

**CONSUMER PROTECTION ASSOCIATION  
HIMMATNAGAR  
DIST. : SABARKANTHA  
GUJARAT**



***Comments  
On***

***Regulatory Framework for Promoting Data Economy Through  
Establishment of Data Centers, Content Delivery Networks, and  
Interconnect Exchanges in India***

**Introduction :**

The explosive growth in data and the availability of computing resources have introduced unprecedented complexity in the data center environment. The past 20 months have pushed the enterprises further and faster into the future. It has brought about dramatic changes in the way businesses operate. Agility and business efficiency have taken center stage. It underlines the fact that business efficiency is and will remain a long term mandate for organizations in their pursuit of growth and profitability. As this shift becomes more pronounced, most of the data center environments grow more complex rather than more efficient.

The demand for data centers in India is at its peak due to factors relating to growing data generated by individuals, adoption of Cloud Computing by businesses, and expanding internet penetration. The advancing Indian economy is offering opportunities to private organizations and IT service providers to invest in building datacenters in India and serve the storage-hungry national initiatives and citizens. According to various market research firms, they have estimated the growth of India's datacenter market size at USD 4.4 Billion in 2020 that is expected to reach at 8 Billion by 2026, meaning growth be at a CAGR of 12%.

The digitalization initiatives by the Government of India has also brought a great shift in adoption of datacenter services as Indians are now utilizing e-Governance services that are generating more citizen-centric data leading to increased and safe storage requirements.

India has seen a sea change in its technological landscape in the last five years, the country making fast-paced progress towards a full-fledged digital economy. Much of it could be attributed to the surge in internet connectivity and mobile phone penetration in the country. Digital payment options today are a preferred mode of transaction and a large share of the population is now actively engaging on a varied range of social media platforms and e-commerce sites.

Today, even small, and medium-sized businesses are looking to transform into technology-led businesses with a shift towards increased cloud-led innovation and are seeking their own data centers. Not surprisingly, the demand for hyper scale data centers and managed services has increased considerably in the past two years.

Although the pandemic has disrupted business operations in 2020, the data Centers (DC) market has managed to make gains from the accelerated shift towards digital. Even before the outbreak, the rise of digitalization and cloud computing had been leading to a steady rise in India's DC industry.

### **Gathering Momentum**

COVID-19 has fueled the use of digital services and boosted the demand for datacenter services across India. Since the pandemic began, many organizations have digitalized their processes and adopted datacenter & Cloud services, while the existing datacenter service providers in India were able to provide efficient and secure services. As days goes by, the demand and usage for data storage is growing as people work remotely and generate huge amounts of data. India is witnessing increased need for more datacenter facilities across multiple locations so that the users receive appropriate application hosting and data storage services.

The corona virus outbreak, however, led to dual pressures on the industry. On one hand, demand from enterprises weakened initially due to the nationwide lockdown.

On the other, the switch to remote working and the work-from-home regime sparked a sudden surge in individual demand. Moreover, academic institutions embraced online classes to surmount social distancing strictures. Collectively, these measures offset the dip in institutional demand.

Simultaneously, companies with captive data centers sought to limit operational expenses and curb the risk of maintenance and allied outgoings. Others lacking captive DCs were keen on avoiding the high upfront costs it entails such as steep real estate or leasing costs, high power tariffs, complexities related to security, safety and maintenance, etc.

All of these nudged enterprises into moving towards collocation and cloud service providers. The largest users of collocation facilities include IT & ITeS, telecom and BFSI, among others.

It's not now about what is driving data center growth in India. It is how we can even make the data storing technology solid and secured in the future. The future of the data center in India should be such that it takes care of all the cooling needs and fight all the challenges of the past.

In the future, data is going to explode even more and which will further increase the demand for storage capacities. Although there has been seen an escalated data center growth. But there will be needing to expand the data center services. Already the size of data centers has expanded unexpectedly from the size of a room to big towers.

Energy consumption in data centers is growing rapidly. Combined with growth in the IT industry and rising energy prices, energy consumption adds a significant burden on the operating costs. The exponential growth of software and services businesses indicate that the energy challenges to the data center industry and opportunities for energy efficiency need greater attention.

## ISSUES FOR CONSULTATION

**Q.1: What are the growth prospects for Data Centres in India? What are the economic/financial/infrastructure/other challenges being faced for setting up a Data Centre business in the country?**

### **Comments :**

With more than 14 data center investments in India from January to September 2020, the Indian data center industry is expected to witness immense growth. As a matter of fact, this industry has been growing at three times the global rate. There are numerous statistics that prove the exponential rise of the data centers in India.

1. Increased Data Usage Even before the pandemic crisis, India was projected to be the second-largest digital economy by McKinsey – with the IT/ Communications sector set to double by the year 2025.

As per McKinsey, India is the world's second-fastest-growing digital economy. Going by projections, by 2025 the IT and communications industry will double in size, contributing \$355-435 billion to India's GDP.

2. It's no surprise that a Crisil report states the sector's capacity will jump threefold by FY2025, reaching 1,100–1,200 MW from the current 360 MW. These estimates take into account the \$4–5 billion in investments declared during the past three years for expanding both brown field and green field projects. The Crisil report notes that data consumption witnessed a sharp rise of 38% y-o-y in the first quarter of FY2021.
3. According to the market estimates, the Indian CDN market was evaluated to USD 435.2 million in year 2018 and is expected to reach USD 2,846 million by 2027. Data center India are growing at a compounded annual growth rate of approximately 19.9% per annum with BFSI (Banking and Financial Institutions) and manufacturing sectors indicating the highest deployment.
4. The size of the digital economy in India is estimated to grow from \$ 200 billion in 2017-18 to a staggering \$ 1 trillion by 2025.
5. With over a billion mobile phones and more than 700 million internet subscribers, India has also witnessed an exponential growth in digital-commerce, digital entertainment and use of social media. India's mobile data consumption is already the highest in the world and is constantly increasing.

6. The size of the digital population in India and the growth trajectory of digital economy necessitates a strong growth of Data Centres, which has the potential to fulfill the growing demands of the country. Indian Data Centre market has seen tremendous growth in the past decade, riding on the explosion of data through smart phones, social networking sites, ecommerce, digital entertainment, digital education, digital payments and many other digital businesses / services. This growth in data is further stimulated by adoption of emerging technologies such as quantum computing, artificial intelligence, internet of things etc. This has been supported by various efforts of government in forms of various enablement for the sector.
7. Need for Data Centre infrastructure within the boundaries of the country is further necessitated by the data localization provisions of proposed Data Protection Act and for protection of the digital sovereignty of the country in an increasingly connected world. India also offers advantages of having a favourable geographical location on the world map, availability of economic resources, established global connectivity through submarine cables, easy and cost-effective access power and readily available skilled manpower provides, enabling the nation to become a global Data Centre hub.



