Email   **Saumyata Bhargava**

Fwd: Comments on the Consultation Paper on " Digital Inclusion in the Era of Emerging Technologies ".

From : S.M.K. Chandra <ja-cadiv@trai.gov.in>   Mon, Oct 23, 2023 10:40 AM

Subject : Fwd: Comments on the Consultation Paper on " Digital Inclusion in the Era of Emerging   📎1 attachment
Technologies ".

To : Saumyata Bhargava <Saumyata.bhargava@trai.gov.in>

From: knath21@yahoo.in
To: "S.M.K. Chandra" <ja-cadiv@trai.gov.in>
Cc: "Joint Advisor CA" <jaca@trai.gov.in>, traijaipur@gmail.com, "श्याम सुंदर चांडक - Shyam Sunder Chandak, Advisor (RO-Jaipur)" <adv.jaipur@trai.gov.in>
Sent: Sunday, October 22, 2023 3:16:36 PM
Subject: Comments on the Consultation Paper on " Digital Inclusion in the Era of Emerging Technologies ".

CONSUMER PROTECTION ASSOCIATION
HIMMATNAGAR
DIST. : SABARKANTHA
GUJARAT

Hon. Sir,

Namaskar.

Please find herewith our comments on the Consultation Paper on "

Digital Inclusion in the Era of Emerging Technologies ".

You are requested to do needful and oblige.

Thanks.

Your faithfully,

(Dr. Kashyapnath)
President
Member Organization : TRAI

Encl. : Comments.

Comments.pdf
2 MB

CONSUMER PROTECTION ASSOCIATION
HIMMATNAGAR
DIST. : SABARKANTHA
GUJARAT

Comments

on

Digital Inclusion in the Era of Emerging Technologies

Introduction :

The seeds of a digitally connected India were sown in the early 90s and 2000s with a number of diverse but disjoint e-governance programs. However, these resulted in limited impact on citizens.

With an unprecedented mandate and a clear vision, the current government is pushing ahead the Digital India initiative, which has the potential to transform the lives of citizens across the length and breadth of the country. Digital India differs from previous efforts as it provides a combined vision and a comprehensive execution plan, bringing together

various departments as well as existing and new programs that are monitored and influenced centrally by the government.

Technology is key to the vision of a Digital India. Social Media, Mobility, Analytics and Cloud are the foundations that will enable the Digital India visions of providing "governance and services on demand" and "digitally empowering citizens" and support the social inclusion schemes being launched by the government.

Along with the public sector, the private sector can also play a significant role in fulfilling the vision of Digital India by providing the last mile access, location specific Wi-Fi access (e.g., schools, universities, public Wi-Fi) and development of applications that provide cloud-based services on demand to citizens, like branchless banking, remote health, remote education, skill development and e-justice. The Digital India initiative will, over the next few years, extend the reach of government services and essential schemes to the remotest parts of the country, providing citizens on-demand, cloud based services and creating millions of jobs. Despite the increased focus and pace, execution remains the most significant challenge for the government. Providing "infrastructure as a utility to every citizen" is one of the key visions of the programme.

E-governance initiatives in India have traditionally being confronted with the dual challenges of automating government departments and taking online services to the common man. But now e-governance has moved beyond government departments just having a portal. It is no longer confined to merely streamlining and automating processes. It is

about transforming the way governments work and reinventing people's participation in the democratic process. It is about empowering both the government and the citizen. Technology will be the enabler for the citizen to transcend the boundaries of departments and ministries, and provide a single platform for interaction with its citizens, thus promoting participatory governance and increased transparency and revolutionizing public service delivery.

This is the decade of broadband – and we all recognize the vital importance of broadband as a social and economic development tool, and as a critical component of smart society. The Digital India programme is aimed at further bridging the divide between digital "haves" and "have-nots". It is an opportune time for both the industry and the government to from a synergistic partnership towards bolstering India's socioeconomic development through digital empowerment. The initiatives of e-health, e-education and a wide variety of citizen services, can be delivered to rural citizens subject to conducive and progressive policy initiatives by the government and with the participation of the entire ecosystem. However, the need of the hour is to adopt a grassroots approach starting from the State-level with key enablers being awareness building and imbibing the benefits of e-services especially for the underserved parts of the country.

