services of professionals and procure products :

Q.12. Whether creation of a digital platform to hire services of professionals would help Property Managers in creation of DCI? Should there be a feedback mechanism to assess quality of services delivered by professionals? Please justify your response with rationale and suitable examples, if any.

Comments :   Yes.

1.   They can help them to save time and money in the long run by taking care of tasks that they may not have the expertise or experience to do.

2.   Additionally, professionals are typically licensed and insured, which can give   their peace of mind knowing that you're dealing with someone reputable.

3.   Professionals can quickly fix problems that would take their hours or days to figure out on their own.

4.   They have the knowledge and experience to handle any problem or emergency.   But

The following characteristics of the construction industry make digital transformation particularly challenging:

- ***Fragmentation :*** Construction projects are typically fragmented along the value chain, with specialists generally operating in one or a small number of disciplines. And each step in the value chain involves multiple layers of contractors and subcontractors. Implementing digital solutions across a project thus requires coordinating changes among organizations—a task that is especially hard, given the short-term and often adversarial nature of construction contracts.

- ***Lack of replication :*** Construction projects are nearly always one-of-a-kind endeavors, with unique requirements that necessitate bespoke design and delivery approaches. Since these approaches are seldom repeated, it is harder to introduce changes across numerous projects, as full-scale transformation requires. The exceptions are multiyear major projects, on which companies can establish processes and reinforce them over time.

- ***Transience :*** Ordinarily, a new construction project will involve a new set of organizations working together. Project teams, too, are rarely consistent. Contractors face similar challenges at the enterprise level, at which workforce turnover is high. Transience at the project and company levels makes it difficult for E&C companies and their subconsultants and subcontractors to establish new ways of working and build capabilities that carry over from one project to the next.

- ***Decentralization :*** Large E&C companies tend to be highly federated, with business units and divisions following their own

processes rather than standardized ones, not least because many have grown by acquiring smaller firms. Individual projects take place at sites that are far from a company office. And few sites are conducive to teaching workers how to work in new ways or use advanced technology.

These characteristics of the E&C industry make it harder for companies to develop digital solutions that they can apply to multiple projects. More commonly, individual teams and business units will develop their own digital solutions, without coordinating with others. The result is a proliferation of subscale, often competing tools within a single company.

Q.13. Whether creation of a digital platform for procurement of certified products would help Property Managers in creation of DCI? How would the certified products for the purpose of DCI be identified and updated on the platform? Please justify your response with rationale and suitable examples, if any.

Comments :   Yes.

Great connectivity isn't just about speed. Using several metrics including:

Connectivity quality,

Infrastructure,   and

Readiness.

How would the certified products for the purpose of DCI be identified and updated on the platform?

Comments :   **By BIS marking.**

Historically, site workers hadn't sent feedback to a supplier on all defects in the elements that the supplier was making. When they did send feedback, it was anecdotal, unstructured, and difficult to act on. Defects persisted, so workers needed either to fix defective products or to wait for replacements. This unplanned rework increased labor costs and caused delays.

The company saw an opportunity to correct the problem by improving the mechanism for passing feedback between the site team and the supplier. The site team used a mobile app to tag defects against specific elements in the BIM model and store them in a common data environment (CDE), a single repository for information about the project. The supplier monitored defect reports in the CDE, then ran root-cause analyses with its factory team to diagnose and reduce defects. The resulting improvement, a 12 percent reduction in rework hours at the contractor's job site, demonstrated the benefit of smoothing communication between these previously disconnected organizations.

DCI ownership and upkeep models

Q.14. What may be the possible models of DCI ownership and its upkeep? Whether co-ownership models would help in aligning incentives in realizing connectivity that would meet expectations of the end users from time to time?

Comments :

Partnership has been essential in many of these successes. This includes partnerships between the public and private sectors, particularly local authorities and cities and digital connectivity providers. More widely, and reflecting the international dimension of connectivity, international partnerships are proving – and will continue to be – especially important.

There can be short term and long term contractual solutions to facilitate the deployment of telecoms equipment. There should be three main players for the DCI ownership and its upkeep :

1. Asset Owners – Local Authorities and third parties listing assets on the platform
2. Network Operators – Mobile Network Operators and
3. Other organizations potentially looking to lease listed assets.