## **The Expansion and Growth of Indian Data Centers :**

1. Multiple drivers, including the new data localization norms, are propelling the rising need for data centers. The trend will continue well into 2022 and beyond.
2. Government initiatives like Digital India, National e-Governance Plan, and e-Visa are expected to grow data usage in the country – thus boosting the demand for data centers.
3. Apart from the presence of these hyper-scaling companies in the country, favorable factors like high data bandwidth, growing domestic market, and cheap power are also driving the data center industry.
4. Adoption of Advanced Technologies  
Another key factor is the increasing adoption of data-centric technologies like Big Data, Cloud Computing, and the Internet-of-Things (or IoT).
5. Apart from these, technologies like Artificial Intelligence and Machine Learning are being used for data analytics. Data centers – with their advanced IT infrastructure and computational power – are now a vital cog in implementing these cutting-edge technologies.

## **6. Global Companies setting up base in India :**

### **(i) Increased data demands from global companies in India**

From the year 2019, Indian real estate and infrastructure

companies like Adani Group and Yotta Infrastructure announced their plan to set up data centers to meet the demands of global companies like AWS, Microsoft, and Google.

- (ii) Over the last few years, global players like Fujitsu, IBM, and Schneider Electric have set up their base and have an active foray in the data center industry. Other private companies like Digital Realty and Adani Group are also partnering and investing in data centers across the country.
7. Going forward, the data center industry will witness the growing presence of global companies through either partnerships or acquisitions in the Indian market. This will make India a key communication hub for data-related activities at a global level.
  8. Given the growing demand, even the major cloud service providers have been probing the options of creating data centers. Behemoths in other verticals are also realizing the importance of data centers. According to recent media reports, Amazon is investing \$2.8 billion for building its second DC in the country.
  9. Between captive DCs and third party or outsourced ones, the latter are poised to gain greater momentum because of scale economies. Presently, cities such as Mumbai, Bengaluru,

Chennai, Hyderabad, Pune and Delhi-NCR are among those where the industry is making its presence felt.

10. The rising growth of data center facilities in India is driven by factors like increasing **availability of high bandwidth speed, power and energy savings, state-of-the-art infrastructure, and cutting edge technology used by the service providers and the growing presence of hyper scalars.** These factors are steadily maximizing a company's business value while reducing its variable costs for India's DC players.
11. The trend towards DCs is apparent from private equity and strategic investments' exponential growth of about \$396 million between January and September 2020. An ANAROCK-Mace report reveals this comprises around 40% of the entire investments since 2008.
12. The sudden spike is credited to India's data localization policy that has cleared the road for hyper-scalar DCs in managing increasing data consumption.

### **Data drives Demand**

13. That apart, there are additional indicators about why DCs are poised for a boom in 2021 and beyond. A JLL report – Investors (re)imagining India data centre market – noted that the country's DC market will outperform in the coming five years. The growth would be driven by the burgeoning digital

economy, increasing investor interest and stable returns in the long run.

14. Users' data consumption habits offer another indication of the growth potential. While Indians only consumed 0.3 GB per month in 2014, this figure is now 10 GB. By 2025, the total data traffic is expected to touch 21 exabytes per month. Much of the soaring data consumption is ascribed to social media, fuelled by the escalating use of smart devices and low Internet rates.
15. Other factors include the preference of housebound audiences for OTT (over-the-top) platforms, accelerating online sales and the government's encouragement of Digital India and online transactions.
16. Meanwhile, the Centre recently released its draft Data Centre Policy 2020 to ensure sustainable DC capacity in meeting India's tremendous data demand. Some prospective but critical steps that could create an enabling environment for DCs: uninterrupted power supply; robust and cost-efficient connectivity backhaul; recognizing DCs as a distinct category of the National Building Code; declaring DCs an essential service under ESMA (The Essential Services Maintenance Act, 1968) and building special Data Centre Economic Zones.

17. Market analysts believe if these and additional measures are implemented, it can attract national and international investments while giving a fillip to industry research too. As things stand, DC players expect revenues to record a 20% year-on-year growth in FY2021.
18. Additionally, improved infrastructure in non-metros will make these regions more attractive for some hyper-scalars in setting up DCs there. Presently, the top seven cities are said to account for 75% of India's total DCs. The likely launch of 5G technology in future will also accelerate faster adoption of IoT-enabled devices driven by big data requirements.
19. There is no doubt the pandemic has triggered an inexorable move towards cloud services. As a result, security and scalability via DCs will now be the predominant trends in 2022 and thereafter.
20. Consequently, with the rapid advancements in information technology, companies engaged in the technology industry have established their global presence. These enterprises are known for providing best-in-class services by using cutting-edge technology, overshadowing other nations while immensely contributing to the country's overall growth.
21. One of the underlying factors that have resulted in a fundamental transformation in the country's data center

architecture is essentially driven by virtualization and cloud computing. The technology is creating significant opportunities for enterprises offering Ethernet equipment to data center facilities.

22. According to industry experts, the adoption of new management and engagement models, including the pay-per-use utility model and collocation services are acting as a catalyst for driving the growth of data center facilities in India. By availing of these solutions, companies have previously known to benefit from cost savings while achieving high returns on investment from cloud computing and virtualization.
23. The mushrooming of data centers in India can also be attributed to the rise in internet penetration coupled with the advancements in cloud computing, **cloud hosting**, Internet of Things (IoT) and Artificial Intelligence (AI).
24. India being the hub of IT activities, the increasing IT business process outsource from foreign countries has resulted in phenomenal growth of Datacenters in India.

### **Challenges :**

While the Data Centre sector is witnessing growth in the country, there are known impediments to its growth such as lack of infrastructure or Industry status of the Data Centres, complex clearance processes, time consuming approvals, high cost of power,

lack of published standards, absence of specialized building norms for building the Data Centres, submarine cable network connectivity limited to few states and high cost of capital and operational expenditure etc. The policies should be aims to offset these challenges in order to accelerate the current pace of growth and propel India in becoming a global Data Centre hub

Focus Area	Challenges
Expertise and Awareness	<ul style="list-style-type: none"> <li>• Lack of expertise, little or no retrofit industry, and knowledge/advice is fragmented.</li> <li>• Efficiency not on “high priority” list.</li> <li>• Continued lack of focused forums on data center facilities and especially efficiency opportunities.</li> <li>• More experts needed (consultants) and a way to “qualify” those experts.</li> <li>• More awareness needed (but significant improvement – “green” overall) to identify:               <ol style="list-style-type: none"> <li>a. What is the problem?</li> <li>b. What are the solutions?</li> <li>c. Need to convert above to commitment (to change)</li> <li>d. Big enterprises are making progress but next tier lacks basic information.</li> </ol> </li> </ul>
Regulation and Policies	<ul style="list-style-type: none"> <li>• Hard to focus on without specific guidance.</li> <li>• Difficult to “sell” to management (e.g. payback) without effective regulations/guidance, partly because downtime is so much more costly.</li> <li>• Large organizations have significant momentum, difficult to change course without larger mandates (e.g., sustainability, carbon emissions).</li> </ul>