India has been globally recognized for its capacity to innovate in the digital space. The country is also leading the campaign to support various countries around the world, especially the Global South, to learn from each other in tackling the digital and connectivity challenges.

Over the last few years, digital transformation has become a strategic priority for governments and businesses, from being a boardroom buzzword. While India has been long known for its vast IT talent and high technology adoption in industries, the country has also been leading the way in leveraging technology to empower its citizens and strengthen governance. With more than 500 million internet users, the country is among the leading and fastest growing digital consumer markets. Additionally, being a vibrant start-up market allows India to foster innovation further and standardize new technologies.

The Digital India programme was launched to create a digitally empowered society and a knowledge based economy, ensuring digital access, inclusion, and empowerment, through initiatives such as Aadhaar, Digi Locker, Digital village, Aarogya Setu App, etc. Additionally, the rise of the FinTech sector has accelerated financial inclusion in the country. Further expansion of digital payments is an important pivot for creating a more equitable, prosperous, and financially inclusive India.

Recent years have led to significant technological advancements, with the improving computing power enabling more people globally to join the digital economy. Further enhancement of digital capabilities is expected to strengthen connectivity, significantly impacting various sectors and the overall economy. There is a rising trend across sectors wherein digital platforms are recasting relationships between customers, employees, and employers.

The pandemic accelerated technological transformation by many years, as technology became the backbone of continuity across various sectors and ensured financial and social inclusion for the citizens. It also provided an opportunity for India to set global benchmarks for others to follow suit in terms of leveraging technology for enhanced transparency, increased compliance, improved delivery of public services, widened digital payments, and strengthened e-governance.

As India focuses on enhancing its manufacturing prowess and embedding itself as a preferred hub across global value chains, digital transformation on the back of emerging technologies, such as AI, ML, IoT, robotics, blockchain, and cloud computing, will drive economic value. With the advent of the Fourth Industrial Revolution, various emerging technologies are being leveraged at an accelerated rate to enhance competitiveness. Harnessing the full potential of these new technologies to strengthen competitiveness will have to be supported by policy frameworks that ensure such technologies work responsibly for people and the planet.

The software and services industries have strongly driven the past few decades in India, and the country is now positioning itself to leverage the opportunity in semiconductor design and manufacturing. In many ways, almost every industry is now a technology industry, with semiconductors driving innovation and efficiency in the digitized world. As we look to strengthen self-reliance and enhance the share of domestic

production in the market, there will have to be consistent efforts toward skilling, research and development, and IP protection.

The G20 presidency is an opportunity for the country to reinforce its role as a global leader in communications and the increasing use of digital technologies. The G20 forum will also allow India to promote investment in digital infrastructure, encourage innovative and agile governance, enhance digital skills and training, improve data free flow with trust, enforce intellectual property rights (IPR), and boost technology adoption by MSMEs.

India is reshaping itself in the age of digital globalization. India is experiencing a digital revolution across segments - consumers, investors, workers, businesses and the Government - all use technology to enhance transparency, gain improved access and leverage higher efficiencies. At the same time, technology is triggering transformative developments in e-payments, e-commerce, geographic mapping, digital literacy, financial inclusion, and rural development, among many others.

CHAPTER 5 - SUMMARY OF ISSUES FOR CONSULTATION

Status of Digital Inclusion

Q.1 What should be the definition of Digital Inclusion? What all parameters should it include to highlight disparities across different segments of society to have a realistic assessment from a policy perspective? Please provide your answer with suitable justification.

Comments :

Definition :

1. The digital inclusion definition is the policies and programs that provide access to the internet <u>regardless of race, gender</u>, income or ability.