Co-ownership model may not be helpful as there will be more than two stakeholders.

Should there be a need to specify terms and conditions for entities owning and responsible for upkeep of DCI to function in a fair, transparent and non-discriminatory manner? Please justify your response with rationale and suitable examples, if any.

Comments :   **Yes.**

1. Asset – a location that can potentially be leased for the purpose of installing telecommunications or other hardware

2. Asset Owners – Local Authorities and third parties listing assets on the platform.

3. Network Operators – Mobile Network Operators and other organizations potentially looking to lease listed assets.

Enabling new Ecosystem by Technical requirement specifications for DCI in Building Codes (NBC)

Q.15. As one solution might not be suitable for all types of buildings, whether current requirements stipulated in the National Building Code of India, 2016 would be required to be evolved and prescribed ab initio to make it more appropriate for DCI requirements? Please justify your response with rationale and suitable examples, if any.

Comments :   Yes.

1. Rating the buildings based on their readiness for appropriate digital connectivity and inside coverage, indicating the need for changes to the Real Estate Regulatory Authority (RERA) or the Real Estate Act, 2016, and the urban development framework.

2. Right-of-Way (RoW) rules required a national standard policy, a one-time administrative charge, and approval within 60 days.

Q.16. Whether NBC needs to prescribe a separate classification of buildings for the purpose of DCI? If yes, which factors should be considered to make such a classification? If not, how to accommodate DCI specific requirements in the existing classification of buildings by the NBC? Please justify your response with rationale and suitable examples, if any.

Comments : No.

Q.17. Whether there is a need to include DCI Professionals as Persons on Record as typically done in building bye laws or development regulations? Or registration with the Council proposed in Question no. 10 would suffice to practice profession across the country as followed in the case of Architects? Please justify your response with rationale and suitable examples, if any.

Comments :

1.   India Started developing regulatory institutions with the introduction of reform in 1991. But the regulatory environment which has developed even a period of time does not seem homogeneous across sector. India still ranks very low in terms of the enabling nature of its business environment and unnecessary regulatory burdens are imposed upon business and investors.

2.   Registration with council can be suffice to practice profession across the country as followed in the case of Architects because DCI is included in the curriculum.

3.   Registration process should be simplified.

Q.18. How can the clearances or approvals required for DCI at various stages of construction of building may be incorporated in building bye laws? In typical building bye laws, there are provisions for getting clearances from central government e.g., in case of civil aviation, defense and telecom being a central subject, what role can be played by the central government in giving such clearances or granting such approvals? Please justify your response with rationale and suitable examples, if any.

Comments :

Central Government associated with state authority can give clearance for DCI at various stages of construction of building.

It should be simple, transparent and time bound with minimum government and maximum governance.

Need to introduce a special class of Infrastructure Providers

Q.19. Is there a need to introduce a special class of Infrastructure Providers to create, operate and maintain DCI for a building or cluster of buildings in ownership models suggested in response to Question No. 14? What should be the terms and conditions for

such special Infrastructure Providers? Should such terms and conditions vary depending upon type, size and usage of buildings? Please justify your response with rationale and suitable examples, if any.

Comments :   **Yes.**

Digital technologies have introduced profound changes to engineering design. For example, generative design tools, which automatically propose a range of design options in accordance with user-defined specifications, can radically reduce the time it takes to develop designs. The ability to examine and optimize a product of generative design is arguably becoming as important as the ability to conceive an original design. In addition, the uptake of modular construction methods has placed more importance on standardizing design elements and storing them in design libraries so they can be used over and over.

Applying these new techniques requires designers not only to learn technical skills but also to design in new ways. One with internal design functions should equip themselves with new technical skills—for example, by hiring developers to build standard libraries of design elements and automate certain parts of the design process. They should also start to adopt digital ways of working, shifting from a traditional, linear design process to a more agile approach that consists of faster iteration in short test-and-refine loops. Such a change requires that designers adopt a new mindset, using their experience to validate model results and to look for opportunities for standardization and repetition. This way of working will create capacity for designers to focus on more intellectually challenging

problems, such as reviewing and refining generative designs, for which engineering brainpower is irreplaceable.