	<ul style="list-style-type: none"> <li>• Data centers fall through crack between buildings and industrygovernment programs.</li> </ul>
Design Requirements and Standards	<ul style="list-style-type: none"> <li>• Indian data centers may not involve expert consultants in design(vendors fill the gap).</li> <li>• Difficult to define design requirements early in project (includingprojecting growth).</li> <li>• Need for real data on load and need to have modular design toaccommodate changes.</li> <li>• Misalignment of design and operation.</li> <li>• Capacity underutilization of some facilities (designed for highercapacity).</li> <li>• Lack of design standards (voluntary and mandatory).</li> </ul>
Information Technology(IT) and Infrastructure	<ul style="list-style-type: none"> <li>• Optimized environmental limits of server operation not clear orwell defined .</li> <li>• Large growth expected (e.g. 60-70%), need for infrastructure consolidation rather than random growth. Existing infrastructurelimits (capacity constraints).</li> <li>• Need designs for flexibility of higher density loads (e.g. blades)</li> <li>• Virtualization technologies are not “here” but coming and willimpact facility energy use significantly.</li> </ul>
Performance Metrics	<ul style="list-style-type: none"> <li>• No measurement and verification including “base lining” to determine opportunities and actual performance.</li> <li>• Data not being converted to information.</li> <li>• No feedback on utilization rates. Designers don’t go back and check.</li> <li>• Difficult to keep up, efficiency is low priority and often done late.Need service-level metric</li> </ul>



	<p>for efficiency.</p> <ul style="list-style-type: none"> <li>• Little good data from manufacturers regarding temperature requirements, actual power draw, etc.</li> <li>• Manufacturer representatives quote tighter ranges than specification sheets or ASHRAE ranges.</li> <li>• Difficult to determine PUE (lack of sub-metering).</li> </ul>
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There are, several issues that need to be resolved before we truly embark on a growth trajectory for the data centre industry. Some of the key challenges currently constraining the data centre growth in India are:

**1.** The competitive realm along with heavily segmented market divisions is creating a difficult environment for service providers to sustain their presence.

**2.** Most of the equipment providers are coping up with the challenges, which are further multiplied by factors like technical complexities, various migration options available, a wide number of standards defined by numerous bodies. There are also different baselines like changes in technology, which are further setting hurdles to the current ecosystem.

**3.** Despite the above factors, surging energy costs, dwindling organizational budgets, adoption of diverse servers in data centers,

and increasing preference for process outsourcing are further paving the way for vendors to expand their presence across the country. Some of the data center services like VPS hosting, dedicated server hosting, and cloud hosting are burgeoning at a rapid pace.

**4. Connectivity** : The rapid increase in hyper-scale data companies and online consumers also means that connectivity is a key challenge for data centers in India. The advent of the 5G Internet technology in 2021 is likely to boost the adoption of IoT devices – and will be essential for data center investments in the country.

Adversely, poor connectivity could translate into poor revenues, lack of investments, and the inability to cope with increasing data demands.

**5. Carbon emissions** : When it is a matter of growing power consumption, the data center industry will be under focus for its carbon emissions or footprint. Global data centers are already facing scrutiny for their carbon footprint.

**6.** Unfortunately, the data centers in India have failed to keep pace with the burgeoning demand for data storage, processing and management. Their inability to operate at optimal efficiency hampers the quality of their service and also wastes precious resources.

## **7. Ineffective Monitoring of Assets**

(i) A data center houses several assets: applications, connecting cables, storage units, cooling systems and so on. With so many complex systems working simultaneously, it becomes cumbersome for data center managers and operators to monitor and report the key performance metrics in near real-time.

(ii) Real-time metrics offer insights into data center operations allowing the personnel to act immediately and take well-informed decisions.

(iii) In the absence of real-time reporting, data center operators take manual readings. A manual reading taken a few days back does not hold much relevance for a data center where workload, consumption and temperature fluctuate widely every couple of hours.

## **8. Excessive Energy Consumption**

Data centers have constantly been under the scanner for being energy hogs. Data centers by design consume a vast amount of energy in a wasteful manner. According to an estimation, data centers waste nearly 90% of the electricity they pull off the grid.

Worldwide, data centers consume 2% of the electricity produced and emit as much carbon dioxide as the airline industry. With data traffic doubling every four years, the situation can reach unmanageable levels soon. Data centers need to implement drastic

measures to bring down energy consumption to acceptable levels and do their bit in reducing carbon footprint.

## **9. Power availability :**

Power availability – around the clock – is an absolute must for smooth data center operations. Even though India has been successful in improving its available power, the challenge would be sustaining it against the growing market demands.

There is also the need for ample infrastructure to be in place. Fibre network and power requirement are key components of a data centre. Most cities have a single power service provider with no alternate sources of power. Unstable power supply and heavy reliance on generators is a major operational task for operators.

Apart from coal-generated power, the country has increased its solar power output – which also needs to be integrated with the national power grid to ensure continuous power supply for data centers and consumers.

## **10. Inefficient Capacity Planning**

Most data centers in India have no system to determine if their assets are running at full capacity. Data center managers tend to over-provision resources in order to avoid any delay or unscheduled downtime. While such an approach does ensure a higher uptime and availability, it also leads to wastage of a significant amount of resources in the form of unused space, electricity and cooling power.

## **11. Poor Staff Productivity**

In many data centers, manual reporting systems are used. These systems require the staff to spend a great deal of time logging activities into spreadsheets. Such tasks hamper the productivity of data center operators and prevent them from focusing on other vital aspects of data center management.

Replacing traditionally used manual systems with automated systems can help data center personnel work with higher efficiency. They can spend time on strategic decision-making and improving their offerings.

**12. Dearth of required skill set** – At present, India is hampered greatly by a shortage of skilled labour, that is essential for a successful data centre. This includes skills in specialized areas such as power, HVAC, security, network and civil for power systems, facilities control and robotics, amongst others, technology skills such as programming and familiarity with certain technology platforms and tools. Additionally, problem-solving skills and critical thinking with a high priority on efficiency are also much required.

## **13. Long Recovery Periods**

Most of the data centers in India do not have requisite tools to get information on how the assets in a network are connected and where these assets are located. As a result, whenever there is a downtime, the data center operators take a lot of time in identifying

and fixing problems. Such long recovery periods can be detrimental to the long-term growth of data centers.

**14. Paucity of adequate infrastructure**—Scarcity of resources such as water to cool the facilities leads to high ambient temperature and power usage effectiveness below the required level. Besides, India's current fixed broadband speed is relatively lower than global average and is an impediment to efficient data centre operations.

**15. Location and land constraints** –Development of a data centre is different from other real estate asset classes. It requires keeping in mind the city dynamics and its GDP, adequate power infrastructure, land availability devoid of any drawbacks, access roads, viability of establishing cable routes, availability of water resources, skilled manpower and other factors like seismic activities, flood records, flight paths, distance from transportation hubs, proximity to establishments like residential areas. Thus, it is a difficult task to access land banks in cities with these particular set of requirements.

**16. Capital intensive** – Data centres are capital intensive, and this comes across as a strong barrier of entry for many developers and investors alike. Prevalent norms for commercial buildings that are applied to data centres lead to wastage of space and increased cost. Besides, factors such as high real estate cost, expenses on improving wide area network connectivity and increased cost of equipment owing to the ongoing pandemic have also resulted in augmenting the already heavy capex in the sector.

## **Q.2: What measures are required for accelerating growth of Data Centers in India?**

### **Comments :**

2.1 The Policy should be aims at creating a favourable climate for investments in the Data Centre Sector, both domestic investments and Foreign Direct Investments, and incentivizing the growth of a robust and sustainable Data Centre sector in the country.