   According to the <u>National Defense Industrial Association</u>, USA, digital inclusion includes five elements:

   1. Affordable, robust, broadband internet service to every one
   2. Internet-enabled devices that meet the needs of the user
   3. Access to digital literacy training
   4. Quality technical support
   5. Applications and online content designed to enable and encourage self-sufficiency, participation and collaboration

2. Social efforts to make all people enjoy the benefits of Digital Technology by making all people participate in the Digital World without discrimination or exclusion.

Policy Perspective :

Vision Should be :   Make a digital inclusive nation for all

   The digital inclusion policy should encourage all citizens to be motivated to join & actively seek for benefits from the Digital Society.

The policy target should be all groups of people who lack capabilities or motivations for digital technology.

(a) Targeting the vulnerable & all citizens including Elderly, Disabled etc..

(b) Active Approach : Motivate to join, widely provide digital benefits

(c) Passive Approach :   - Increase accessibility

                     - Build Capability

(d) Efforts by All Stakeholders : Collaboration of CAG's, Civil Societies,

                     Businesses & Government.

(e) Led by Government : Support as a part of Social Welfare.

Implementation Task :

1. **Make sure that all people have comprehensive digital capabilities :**

   ➢ **Establish digital education system easily accessible by anyone :**

   (a) Operate Digital learning center

   (b) Diagnose individual capability level by developing " Digital Capability Level " and provide customized digital capability training platform.

   ❖ Provide integrated information on online and offline training in the public and Private sector.

   ➢ **Make Sure that Public is equipped with SW and AI capabilities :**

(a) Expand SW/AI learning opportunities within regular curriculum of elementary, middle and High schools.

(b) Provide online and off line life-long learning course on AI for adults.

➢ **Make a clean cyber world by providing training to prevent the negative impact of Digital :**

Expand 1-person media etiquette internet ethics, prevention of cyber violence education expanded.

2. **Help Vulnerable groups to easily use digital Technologies and Services :**

(a) Improve the convenience of using Broadcasting and Communication for fishing villages, the elderly, and the disabled.

➢ Establish public Wi-Fi at agricultural and fishing villages and establish high speed internet across the nation.

➢ Support for communications service cost to support non-face-to-face activities.

(b) Improve the access to digital devices and services to the vulnerable groups.

➢ Improve the institution to guarantee the accessibility to kiosk by the disabled and the elderly, develop standard HW/SW for kiosk.

➢ Consult for institutions with lack of compliance and provide technical support based on survey on access to information.

(c) Support remote learning for students from low-income families：

➢ Rent Smart device & support internet and data charge for students from low income families.

➢ Online mentoring for customized curriculum and individual learning for vulnerable group students.

3. Promote wide use of inclusive Digital Technologies and support vulnerable groups, social engagement and deployment：

(a) Expand inclusive digital technologies and service for the vulnerable group.

➢ Identify and spread intelligent information service to resolve issues of the vulnerable group.

- Develop intelligent kiosk, digital braille reading support for the visually impaired students.

➢ Support the development and distribution of assistive information and communications devices for the disabled.

- Spread the scale of device support by disability type.

(b) Support social enterprises and lay the foundation for the inclusive job creation.

➢ Establish dataset to be utilize for inclusive digital service development.

- Support digital based social enterprises
  - ICT R&D voucher, additional points for R&D recruitment, reduce license fee etc..
- Training for vulnerable groups that can lead to jobs and refresher training for the elderly equipped with ICT expertise.

4. **Build Public Private partnership and promote Community Problem Solving led by voluntary participation of citizen :**

(a) Establish public private cooperative system and support digital inclusion activities of enterprises.

- Operation of digital inclusion coalition with the participation of civil society companies and groups.
  > Digital Inclusion policy Council, Capability Council, accessibility Council etc. should be included.
- Support sustainable digital CRS activities of the private sector.