Introduce rating of building from a DCI perspective- Voluntary scheme

Q.20. What are the initiatives or practices being taken in other jurisdictions outside India with regard to rating of buildings from a DCI perspective? Please share details and suggest how similar processes can be created in India?

Comments :

In UK Center for Digital Built Britain has set out Gemini Principles : A group of values, to aid the development of a National Digital Twin (NDT). A Digital twin is a virtual representation of an object or system that spans its life cycle, is updated from real time data, and uses simulation, machine learning and reasoning to help decision making.

The idea of a National Digital Twin means that 'federations' of individual digital twins will be joined together by securely shared data. By connecting digital twins across sectors, the infrastructure in their cities will benefit immensely. This doesn't mean that every single digital twin will be 'federated' though, this will only apply when it provides value.

An Information Management Framework will need to be adhered to by all participating organizations, but this can be done without their data being used as part of the NDT.

To guide the development of the NDT and IM Framework, nine values have been set out by the Centre for Digital Built Britain (CDBB). These values are known as the 'Gemini Principles.'

By setting out these values from the beginning of the process, it will make it a lot easier for the industry to share their information further down the line.

All asset owners and leaders across the built environment should take these principles into account when developing their digital twin.

The Gemini Principles:

Purpose
Public Good
Value Creation
Insight

Digital Twins must provide benefit to the general public, enable improvement in performance while creating value and must provide real insight into the built environment.

Trust
Security
Openness
Quality

Trust is a major part of the idea behind the National Digital Twin. A Digital Twin must enable security and be secure in itself, it must be as open as possible and transparent as possible and built using legitimately good quality data.

Function
Federation
Curation
Evolution

Finally, a Digital Twin must function effectively. A federation of digital twins must be based on a standard connected environment, there must be clear ownership of the twin, as well as clear governance and regulation. There is also a requirement for digital twins to adapt as the available technology continuously evolves.

The NDT will be a national resource for improving the performance, service and value delivered by the UK's infrastructure; delivering benefits to society, business, the environment, and the economy. CDBB has been tasked with delivering the information management framework to underpin the NDT, and a series of pilot digital twins. The framework forms an integral part of HM Government's modern Industrial Strategy and Construction Sector Deal.

Digital Framework Task Group

The Centre for Digital Built Britain's Digital Framework Task Group (DFTG) was launched by HM Treasury in July 2018. It reports to HM Government through the CDBB Strategic Advisory Board. The overarching purpose of the DFTG is to steer and guide the successful development and adoption of the "Information Management Framework for the Built Environment".

The creation of the framework forms an integral part of HM Government's modern Industrial Strategy and Construction Sector Deal. The framework will establish the building blocks to enable effective information management across the built environment and will pave the way for the development of the national digital twin.

Q.21. Is there a need to introduce Rating of buildings from the perspective of DCI that may help in nudging the Property Managers to strive for collaboration with other stakeholders to meet the digital connectivity expectations of the users of the building? Please justify your response with rationale and suitable examples, if any.

Comments :   No.

Rating should be simplified.

Q.22. In case, rating is introduced as a voluntary scheme, is there a need to monitor the progress? If progress is not satisfactory, would there be a need to launch campaigns and awareness drive to encourage Property Managers to come forward for rating? Please justify your response with rationale and suitable examples, if any.

Comments :   Yes.

If progress is not satisfactory, awareness campaign should be launched to encourage the property manager to come forward for rating.

Q.23. Should the voluntary scheme of rating be extended to cover cities, towns and villages and even states? Would such a scheme help in encouraging local and state authorities to facilitate TSPs in creation or in improving outdoor as well as indoor DCI? Please justify your response with rationale and suitable examples, if any.

Comments :   Yes.

Digitization and Awareness is needed.

Q.24. If in response to the Question No. 23 answer is yes then what framework should be introduced to rate cities, towns, villages and states, and how weightages can be assigned to different aspects of indoor and outdoor connectivity? Please justify your response with rationale and suitable examples, if any.

Comments :   Mentioned above.