2.2 The Indian datacenter market is tough for foreign IT service providers to tap because of the datacenter policies and Data Localizations laws of our nation and each Indian state.

2.3 The Government can collaborate and invest in the Indigenous datacenter providers to set up localized datacenters. Building one is rewarding due to the opportunities the Indian market has to offer. Datacenters offer multiple services ranging from Collocation services to hosting enterprise applications, which serves a huge amount of audience and caters to the digital needs of businesses and individuals.

2.4 **Policy needs** – One of the most significant issues confronting the data center sector is a lack of appropriate policies to enable its expansion. With powerful governments at the state and central levels, there are a variety of restraints for data center operators in

terms of policies, approval processes, taxation, and other laws and regulations.

2.5 Stable policies between state and central governments are necessary for data centers in order to expedite approval procedures and shorten delays. Consolidated efforts are also required on multiple fronts, including the construction of single-window clearances, uninterrupted power at cheap prices, 5G deployment, financial incentives, effective tax structures, and stamp duty exemption on property purchase, among others.

2.6 Data centers differ from commercial buildings in that they must adhere to a separate set of standards. As a result, the government must develop long-term strategies to meet such demands. The Ministry of Electronics and Information Technology recently released a draft policy framework for the intervention/promotion of data centers in India. It is predicted that once the ideas are adopted, many of the concerns impeding data center expansion would be remedied.

2.7 **Capital intensive** – Data centers are capital expensive, considerably more so than any commercial building, and thus presents a significant barrier to entry for many developers and investors. Common commercial construction standards that are applied to data centers waste space and raise costs. Furthermore, issues such as high real estate costs, spending for expanding wide



area network connections, and higher equipment costs due to the ongoing pandemic have all contributed to the sector's already high CAPEX.

2.8 States should be encouraged to demarcate specific zones (land parcels) for setting up Data Centre parks with necessary infrastructure like road connectivity, availability of water and other essential infrastructure items.

2.9 Promote pre-provisioned Data Centre parks, to enable 'plug and play' model for Data Centre providers, by provisioning access to:

- i) Land
- ii) Power availability at low rates
- iii) High capacity network back-haul
- iv) Pre-approved clearances/ approvals

#### **2.10 Enabling a favorable ecosystem for the operations of Data Centers :**

For the long-term growth of the Data Centre sector in the country, it is necessary to create a congenial, competitive and sustainable operating environment for the businesses. Some of the key policy suggestions in this direction are :

2.10.1 Availability of uninterrupted, clean and cost-effective electricity for Data Centers remains as one of the most important considerations for the Data Centre sector. The key focus areas of the policy should be as follows:-

- 1.1 Facilitate provisioning of quality power for uninterrupted supply to Data Centers / Data Centre Parks.
- 1.2 Facilitate Data Centre Parks to setup own power generation units to ensure quality of power
- 1.3 Identify mechanisms to ascertain long term availability of electricity at reasonable rates
- 1.4 Enable effective open access system to allow Data Centre service providers directly procure power from generation companies (including renewable power generation units)
- 1.5 Encourage use of renewable energy for Data Centers – solar or wind based power – by collaborating with Ministry of Power on their various green and sustainable energy initiatives.
- 1.6 Encourage efficient utilization of energy by promoting innovative techniques and solutions for energy management for reducing the carbon footprint of the Data Centers.

1.7 Formation of Steering group, comprising of representatives from TRAI, DoT, Ministry of Power, Ministry of Electronics and Information Technology and State Governments to identify the execution mechanism for the identified intervention related to availability of quality power.

2.10.2 TRAI should work with Department of Telecommunications (DoT) to facilitate robust and cost-effective connectivity backhaul :

2.1 Leverage the framework provided by National Digital Communications Policy 2018 (NDCP) to encourage and facilitate

i. Common service ducts and utility corridors for enabling proliferation of Optical Fiber Cables and dark fiber for the Data Centre operations and ensuring sharp reduction in downtime due to fiber cuts.

ii. Sharing of active infrastructure by enhancing the scope of Infrastructure Providers (IP) and promoting and incentivizing deployment of common sharable, passive as well as active, infrastructure (Ref: NDCP 2018).

2.2 Facilitate Data Centre providers to establish captive fiber networks, especially for connecting Data Centers, through

appropriate review and re-alignment of existing regulations and policies (Ref: NDCP 2018).

2.3 Enable and encourage Dial Before You Dig Policy (DBYDP) to allow easy access to information about the underlying network infrastructure before the commencement of digging.

2.4 Data Centers to be declared as an Essential Service. Continuous functioning of Data Centers is critical for continued delivery of services and to maintain the normalcy of day to day activities. Inclusion of Data Centre under Essential service will enable seamless continuity of services even during times of calamities or crisis.

2.10.3 Promote indigenous technology development, research and capacity building :

3.1 Promote local manufacturing

3.2 Promote and encourage use of indigenous hardware (IT as well as non-IT equipment) and software products used in the Data Centers, thereby reducing the overall import burden of the country.

3.3 Promote R&D in Data Centre ecosystem

3.4. Promote setting up of R&D units to create an ecosystem that will promote development of Data Centre components within the country.

3.5 Promote technology firms to produce innovative products and services for the Data Centre ecosystem and facilitate their commercialization for sustainable growth.

**Q.3: How Data Centre operators and global players can be incentivized for attracting potential investments in India?**

**Comments :**

**1. Providing Infrastructure Status to the Data Centre Sector :**

Data center sector should be provided “Infrastructure status”, at par with other sectors like Railways, Roadways and Power, bringing in the benefits of availing long-term credit from domestic and international lenders at easier terms. This will provide a boost to the investments in this sector.

**2.** Central and State Governments should formulate their respective schemes and guidelines detailing out fiscal and non-fiscal incentives in this sector to enable further expansion of Data Centres in the country.

**3. Formulation of Data Centre Incentives :**

3.1 A Data Centre Incentives should be formulated, which should specify the intended beneficiaries, applicability criteria and fiscal and non-fiscal incentives for the sector.

3.2 Incentives should also be provided on usage of domestic IT hardware including servers, storage, network devices, etc. and non-IT equipment such as mechanical, electrical, plumbing, cooling equipment etc.

#### **4. Setting-up of Data Centre Economic Zones**

4.1 The benefits, should be applicable for both private sector as well as public sector Data Centre Parks /Data Centre Developers and Data Centre Operators

4.2 Government should also set-up specialized Data zone with the most conducive non-IT and IT infrastructure, connectivity, power and regulatory environment which create an eco-system of Hyper scale Data Centres, Cloud Service Providers, IT companies, R&D units and other allied industries.

5. Incentivize global equipment manufacturers to set up manufacturing units of IT/ Non-IT components in India, catering not only to local demands but also for export purposes.

- 6.** Strengthen the testing and certification framework for the Data Centre ecosystem, including for the IT and non-IT equipment and software products pertaining to Data Centres operations.
- 7.** Encourage joint ventures between the foreign investors and domestic companies to promote participation from Indian companies, in the development of Data Centres. This would enable long-term capacity building of the domestic companies operating in this space
- 8.** Promote Adoption of Established Global Standards
- 9.** Publishing and mandating minimum standards for Data Centres / Data Centre Parks in the areas of build, IT, non-IT and security.
- 10.** Ministry should promote global adoption of services from state-of-the-art Data Centre infrastructure available in India, through various inter-governmental initiatives / MoUs.
- 11.** Improve international connectivity and cost of bandwidth, as per the guidance provided in NDCP 2018. Improved international connectivity will be a key driver for global players to consider India as a preferred destination for their Data Centre investments.