(b) Lay the foundation for resolving social issues led by the public

- Establish Regional Digital Social innovation support centers
  - Provide digital equipment and place for workshop, operate programs to nurture social innovative leaders

(c) Enact the Digital inclusion Act for sustainable digital inclusive Society :

- Promote the Digital Inclusion Act establishment of digital inclusion law and identify institutional factors to prevent discrimination and exclusion related to digital.

Q.2 **Do you agree that the indices mentioned above and developed by various international organizations for assessment adequately represent the status of Digital Inclusion in the country? What other indices and factors need to be considered to identify the gaps in Digital Inclusion in the country?**

Comments :

Digital inclusion is possible only if there is customer connect.

Assessing the status of digital inclusion in a country is a complex task that involves multiple dimensions, including internet access, affordability, digital skills, and effective use of digital technologies. Various international organizations develop indices and benchmarks to measure digital inclusion in different countries. While these indices provide valuable insights, they may not always comprehensively represent the entire landscape of digital inclusion. Here are some factors to consider:

1. Limited Scope:

Some indices might focus primarily on metrics like internet penetration rates or mobile phone usage. While these are important, they don't necessarily reflect the depth of digital inclusion, especially in terms of digital skills, online safety, and meaningful use of technology for social and economic development.

2. Urban Bias:

Indices might concentrate more on urban areas, where digital infrastructure is typically better developed, potentially overlooking rural or remote areas where digital exclusion is often more pronounced.

3. Quality of Access:

Access to the internet doesn't guarantee quality access. Factors such as internet speed, reliability, and the availability of local content in relevant languages are critical. These factors might not always be adequately captured in standard indices.

4. Digital Literacy:

Indices often struggle to measure digital literacy comprehensively. Digital literacy involves more than just basic computer skills; it includes the ability to critically evaluate online information, protect oneself from online threats, and use digital tools for various purposes.

5. Affordability:

While some indices consider internet costs, they might not account for other associated costs, such as the price of devices, which can be a significant barrier, especially for low-income individuals and families.

6. Cultural and Social Factors:

Indices might not fully consider cultural or social factors that influence digital inclusion, such as gender disparities in access, cultural norms affecting internet usage, or social stigma associated with technology use.

7. Data Accuracy and Timeliness:

Data used for these indices might not always be up-to-date or accurate, leading to potential gaps in the assessment.

8. Policy and Regulation:

Indices might not always capture the effectiveness of policies and regulations in promoting digital inclusion. Supportive policies, digital literacy programs, and initiatives aimed at bridging the digital divide are crucial factors not always reflected in indices.

9. Community Engagement:

The role of community-driven initiatives and grassroots efforts in promoting digital inclusion might not be adequately represented in standardized indices.

While international indices provide a useful starting point, it's important for policymakers, researchers, and organizations to complement this information with localized research, community engagement, and qualitative data to get a more holistic view of digital inclusion. Customized, context-specific assessments are often necessary to develop effective policies and initiatives that address the unique challenges faced by different communities within a country.

The value of Financial Inclusion (FI) Index, which captures the extent of financial inclusion across the country, improved to 60.1 in March 2023 vis-à-vis 56.4 in March 2022, with growth witnessed across all sub-indices, according to the Reserve Bank of India.

Improvements in FI Index were mainly contributed by usage and quality dimensions, reflecting deepening of financial inclusion, per a central statement.

The FI Index has been conceptualized as a comprehensive index incorporating details of banking, investments, insurance, postal as well as the pension sector in consultation with Government and respective sectoral regulators.

The FI Index comprises of three broad parameters (weights indicated in brackets) – access (35 per cent), usage (45 per cent), and quality (20 per cent) with each of these consisting of various dimensions, which are computed based on a number of indicators.

Road ahead:

Building upon the considerable headway made in digital and financial inclusion till now, the next concrete action is needed to disseminate financial and digital literacy so that the infrastructure created and distributed among the potential users is fully harnessed. The 9 crore dormant bank accounts and unused debit cards are a cause of concern. Many of the bank customers are still apprehensive about the safety of their money. The kind of cyber frauds that are attempted and the information that flows through social media causes a great hindrance in using the digital mode.