Rating as a mandatory requirement for specific classes of buildings

Q.25. Is there a need to make rating a mandatory requirement for specific classes of buildings such as public transport hubs, government buildings or any building of public importance etc.? If yes, which type of buildings should be covered under this

category? Please justify your response with rationale and suitable examples, if any.

Comments : Yes.

Type of Buildings :

This can be implemented in the following building types:

1.   Villa complexes,

2.   Residential towers and groups of residential towers,

3.   Commercial towers and groups of commercial towers,

4.   Shopping malls,

5.   Groups of shops and retail outlets,

6.   Hospitals, hotels and other bulk service applications and

7.   Warehouses and sheds.

8.   Airports

9.   Public places

Note –   1.   New rating should not be implemented in private buildings.

2.   However the above-mentioned buildings types should not be limited.

1.   To achieve digital transformation, policy and regulation should be more holistic.

2.   Policy and Regulation should be evidence based

3.   Policy and Regulation should be outcome based.

4. Policy and Regulation should be incentive based.

5. Policy and Regulation should be adaptive, balanced and fit for purpose

6. Policy and Regulation should building trust and engagement.

Q.26. What should be the time plan to rate buildings falling under the mandatory category and is there a need to prioritize some buildings within the mandatory category to make it more effective? Whether existing buildings falling under such classes are required to be dealt differently? Please justify your response with rationale and suitable examples, if any.

Comments :

It should be think with sympathy because :

1. The typical construction project involves a multitude of independent subcontractors and suppliers, which have little incentive to embrace new methods during the brief periods when they are on the job. Projects vary greatly, so E&C companies often struggle to develop tools and methods they can apply repeatedly.

2. Limited R&D budgets prevent E&C businesses from spending as much on digital as companies in other sectors do.

3. Construction work often takes place in remote, harsh environments that are not well suited to hardware and software developed for the office. It is no wonder, then, that many E&C businesses end up with little to show for their technology investments.

4. It should be at the time of completion within one year with a simple and transparent method.

5. Existing buildings falling under such classes should be dealt differently.

Q.27. Is there a need to designate a nodal official for building(s) falling under the mandatory category to comply with the rating related requirements? What actions are proposed to be taken in case of non-compliance? Please justify your response with rationale and suitable examples, if any.

Comments :

1. Special agencies should be deployed to undertake inspection in the buildings for the digital connectivity rating and then award certificates.

2. Nodal officer should support for the rating related requirements.

3. No penalty or action should be taken.

4. More time should be given for the compliance.

5. Simplification and transparency will make it popular and acceptable for all.

Changes required in laws dealing with the development of areas or construction of buildings

Q.28. Is there a need to amend legal provisions under various laws, bye laws dealing with development of land and buildings or areas including forest areas, cantonment areas, port areas, panchayat areas, municipal areas etc. to facilitate creation of DCI and ratings of the buildings or areas? Please justify your response with rationale and suitable examples, if any.

Comments : **Yes.**

There should be a National Digital Infrastructure Commission (DGIC) bringing together key voices from Government, CAG's and Industry to provide the sector with foundation definitions and values to guide the development of the DCI and National Digital Program. This work should form part of National Digital Program's remit as the National focus for the digital transformation of the built environment.

The National Digital Infrastructure Commission should be a National resource for improving the performance, service and value delivered by the Indian infrastructure, delivering benefits to society, business, the environment and the economy. The framework should form an integral part of TRAI and Government's modern industrial strategy and construction sector.

Role of Regulator in New ecosystem

Q.29. In case a voluntary scheme for rating is to be introduced or rating is notified as mandatory for specific classes of buildings then what should be the role of TRAI or DoT? Please justify your response with rationale and suitable examples, if any.

Comments:

The TRAI should monitor the quality of telecom services by conducting detailed studies and issuing suitable directions towards improving the service quality.

The TRAI, should enable environment for the creation of an ecosystem in designing, implementing, operating, maintaining and expanding connectivity through upgradations to meet future challenges of digital connectivity inside buildings and areas.

Q.30. Whether creation of "Regulatory Sandbox'' to carry out experiments or demonstrate capabilities of innovative solutions to improve digital connectivity would be helpful to make changes in existing policies, laws or regulations? What should be the terms and conditions to establish a regulatory sandbox? Please justify your response with rationale and suitable examples, if any.