**12.** Extend fiscal incentives to domestic start-ups and MSMEs to develop solutions for Data Centre usage.

**Q.4: What initiatives, as compared to that of other Asia Pacific countries, are required to be undertaken in India for facilitating ease of doing business (EoDB) and promoting Data Centres?**

**Comments :**

4.1 Simplify clearances for setting up Data Centres in the country.

4.2 Rationalize the clearances required to set-up Data Centres/ Data Centre parks in the country.

4.3 Institutionalize processes for granting single window clearance, in a time bound manner by State Governments / UTs.

4.4 Publish list of approvals / clearances required for operationalization of Data Centres along with the defined timelines for obtaining the same, in collaboration with State Governments / UTs.

**4.5 Enable Ease of Doing Business :**

The Policy should be aims at creating a favourable climate for investments in the Data Centre Sector, both domestic investments and Foreign Direct Investments, and incentivizing the growth of a



robust and sustainable Data Centre sector in the country through the following reforms:

(i) Providing Infrastructure Status to the Data Centre Sector

Government of India should work towards providing “Infrastructure status” for the Data Centre sector, at par with other sectors like Railways, Roadways and Power, bringing in the benefits of availing long-term credit from domestic and international lenders at easier terms. This will provide a boost to the investments in this sector.

(ii) Simplify clearances for setting up Data Centres in India :

(a) Rationalize the clearances required to set-up Data Centres/ Data Centre parks in the country. Institutionalize processes for granting single window clearance, in a time bound manner by State Governments / UTs.

(iii) Setting up of Pre-provisioned Data Centre Parks

4.6 States shall be encouraged to demarcate specific zones (land parcels) for setting up Data Centre parks with necessary infrastructure like road connectivity, availability of water and other essential infrastructure items.

4.7 Promote pre-provisioned Data Centre parks, to enable 'plug and play' model for Data Centre providers, by provisioning access to:

i) Land parcel

ii) Power availability at low rates

iii) High capacity network back-haul

iv) Pre-approved clearances/ approvals

4.8 Central and State Governments shall formulate their respective schemes and guidelines detailing out fiscal and non-fiscal incentives in this sector to enable further expansion of Data Centres in the country.

4.9 Formulation of Data Centre Incentivization Scheme (DCIS) for promotion of Data Centre Parks / Data Centre.

✓ A Data Centre Incentivization Scheme (DCIS) should be formulated by Government of India which would specify the intended beneficiaries, applicability criteria and fiscal and non-fiscal incentives for the sector.

✓ Incentives can also be provided on usage of domestic IT hardware including servers, storage, network devices, etc.

and non-IT equipment such as mechanical, electrical, plumbing, cooling equipment etc

**Q.5: What specific incentive measures should be implemented by the Central and/or the State Governments to expand the Data Centre market to meet the growth demand of Tier-2 and Tier-3 cities and least focused regions? Is there a need of special incentives for establishment of Data Centres and disaster recovery sites in Tier-2 and Tier-3 cities in India? Do justify your answer with detailed comments.**

**Comments :**           **Mentioned Above.**

**Q.6: Will creation of Data Centre Parks/Data Centre Special Economic Zones provide the necessary ecosystem for promoting setting up of more Data Centres in India? What challenges are anticipated/observed in setting up of new Data Parks/zones? What facilities/additional incentives should be provided at these parks/zones? Do give justification.**

**Comments :**           **Yes.           Mentioned Above.**

**Location and land limits** – It is important to understand that the development of a data center differs from the development of other real estate asset classes. Before deciding on a location, a broad number of factors must be considered, as not every site is suitable for a data center critical evaluation must be carried out while

keeping in mind the city dynamics and GDP, enough power infrastructure, land availability without any drawbacks, access roads, the feasibility of creating cable routes, availability of water resources, and competent workforce in mind.

In order to rule out such places, detailed analyses of criteria such as seismic activity, flood records, aircraft patterns, distance from transportation hubs, the existence of any industry with hazardous emissions, and closeness to establishments such as residential areas are performed. As a result, accessing land banks in cities with these specific conditions is challenging.

**Q.7: What should be the draft broad guidelines to be issued for Data Centre buildings, so as to facilitate specialized construction and safety approvals?**

**Comments :**

- 7.1 Recognize Data Centres as a separate category under National Building Code
- 7.2 Data Centre buildings require different norms as compared to other office/ commercial buildings and therefore, there is a need for creation of a separate category code for Data Centres in the National Building Code of India (NBC 2016).

7.3 TRAI and Ministry should collaborate with authorized Central Govt. bodies for drafting broad guidelines to be issued for Data Centre buildings, facilitating specialized construction and safety approvals.

**Q.8: Is there a need to develop India-specific building standards for construction of Data Centres operating in India? If yes, which body should be entrusted with the task? Do provide detailed justification in this regard.**

**Comments :**           **Yes.           Mentioned Above.**

**Q.9: Till India-specific standards are announced, what standards should be followed as an interim measure?**

**Comments :**   **Mentioned Above.**

**Q.10: Should there be a standard-based certification framework for the Data Centres? If yes, what body should be entrusted with the task?**

**Comments :**           **Yes.**

**TRAI** should look after implementation of standard-based certification framework for the Data Centers.

**Q.11: Should incentives to Data Centres be linked to the certification framework?**

**Comments :** **Yes for transparency and quality.**

**Q.12: Are there any specific aspects of the disaster recovery standard in respect of Data Centres that needs to be addressed? If so, then provide complete details with justification.**

**Comments :** **Yes.**

1. Assess Risks to Data and Operations
2. Develop a Disaster Recovery Plan
3. Identify Off-Site Backup Location
4. Plan to Resume Operations
5. Assign Roles for the Disaster Recovery Plan
6. Update and Test the Plan

**Q.13: Whether trusted source procurement should be mandated for Data Centre equipment? Whether Data Centres should be mandated to have security certifications based on third-party Audits? Which body should be entrusted with the task? Should security certifications be linked to incentives? If so, please give details with justifications.**

**Comments :**

1. Yes, Procurement from trusted source should be mandated for Data Center equipment.
2. Data center must be mandated to have security certifications based on Third-Party Audit.
3. Entrusted body should be prescribed by TRAI.
4. Security Certification should not be linked to incentives.