The stakeholders should work at the grass root level to allay the fears of people in using the bank accounts and digital mode for their wellbeing. The financial literacy has to percolate to provide confidence to account holders to borrow, do business and return the money back to banks in time so that circulation of credit is made possible. The end use of digital inclusion should be able to educate bank account holders to use all financial facilities – borrowing, remittances, deposits, insurance and investments so as to harness full potentiality of the efforts and investment made for digital inclusion. The untapped potentiality has to be mined to plough back to stimulate the economy. The building blocks of digital and financial inclusion should be explored to quickly reach US $ 5 trillion economy using the momentous occasion of celebrating – Azadi ka Amrit Mahotsav – 75th year of Indian independence.

Q.3 **Are Digital Connectivity, Digital Affordability and Digital Literacy the main factors responsible for Digital Inclusion in the country? Do you agree that by addressing these, Digital Inclusion can be achieved in the country? If not, please suggest any other factors responsible for Digital Divide that need to be addressed to ensure Digital Inclusion?**

Comments :   Yes.

Affordability is a challenge for all but affects disproportionally more women and girls, and remains one of the key hurdles in accessing ICTs. Also, the digital gender divide is found to increase as technological sophistication and functionality grows and with the cost of ownership

(BMZ, 2017). A study by Intel and Dalberg (2012) finds that affordability not only represents a barrier for those who are not yet Internet users, but further prevents Internet users from using the World Wide Web to its full extent, if e.g. Internet data allowances increase importantly with the quantity of megabits included in the contract. When it comes to affordability, the cost of accessing the Internet varies across countries and regions and partly depends on the level of development of the country.

The increase in private sector investments and the startup culture has accelerated India's digital revolution. Due to telecom companies' innovations in expanding the scope of digital services, domestic e-commerce is expected to increase significantly in the coming years. Furthermore, open network for digital commerce (ONDC) is among the government reforms introduced to enhance the digital revolution. It is expected to digitize the whole value chain, standardize operations, encourage supplier involvement, improve logistical efficiency, and increase customer value.

To provide affordable and quality internet, the government has invested in the BharatNet Fiber project and is developing 5G and 6G infrastructure. In the next 12-15 years, India's 5G ecosystem is expected to add $450 billion to the Indian economy. As India accelerates its journey toward becoming a global data centre hub, the country's data centre capacity is expected to increase to 1.3 GW by 2024.

Emerging technologies will further drive inclusive and equitable growth in the country. The 5G wave will significantly impact the startup ecosystem, encouraging more home-based MSMEs to expand production.

Moreover, continuous innovation in emerging technologies will help manufacture high performing robots and machines to speed up processes. In healthcare applications like autonomous surgical robots, virtual nursing assistants will lead to advancements in the health sector.

Emerging technologies will drive inclusive and equitable growth by enhancing financial inclusion through access to digital banking services, mobile payments, and e-wallets. IoT can help farmers increase crop yields, reduce wastage, and improve income in agriculture. Already, private-sector CSR activities have linked farmers to initiatives such as E-Choupal (village internet kiosks) to access weather, price discovery, agri know-how, best practices, etc. Crop quality improved, productivity increased, and prices rose as a result. It will also aid in rural development.

Likewise, telemedicine can help connect patients in remote rural areas with doctors in urban areas. Telemedicine and teleconsultations highlighted the incorporation of cutting-edge digital technologies into healthcare services. Notably, Ayushman Bharat Digital Mission linked over 5 million health records in the health sector. In terms of education, emerging technologies can provide access to education for people who do not have access to traditional schools. Online education platforms and Massive Open Online Courses can help people acquire new skills and improve their employability. What's more, SMEs can access new markets and increase their productivity. For instance, Cloud Computing can help SMEs reduce costs by providing them access to scalable computing resources. Despite the progress made, there are a few hurdles that India will have to cross before it becomes a truly digitalized economy. Some of

these include slow internet speed, data security and privacy, etc. However, the country is committed to adopting digital services as they improve citizens' quality of life, promote financial inclusion, and fuel economic growth. Therefore, it is critical for us to ensure that social, economic, and digital reforms are implemented collectively to be fully inclusive.