Comments :   **Yes.**

- ➢ Regulatory Sandbox may open space for improvement in capacity of innovative solutions to improve digital connectivity by helping to make changes in existing policies, Laws or Regulations.

- This is important because the success of Digital Connectivity largely hinges on the capacity of the Telecom Sector to innovate. Innovations can address traditional barriers to DCI and Digital Transformation such as Legal, Operational and Physical. Regulatory sandboxes may also encourage competition and co-operation between incumbents and challengers to the benefit of excluded and undeserved customers.
- Regulatory sandboxes may strengthen the capacity of regulators by more open and active dialogue.

Criteria :

    (i)   Target Companies

    (ii)   The Products and Services considered in Regulatory Sandbox

    (iii)   The Technology Considered

Eligibility and restrictions :

Services similar to those that are already being offered.

Regulatory Requirement and Relaxation for Applications :

- It should be on case-to-case basis like :

    (i)   Liquidity requirement

    (ii)   Management Experience

    (iii)   Financial soundness   etc..

- Applicants must mandatorily furnish proof of customer privacy, data protection etc..

Testing period :

The cohort may run for varying periods, but should ideally be completed within six months.

At the end of the sandbox period, the regulatory relaxations provided to the entities will expire, and the sandbox entity must exit the RS. If the entity requires an extension of the sandbox period, it should apply to the RBI at least one month before the expiration, and furnish valid reasons to support the extension application.

Operationalization of rating framework

Q.31. Is there a need to establish a Certificate Issuing Authority to award ratings to buildings from DCI perspective? If yes, what should be the structure of such an authority? If not, who can be assigned the role to perform this function? Please justify your response with rationale and suitable examples, if any.

Comments :   Yes.

The Certificate Authority acts as a trusted third party – trusted by both the owner of the certificate and by the third party relying upon the certificate.

A Two tire structure can be applied. One should be at root level i.e. off line and a subordinate issuing Certificate issuing Authority online. The level of security will increase because the Root level - offline CA and the issuing CA role are separate. There can be multiple issuing CA's that are subordinate to the Root – Offline CA. This allows to have CA's in different geographical locations as well as different security levels.

1.   There should be standard methodology.

2.   There should be validation of standards.

3.   Submission of design drawings and documents by building owners should be mandatory prerequisite.

Q.32. Whether the authority suggested in response to Question no. 31 may use reports from DCI evaluators to award ratings? To ensure reliability of reports from DCI Evaluators, should Certificate Issuing Authority need to conduct periodic audits of DCI evaluators? Please justify your response with rationale and suitable examples, if any.

Comments :   Yes.   It must be.

Report can be carried out in following phages :

1.   Scrutiny of Data and Design received from owner.

2.   Visual inspections and verification at the premises.

3.   Analysis of Data Record.

4.   Report Preparation.

Following can be verified at engineering office :

1.   Structural plans and details

2.   Presence of critical structures and structure without redundancies.

3.   Compliance to different code provisions in design

4.   Adequacy and stability of structure with regards to operation.

5.   Exposure to aggressive environment

6.   Maintenance protocols

7.   Safety protocols

5 yearly audits of DCI evaluators should be conducted.

Terms and conditions for using awarded ratings including provisions for its renewal, revocation & penal provisions in case of misuse

Q.33. What should be the terms and conditions for using ratings awarded to a building(s) from a DCI perspective? What should be the validity period of awarded ratings? Do you envisage any situations under which an awardee of ratings might be required to get the ratings renewed before the validity period? Please justify your response with rationale and suitable examples, if any.

Comments :   Mentioned above.

Validity period should be five years. After five year the validity period should be renewed.

Q.34. Whether in the initial stages of introduction of the rating system, validity should be for a shorter time period, and later it may be increased as evaluation system matures? Should the validity period be dependent on the type of buildings? Please justify your response with rationale and suitable examples, if any.

Comments :

Validity period should not be for the shorter time period as it is difficult and costly to update the technology in a shorter period.