**Q.14: What regulatory or other limitations are the Data Centre companies facing with regards to the availability of captive fiber optic cable connectivity, and how is it impacting the Data Centre deployment in the hinterland? How can the rolling out of captive high-quality fiber networks be incentivized, specifically for providing connectivity to the upcoming Data Centres/data parks? Do justify.**

**Comments : No Comments.**

**Q.15: What are the necessary measures required for providing alternative fiber access (like dark fiber) to the Data Centre operators? Whether captive use of dark fiber for DCs should be allowed? If so, please justify.**

**Comments : No Comments.**

**Q.16: What are the challenges faced while accessing international connectivity through cable landing stations? What measures, including incentive provisions, be taken for improving the reliable connectivity to CLS?**

**Comments :** No Comments.

**Q.17: Is the extant situation of power supply sufficient to meet the present and futuristic requirements for Data Centres in India? What are the major challenges faced by Data Centre Industry in establishment of Data Centres in naturally cooled regions of India? What are the impediments in and suggested non-conventional measures for ensuring continuous availability of power to companies interested in establishing Data Centres in the country? What incentivization policy measures can be offered to meet electricity requirements for Data Centres?**

**Comments :**

The service sector has been experiencing a significant growth in India and a major part of this is attributable to the IT Sector. High tech facilities in this sector is making it one of the fastest growing energy use sector. The worldwide expansion of data in electronic form has resulted in establishment of mega data centers which are challenged by their high energy consumptions is estimated that the initial cost of setting up data center is only 5% of its total



cost over its life cycle of 15-20 years with energy costs making up the larger fraction of costs.

The need for Data Centre infrastructure in the country already opens up a potential opportunity for investments of the order of USD 4.9 billion by 2025, which could be further increased given we progress in the direction of becoming a Data Centre location of choice for global players. Currently, as per various estimates, India has around 375 MW installed power capacity for Data Centre and as per projections, this may grow to three times by 2025.

Given that India is running the world's largest clean energy programme, the government wants to leverage cost effective solar and wind power to supply electricity to these data centres by encouraging electricity storage applications.

According to the government, India has around 375MW of installed power capacity for data centres, which is expected to grow threefold by 2025. Also, there is a \$4.9 billion investment opportunity by 2025 for setting up data centre infrastructure. India currently has an installed renewable energy capacity of 89.63GW, with 49.59GW capacity under execution.

**Q.18: Should certification for green Data Centres be introduced in India? What should be the requirement, and which body may**

**look after the work of deciding norms and issuing certificates?**

**Comments :**           **Yes.**

TRAI should look after the work of deciding norms and issuing certificate.

**Q.19: Are there any challenges/restrictions imposed by the States/DISCOMs to buy renewable energy? Please elaborate. Please suggest measures to incentivize green Data Centres in India?**

**Comments :**           **No Comments.**

**Q.20: What supportive mechanisms can be provided to Data Centre backup power generators?**

**Comments :**

Datacenter is highly energy intensive. With the increasing energy cost, the increase in operational cost is inevitable. Therefore it becomes necessary to reduce the energy consumption to offset the increasing operational cost and to maintain competitiveness. Hence the Datacenters in India need to incorporate innovative designs for energy efficiency and embrace the concept of “Green IT” for sustained growth.

Existing Datacenters need to adopt the best practices in design, operation and maintenance to achieve operational excellence. New datacenters have to adopt the energy efficiency measures by design. It is necessary to identify and disseminate the best practices followed in Indian Datacenters as well as provide guidelines on incorporating energy efficiency aspects at design stage for new datacenter.

Energy efficiency in Datacenters offers three fold benefits:

1. Increased national availability of energy
2. Reduction in operating costs
3. Enhanced efficiency in datacenter design & operation leading to climate change mitigation

Data centers need reliable backup power to protect critical data. Data center downtimes can mean major access problems translating to huge revenue losses for businesses. Outages can also damage important equipment, threatening a return to normal function. Immediate, uninterruptible power supply (UPS) systems that incorporate backup power, power switching control, and generator synchronization management are essential to avoid these costly and damaging downtimes and increase efficiency.

Traditionally, data centers have run using local grids with backup diesel generators, because an outage could cost a business millions of dollars. It is estimated that data centers are responsible for about 1% of all electricity consumed worldwide. As technologies

grow, so does the demand for data storage, which leaves a significant carbon footprint.

1. Gas turbines and power modules offer stable, cost-effective solutions for data centers' regular and emergency power needs. These systems require less space than traditional diesel generators, are easily installed and scalable, and produce fewer emissions while increasing a data center's uptime and efficiency.

Gas power can also be integrated into hybrid data center DC architectures. In these configurations, gas generators and renewable energy- or energy storage-powered generators work together as a reliable, dispatchable power source that can help meet a data center's needs while continuing to reduce its greenhouse gas emissions.

2. Solar Energy
3. Fuel cells can be used to support critical loads for energy reliability, security, sustainability, and economic benefit. They offer potential for backup or prime power, micro grids, grid support, and combined heat and power applications in the data center.
4. Hydrogen fuel cell systems in supplying prime or backup power to critical loads of data centers.
5. diesel generators (for backup power)

When critical infrastructure systems can respond to changes in density, capacity and availability created by new technology and changing business conditions, a greater operating flexibility, higher system availability, improved optimal fail-safe electrical design can be achieved and all this, in an Energy Efficient manner. It is essential to start planning and doing our Datacenter Electrical installations with high Efficiency benchmarks by choosing equipment having higher efficiency by design, selecting just the right, types, sizes and ratings of panels, devices and components, planning the layouts in a manner that minimizes transmission and heat losses. It requires a thorough understanding of power requirement of cooling system, the UPS systems and Utilities, the lighting loads and the critical IT loads. The power requirements of these elements may vary substantially but can be estimated precisely once the power requirement of the planned IT system is determined.

**Q.21: Availability of Water is essential for cooling of Data Centres, how the requirement can be met for continuous availability of water to the Data Centres? Are there any alternate solutions? Please elaborate.**

**Comments :**

Water is a valuable natural resource that is found in different forms in the environment. It is important to understand how water moves through the environment so that we can understand how to manage it successfully. Water shortages are becoming a global issue,

due to an increasing population, economic growth and climate change. A lack of clean, fresh water can hinder the efforts to reduce poverty and progress national development, resulting in poor health, low productivity, food insecurity and restricted economic development.

**21.1** One can get the water from :

- Surface waters.
- Lakes and streams.
- Ponds.
- Rivers.
- Storage reservoirs.
- Forms of underground sources.
- Artesian springs.
- Gravity springs For the Data Center.

**21.2** Environmental and water scarcity issues are expected to impact industrial facilities increasingly in the coming years, driving up both sourcing and discharge costs. To conserve water and prepare for these future challenges, the data industry should begin to look at water conservation strategies.

**21.3** Reusing water in industry has the potential to reduce the costs of water supply and wastewater treatment by industries and reduces pressure on water resources. **Wastewater** can be reused within a business itself, or between several businesses through industrial symbiosis. Depending on the type

and quality of the wastewater, it may either be reused directly, or treated before reuse (i.e. recycled).

### **Advantages**

- Reduces the amount of water used.
- Reduces water bills.
- Reduces the volume of generated wastewater (no waste).
- Reduces costs through industrial symbiosis (by-product reuse, sharing management of utilities, sharing ancillary services).

### **Disadvantages**

- Requires high knowledge about quality of water for reuse.
- Requires financial investments.
- Requires a high level of trust between industries.
- Requires modification of current operations both for direct reuse and treat-and-reuse.

**21.4** Almost any business can incorporate measures for reuse of wastewater. While direct reuse measures may be relatively easy to implement, the cost of implementing wastewater treatment systems may prohibit wastewater recycling within a business.