Digital Connectivity

Q.4 Apart from efforts made by the Government through various Projects for provisioning of broadband connectivity under NDCP 2018 and NBM 2019 and other schemes, what additional measures are required to fulfil the objectives of universal connectivity in India?

Comments :

Providing universal connectivity to all individuals, households, and communities is a complex task that requires a comprehensive and multifaceted approach. Several countries have implemented successful strategies and best practices to achieve universal connectivity. Here are some internationally recognized best practices:

1. National Broadband Plans:

Comprehensive Plans: We should utilize our national broadband plans that outline clear goals, strategies, and timelines for achieving universal connectivity. These plans should consider both urban and rural areas.

2. Public-Private Partnerships (PPPs):

Collaboration: Foster partnerships between public and private sectors to share resources, expertise, and risks. Public-private collaborations can enhance investment in infrastructure and service provision.

3. Community Networks:

Community Involvement: Promote community-driven networks where local communities actively participate in building and maintaining their connectivity infrastructure. Community networks empower residents to address their specific needs.

4. Inclusive Policies:

Inclusivity: Formulate policies that promote inclusivity, ensuring that connectivity initiatives reach marginalized or underserved communities, including rural areas, indigenous populations, and people with disabilities.

5. Subsidies and Funding:

Subsidy Programs: Implement subsidy programs or universal service funds to support the deployment of infrastructure in economically unviable or remote areas. Government funds can be used to incentivize private sector investment.

6. Infrastructure Sharing:

Shared Infrastructure: Encourage infrastructure sharing among service providers. Shared cell towers, fiber optics, and other network elements can reduce costs and accelerate deployment.

7. Regulatory Reforms:

Streamlined Regulations: Simplify regulatory processes for obtaining licenses, permits, and approvals. Reducing bureaucracy can expedite the deployment of infrastructure.

8. Spectrum Allocation:

Efficient Spectrum Use: Allocate and manage spectrum efficiently. Spectrum policies should encourage innovation, competition, and the introduction of advanced technologies.

9. Data-Driven Decision Making:

Data Analysis: Use data analytics and mapping technologies to identify underserved areas accurately. Data-driven insights inform targeted interventions.

10. Capacity Building:

Training: Provide training and capacity-building programs to local communities. Education empowers communities to take ownership of digital initiatives and use technology effectively.

11. Public Awareness:

Awareness Campaigns: Conduct public awareness campaigns to educate citizens about the benefits of digital connectivity. Informed communities are more likely to participate in digital initiatives.

12. Government-Led Initiatives:

Government Initiatives: Implement government-led projects to extend connectivity, especially in remote or economically disadvantaged regions. Publicly funded initiatives can act as catalysts for private sector involvement.

13. International Collaboration:

Knowledge Exchange: Collaborate with international organizations and other countries to share knowledge and best practices. Learning from successful global initiatives can inform local strategies.

14. Innovative Technologies:

Technology Innovation: Embrace innovative technologies such as low-Earth orbit satellites, TV white spaces, and wireless mesh networks. These technologies can be particularly effective in challenging terrains.

15. Monitoring and Evaluation:

Performance Measurement: Establish mechanisms to monitor and evaluate the performance of digital initiatives. Regular assessments help refine strategies and ensure continuous improvement.

16. Focus on Affordability:

Affordable Services: Implement policies to make internet services affordable. Affordable access encourages broader adoption, especially in low-income communities.

Universal connectivity requires a holistic approach that addresses technical, regulatory, economic, and social challenges. By combining these

best practices and tailoring them to local contexts, we can make significant progress toward ensuring that everyone has access to digital connectivity and the opportunities it brings.