It should not be dependent on the type of buildings as the technology will be the same.

Q.35. Whether the process of renewal of rating should be the same as the process defined to get rated first time or it may be incremental? Or renewal process may be dependent upon the grounds on which it is being renewed e.g. expiry of validity period, introduction of new technology, introduction of new spectrum band(s), introduction of new services(s) etc.? Please justify your response with rationale and suitable examples, if any.

Comments :   No.

1.   It should be simple and transparent.

2.   Implementation of new technology, spectrum etc. is the responsibility of the service provider.

Q.36. Whether the provisions to make an appeal should be introduced to give an opportunity to the applicant to make representation against the decisions of the Certificate Issuing Authority? What should be the time frame for preferring the appeal in case of

disagreement with the rating assigned and its disposal? Please justify your response with rationale and suitable examples, if any.

Comments :

1. **More and more clauses will complicate the matter and create harassment for the building owners and service providers.**

2. **It will difficult to implement**

3. **Corruption will increase.**

Q.37. If somebody is found to be using ratings in an unauthorized manner, what legal actions are proposed to be taken against such entities? Please justify your response with rationale and suitable examples, if any.

Comments :

There are several laws for forgery and cheating.

Section 465 of the Indian Penal Code describes Punishment for forgery. According to this section, Whoever commits forgery shall be punished with imprisonment of jail term either description for a span which may extend to two years or with the penalty, or with both. Under IPC it is a non-cognizable offence.

Cheating is defined under **Section 415** of the Indian Penal Code as whoever fraudulently or dishonestly deceives a person in order to induce

that person to deliver a property to any person or to consent to retain any property. If a person intentionally induces a person to do or omit to do any act which he would not have done if he was not deceived to do so and the act has caused harm to that person in body, mind, reputation or property, then the person who fraudulently, dishonestly or intentionally induced the other person is said to cheat. Any dishonest concealment of facts which can deceive a person to do an act which he would not have done otherwise is also cheating within the meaning of this section.

Adoption of Digital Tools & Platforms, AI/ML Models to co-design and co-create DCI

Q.38. Whether creation of a digital platform that allows stakeholders to co-design and co-create DCI would be helpful to realize better, faster and cheaper solutions? Whether technologies and tools such as AI, ML would be helpful in achieving this objective? Please justify your response with rationale and suitable examples, if any.

Comments : **Yes.**

Typical processes involved in rating of a building

Q.39. What should be the typical process to rate a building? Whether terminologies and steps involved in the rating process need to be standardized? Please justify your response with rationale and suitable examples, if any.

Comments :   **Mentioned aove.**

The terminology and steps involved in the rating process should be standardize.

Q.40. Whether the process of rating would vary based on the types of buildings? If yes, then what factors or aspects of a building would matter or impact the outcome of rating? Please justify your response with rationale and suitable examples, if any.

Comments :   **No.**   **Mentioned above.**

Q.41. Which objective methods should be used to evaluate the DCI? How can various aspects of performance to evaluate the quality can be combined together? Please justify your response with rationale and suitable examples, if any.

Comments :   **No Comments.**

Q.42. Which subjective methods should be used to evaluate perceived quality of DCI? Whether survey techniques can be improved considering penetration of smartphones? Whether improved techniques can help in providing insights and actionable items to improve DCI? Please justify your response with rationale and suitable examples, if any.

Comments :   **No Comments.**

Q.43. Would combining the parametric values or results of objective and subjective methods be helpful in assessing digital connectivity that is closer to the perceived quality of experience? Please justify your response with rationale and suitable examples, if any.

Comments :   No Comments.

Q.44. How advanced technologies such as Artificial Intelligence (AI), Machine Learning (ML) etc. might be useful to make the evaluation process more nuanced and suitable for the purpose? How can AI/ML models evolve from the inputs of measurement and evaluation being carried out in other parts of the city, state or Country? Please justify your response with rationale and suitable examples, if any.

Comments :   Mentioned Above.

Q.45. Any other issue which is relevant to this subject? Please justify your response with rationale and suitable examples, if any.

Comments :   No.

Thanks.

Yours faithfully,

(Dr. Kashyapnath)
President
Member Organization : TRAI