**21.5** Between businesses, wastewater reuse potential depends on factors such as the distance between the businesses (cost of transport) and the wastewater production volume and

quality. If wastewater treatment is needed, the participation of several businesses may significantly reduce treatment costs and therefore enable

**21.6** The commercial centres usually have a setup in the large area of a property. This makes the installation of rainwater harvesting systems in these premises even more effective since they can offer large rainwater catchment areas and area for water storage tanks. The investment and expenses incurred by a business are massive. Any cost-saving system installed for these businesses can lead towards better utilization of resources and greater ROI.

### **21.7 Legislation's for Rainwater Harvesting in India :**

**21.7.1** The Central and State government in India are extending their support to make the practice of rainwater harvesting a success. Along with the initiatives like Rainwater Harvest Challenge (took up by Chennai Metro Water), many state authorities have made it a mandate for commercial and residential buildings to have rainwater harvesting system, under certain norms.

**21.7.2** In Indore, Madhya Pradesh, all new buildings with an area of 250 Sq. Meter or more must have RWH system installed.



**21.7.3** Similarly, the construction companies and owners of the commercial buildings in other states have to make provision for setting up RWH system based on state-specific building area mandate – buildings having 1000 Sq. Meter plinth area in Himachal Pradesh, Kanpur, and New Delhi; 1500 Sq. Meter covered area in Ahmedabad; 300 Sq. Meter or more in Hyderabad and so on.

**21.7.4** In certain states, a rebate of 6 % on property tax has been offered to all the owners having rainwater harvesting systems installed on their building.

**21.7.5** In the State of Maharashtra, a 5% rebate is provided in general tax, under the pretext of rainwater harvesting.

**Q.22: Whether the existing capacity building framework for vocational or other forms of training sufficient to up skill the young and skilled workforce in India for sustenance of Data Centre operations? What dovetailing measures for academia and industry are suggested to improve the existing capacity building framework, and align it with the emerging technologies to up skill the workforce in India?**

**Comments :** No.

**Capacity Building and Human Resource Development**

- 22.1 Collaborate with Ministry of Skills Development and Entrepreneurship (MSDE) and leading academic institutes to impart large scale trainings to workforce on Data Centre, Digital and Cloud technologies, and facilitate sector linkages for such trained workforce.
- 22.2 Promote skill development and upgradation initiatives aimed at addressing the skill gap of trained manpower to be able to meet the demands of Data Centers and Cloud Computing Platform.
- 22.3 Design programs for continuous capacity building amongst government officials and personnel on Data Centre and cloud technologies, data classification, storage policies, data security and other allied technologies.

**Q.23: Is non-uniformity in state policies affecting the pan-India growth and promotion of Data Centre industry? Is there a need for promulgation of a unified Data Centre policy in India, which acts as an overarching framework for setting Data Centres across India? What institutional mechanisms can be put in place to ensure smooth coordination between Centre and States for facilitating DC business? Do support your answers with detailed justification.**

**Comments :** Yes.

**Q.24: What practical issues merit consideration under Centre-State coordination to implement measures for pan-India single-window clearance for Data Centres?**

**Comments :**               **No Comments.**

**Q.25: Is there a need for Data Centre Infrastructure Management System (DCIM) for Data Centres in India? What policy measures can be put in place to incentivize Data Centre players to adopt the futuristic technologies? Elaborate with justification.**

**Comments :**               **Yes.**

**Policy requirements** –With the presence of strong governments at the state and central level, concerted efforts are needed on several fronts, including creation of single-window clearances, uninterrupted power at affordable costs, 5G rollout, provision of financial incentives, efficient tax structures and stamp duty exemption on land purchase, amongst others. Data centres are different from commercial buildings, requiring a different set of norms. Thus, the government has to build far-sighted policies around such requirements. Recently, the Ministry of Electronics and Information Technology has issued a draft policy framework for intervention/promotion of data centres in India and it is expected

that once the proposals are implemented, much of the issues constricting the growth of data centres would be resolved.

Data centre operations were to see significant strides in the year 2020, but the COVID-19 crisis put the spanner in the works. However, the importance of data centres has only increased, and it was accorded the status of essential services during the pandemic. It is expected that the draft policy on data centres, when implemented, would help incentivize the sector and lend confidence to global operators and investors looking at India as a preferred data centre destination. It is only a matter of time before India catches up with the developed world.

**Q.26: What institutional mechanism needs to be put in place to ensure digitization of hard document within a defined timeframe?**

**Comments :**     **Mentioned Above.**

**Q.27: Would there be any security/privacy issues associated with data monetization? What further measures can be taken to boost data monetization in the country?**

**Comments :**             **Yes.**

**Growing Security Concerns**

Data centers in India store, manage and process massive chunks of data. Being a trove of valuable enterprise information, data center facilities are vulnerable to security risks. One of the biggest threats comes from people-this can be from their own employees, third-party users accessing the network or privileged users such as IT admins.

Data centers often overlook the physical security of their IT assets. Servers or hard drives no longer in use often lie idle and, if not sanitized properly, can lead to leakage of valuable information. In addition to this, advancements in IoT technology bring more devices and connections in the data center network creating new, unforeseen challenges for managers.

With the proliferation of digital devices and high-speed networks, the growth of data centers in India will continue unabated. This will exacerbate the aforementioned challenges, and possibly, bring newer ones to the fore. Data centers need to act well in time to prevent these from overstraining their resources.

**Q.28: What long term policy measures are required to facilitate growth of CDN industry in India?**

**Comments :**                   **Mentioned above.**

**Q.29: Whether the absence of regulatory framework for CDNs is affecting the growth of CDN in India and creating a non-level-playing field between CDN players and telecom service providers?**

**Comments :** Yes.

**Q.30: If answer to either of the above question is yes, is there a need to regulate the CDN industry? What type of Governance structure should be prescribed? Do elucidate your views with justification.**

**Comments :** Yes.

**Q.31: In case a registration/licensing framework is to be prescribed, what should be the terms and conditions for such framework?**

**Comments :** No Comments.

**Q.32: What are the challenges in terms of cost for growth of CDN? What are the suggestions for offsetting such costs to CDN providers?**

**Comments :** No Comments.

**Q.33: Do you think CDN growth is impacted due to location constraints? What are the relevant measures required to be taken to mitigate these constraints and facilitate expansion of**

**ecosystem of Digital communication infrastructure and services comprising various stakeholders, including CDN service providers, Data Centre operators, and Interconnect Exchange providers expansion in various Tier-2 cities?**

**Comments : No Comments.**

**Q.34: What measures can be taken for improving infrastructure for connectivity between CDNs and ISPs, especially those operating on a regional basis?**

**Comments : No Comments.**

**Q.35: Is there a need to incentivize the CDN industry to redirect private investments into the sector? What incentives are suggested to promote the development of the CDN industry in India?**

**Comments : No Comments.**

**Q.36: How can TSPs/ISPs be incentivized to provide CDN services? Please elucidate your views.**

**Comments : Mentioned above.**

**Q.37: Are there any other issues that are hampering the development of CDN Industry in India? If there are**

**suggestions for the growth of CDNs in India, the same may be brought out with complete details.**

**Comments : No Comments.**

**Q.38: Do you think that presently there is lack of clear regulatory framework/guidelines for establishing/operating Interconnect Exchanges in India?**