Carreg and the will to adopt change is the first steps towards owning a Digitization. Digital transformation is not a short sprint but rather a marathon. Digitization cannot be covered in the shortest possible time, as the path holds a number of challenges and hurdles that need to be overcome. Just like a marathon, digitization cannot be covered in the shortest possible time, as the path holds a number of challenges and hurdles that need to be overcome.

As per the statistics, 70 per cent of digital transformation fails due to resistance from employees and lack of support from the management (McKinsey). Furthermore, only 16 per cent of employees stated that their company's digital transformation efforts enhance their performance. For this reason, a business owner, in most instances, is looking for solutions and not technology. To have the solution, they either ask to build it or buy a product. And they consider this engagement successful when it meets their business needs within time & budget.

Key challenges :

An initiative of this scale can never been conceived before and, apart from little availability of skilled manpower, execution has been a

challenge. Hence, the vision cannot be realized without tackling such looming challenges. Some of the challenges are detailed below.

1.   NOFN Infrastructure Setup :

The effort to connect about 250,000 villages through an optical fibre network has seen significant delays in the past. Just about Neglible percentage of those villages are connected to the internet through NOFN. Providing last-mile connectivity would be a challenge in the future since it is unaffordable for most Indians.

2.   Adoption of Internet :

Apart from infrastructure installation, adoption of the internet remains a concern. People in poor areas would find it difficult to afford internet through broadband or mobile. Low literacy level, lack of content with regional relevance, lack of appropriate access devices would also hinder the adoption.

3.   Data Speed :

Data speed is another area where India faces a big hurdle.

4.   Security :

With cybercrime on the rise, the idea of putting information of about a billion citizens online seems like a risky move. Hence highest levels of

security measures and protocols would need to be taken to ensure a safe environment for the citizens.

5.   Coordination and Standardization :

Various government departments such as DeitY, DoT, Law, Finance, etc. should be involved in creating systems and operational standards for a seamless integration. Such involvement would require significant levels of coordination to ensure proper flow of information.

6.   Private Sector Participation :

In order to meet the expected timelines, participation of private sector players becomes quite crucial. Whereas, private sector players have shown limited involvement, this needs to be boosted quite rapidly.

7.   Manpower :

Skilled manpower is, perhaps, the biggest challenge of all. India has nearly 475 million people engaged in labour, out of which about 93% are engaged in unorganized labour. Skilled manpower is essential for the development and effective adoption of new technologies. Creating a system to train and provide gainful employment to so many people is an immense challenge.

8.   To enable development of digital infrastructure, a **uniform (Right of Way) RoW policy** across all states with a reasonable cost structure is

required along with a single window mechanism for granting RoW permissions.

9.   PPP models must be explored for sustainable development of digital infrastructure, as has been the case for civic infrastructure projects like roads and metro. The government should try to make additional spectrum available to telecom service providers for deployment of high speed data networks.

10. Startups need to be incentivized for the development of the last mile infrastructure and localized services and applications.

11. The existing government infrastructure assets like post offices and other buildings should be leveraged for provision of digital services.

12. In rural and remote areas, private sector players should be incentivized to provide last mile connectivity.

Q.5 Whether connecting GPs/villages/village institutions through BharatNet has helped in improving digital connectivity in an effective manner? If not, what additional measures are required institutions in an efficient and time bound manner?

Comments :   Yes.

There are many problems in the way of its successful implementation like digital illiteracy , poor infrastructure, low internet speed, lack of coordination among various departments, issue pertaining

to taxation etc. These challenges need to be addressed in order to realize the full potential of this programme

A number of challenges has slowed down the pace of implementation.

1. Where there is still 25 % illiteracy the target of high level of digital illiteracy is one of the biggest challenge in the success of digital India programme. According to ASSOCHAM-Deloitte report on Digital India, Indians are still not on internet.

2. Creating an awareness regarding the Digital India scheme among common masses is also a great challenge.

3. It is a colossal task to have connectivity with each and every village, town and city. The biggest challenge is ensuring that each panchayat point of broad band is fixed up and functional. It is found that 67% of NOFN points are non functional even at the pilot stage.