**Comments : Yes.**

**Q.39: What policy measures are required to promote setting up of more Internet Exchange Points (IXPs) in India? What measures are suggested to encourage competition in the IXP market?**

**Comments : No Comments.**

**Q.40: Whether there is a need for separate light-touch licensing framework for operating IXPs in India? If yes, what should be the terms and conditions of suggested framework? Do justify your answer.**

**Comments : No.**

**Q.41: What business models are suitable for IXPs in India? Please elaborate and provide detailed justifications for your answer.**

**Comments : No Comments.**



**Q.42: Whether TSPs/ISPs should be mandated to interconnect at IXPs that exist in an LSA? Do justify your response.**

**Comments :**               **No Comments.**

**Q.43: Is there a need for setting up IXP in every state in India? What support Govt. can provide to encourage setting up new IXPs in the states/Tier-2 locations where no IXPs exist presently?**

**Comments :**               **Yes.**

**Q.44: Whether leased line costs to connect an existing or new IXP is a barrier for ISPs? If yes, what is the suggested way out? What are other limitations for ISPs to connect to IXPs? What are the suggestions to overcome them?**

**Comments :**               **No.**

**Q.45: Is the high cost of AS number allocation an impediment for small ISPs to connect to IX? If yes, what is the suggested way out?**

**Comments :**               **Yes.**

**Q.46: What other policy measures are suggested to encourage investment for establishing more number of IXPs? Any other issue relevant with IXP growth may be mentioned.**

**Comments :**                   **Mentioned Above.**

**Q.47: How can the TSPs empower their subscribers with enhanced control over their data and ensure secure portability of trusted data between TSPs and other institutions? Provide comments along with detailed justification.**

**Comments :**

- 1.** User privacy should be ensured appropriately in the telecommunications layer - both from external agents who may wish to cause harm to users (for instance, by stealing their personal data for purposes of fraud) and from entities in the telecom space who may wish to (mis)use user data that they have access to (for instance in the form of unsolicited targeted advertising).
- 2.** It is worth reiterating that Telecom Service Providers (TSPs) control the "pipes" through which information is exchanged. Due to increasing computing power, TSPs may have an increased ability to analyze the contents of the pipe i.e. the data flow of users, leading to obvious privacy concerns.
- 3.** In addition to TSPs, the widespread adoption of smart devices amongst the populace is also a trend that must be

considered. Unlike in the past, when the intelligence was residing in the telecommunication networks only and user devices were not intelligent, now, smart devices (including Operating systems, Browsers, Applications etc) are increasingly playing a gate-keeping role over the network: they determine how users connect to and experience a network. As with TSPs, all user data flows through these smart devices, putting the Device Manufacturers, Browsers, Operating Systems, and Applications etc. in a prime position to collect and process the personal information of users. Given that all user data has to pass through the TSPs (analogous to pipes) and devices (analogous to faucets) it is essential that appropriate steps should be taken to protect user privacy vis-a-vis these entities.

4. The subject of data ownership, privacy, and security is multi-dimensional and complex, and hence data consumers must be empowered to navigate safely and securely through the maze of the digital eco-system.
5. As the economy increasingly moves to the digital/online world, it is all the more important that users are appropriately protected from all entities in the ecosystem that may seek to take advantage of their gate-keeping power.
6. Providing and maintaining a superior customer experience—that is, one that's relevant and personalized—not only

delights the customer, it also pays dividends for your organization.

7. Increases customer loyalty: when customers are satisfied, they are likely to stay with a business for long, which boost sales and profitability.
8. Gives competitive advantage: customer satisfaction helps telecommunication operators achieve competitiveness because their customers are less interested in a competitor.
9. Increases word of mouth awareness: word of mouth is a prominent and effective form of advertising that all operators should embrace. Satisfied customers are likely to recommend their business and products to their personal connections including friends and families.
10. Reduces marketing expenses: when satisfied customers become the advocates and brand ambassadors, they help them generate new customers. Service Providers will get repeat purchases without a high promotional expenditure.
11. Increases sales: satisfied customers assure repeat business, offer referrals, and reduce churn, which increases your sales.

## **Data Portability :**

### **Linked to other rights**

Data portability is part of a larger spectrum of data subject rights: access to and rectification or erasure of personal data, the

right to object to decisions based on automated means, as well as notifying data subjects of a personal data breach. Again, Service Provider will need to implement supporting processes to be able to comply with these requests. For Service Provider the process to carry out a request to port data could imply that they must facilitate different actions that are similar to the execution of other data subject rights. First, the service provider may have to give the individual access to the personal information so that he knows what personal data is being processed. Second, service provider could have to rectify inaccuracies if the individual requests so; and third service provider might have to erase all the personal data (compliant with established retention schedules and legal contracts) if the individual asks to transfer his data to another service provider. Therefore three other data subject rights could be impacted when processing a data portability related request. Note however that the right of access, rectification and erasure are not similar to the right to data portability, it merely could imply that the service provider uses the same processes for these rights as it would need to facilitate the right to data portability.

The service provider have to have the ability to provide the customer with a copy of all the personal data that they have regarding him or her; and the ability to transfer the data to another data service provider. The data that the service provider have regarding a costumer should be interpreted as all the data that the individual has provided actively and knowingly. This includes

information the individual has provided to the service provider by using the service or device (for example, location data or heartbeat from a fitness tracker) etc.. This could therefore be a large collection of data. Furthermore the data must be provided in a way that facilitates reuse. For example, email must be provided in a format which preserves all the meta-data to allow effective reuse. Providing emails in pdf format would not suffice, because this is insufficiently structured for reuse. Apart from this :

1. Service provider should recognize a Data portability request.
  2. Service provider should know what type of data the right of portability applies to and when they can refuse a request.
  3. Service provider should transmit personal data in a structured, commonly used, machine readable format.
  4. Service provider should use a secured method to transmit data.
  5. sensitive data relating to health, sexuality, religious beliefs, etc. should be protected.
  6. privacy should be maintained.
7. Following 8 fundamental rights related to customer's personal data should be protected:
- ✓ Right to be informed.
  - ✓ Right of access.
  - ✓ Right to rectification.

- ✓ Right to erasure/to be forgotten.
- ✓ Right to restrict processing.
- ✓ Right to data portability.
- ✓ Right to object.
- ✓ Rights in relation to automated decision making and profiling.

8. Service Provider should think about developing a user-friendly tool or interface that involves the individual and gives them more transparency, insight and control over their own data than other competitors.

**Q.48: What is the degree of feasibility of implementing DEPA based consent framework structure amongst TSPs for sharing of KYC data between TSPs based on subscriber's consent?**

**Comments :**                **No Comments.**

**Q.49: Are there any other issues related to data ethics that require policy/regulatory intervention apart from the issues that have already been dealt with, in TRAI's recommendations on the issue of 'Privacy, Security and ownership of the Data in the Telecom Sector' dated 16th July 2018 and the draft PDP Bill? Provide full details.**

**Comments :**                **No.**

**Q.50: Stakeholders may also provide comments with detailed justifications on other relevant issues, if any.**

**Comments : No.**

Yours faithfully,  
( Dr. Kashyapnath )  
President  
Member Organization : TRAI