4. India has very low internet speed apart from 5G.This lowest internet speed cannot facilitate online delivery of various services.

5. India's digital infrastructure is comprehensively inadequate to tackle growing increase in digital transactions. The biggest challenge faced by Digital India programme is slow and delayed infrastructure development. 6. The private participation in government projects in India is poor because of long and complex processes.

7. ASSOCHAM Deloitte Report pointed out that currently Over 50000 villages remain deprived of mobile connectivity because providing mobile connectivity in such locations is not commercially viable for service providers.

8. India lives in its villages. But it needs more amount of funds to meet the cost of infrastructure creation in rural areas than the urban areas. Division of fund among the rural and urban is not easy.

9. India has 1600 languages and dialects. Non viability of digital services in local Languages is a great barrier in digital literacy.

10. Fear of cybercrime and breach of privacy has been deterrent in adoption of digital technologies. Most of the technology including cyber security tools is imported. There is no sufficient skill to inspect for hidden malwares. India needs 1million trained cyber security professionals by 2025.

The Digital India programme should be centered on three key vision areas:

1. Digital Infrastructure as a Utility to Every Citizen:

This includes to provide high speed Internet connectivity as a core utility for delivery of services to citizens. To provide digital identity that is unique, lifelong, online and authenticable to every citizen. Providing mobile phone and bank account enabling citizen participation in digital and financial space. Easy access to a Common Service Centre. Shareable private space on a public cloud for every citizen

2. Governance and Services on Demand :

Seamless integration across departments or jurisdictions Ensuring availability of services in real-time from online & mobile platforms to make all citizen entitlements portable and available on the cloud to digitally transformed services for improving ease of doing business Leveraging Geospatial Information Systems (GIS) for decision support systems & development.

3. Digital Empowerment of Citizens :

- ✓ To empower citizen through universal digital literacy.
- ✓ To provide universal accessible digital resource.
- ✓ To make available digital resources / services in Indian languages.
- ✓ To provide collaborative digital platforms for participative governance.
- ✓ Citizens not required to physically submit Govt. documents / certificates.

Following key initiatives should be taken to increase Digital connectivity :

1. Nationwide internet infrastructure (NII) should be integrate the network and cloud infrastructure in the country to provide high speed connectivity and cloud platform to various government departments up to the panchayat level.

2. Universal Access to Mobile Connectivity :

   Increase network penetration and to provide mobile connectivity to villages by with high investment.

3. Public Internet Access Programme :

   One Common Service Centre(CSC) should be provided to each gram panchayat and Post Offices proposed to be converted into multi service centers.

4. e Governance IT should be used to make the delivery of government services more effectively. There should be integration of services and platform-UIDAI , Payment Gateway, Mobile Seva platform, Public redressal etc., through IT. All information would be available in electronic form.

5. eKranti : The aim should be electronic delivery of services to people be it education, health, financial inclusion or justice.

6. A website launched by the government to facilitate should be a 2-way communication between citizens and the government. It is a medium to exchange ideas or suggestion with government. The citizen should have open access to information through open data platform.

7. Electronics Manufacturing :

   The government should focus on zero imports of electronics through local manufacturing of items such as smart energy meters, micro ATMs, mobile, consumer and medical electronics. Government should also taking several steps to promote manufacturing and investment in electronics sector by providing clarity on taxation, incentives skill development etc.

8. IT for Jobs :

   The aim should be to train more and more people in towns and villages for IT sector jobs. It should also aims to provide training for service delivery agents as part of skill development to run viable businesses delivering IT services. It should also focuses on training of Rural Workforce on Telecom and Telecom related services and setting up of BPOs in states.

9. Early Harvesting Programs :

   Government should plans to installed Wi-Fi facilities in all universities across the country. All books should be converted into e books. Email should be made the primary mode of communication

within government . Biometric Attendance System should be installed in all central government offices where recording of attendance will be made online.

CHALLENGES :

We are facing multiple challenges in successful implementation. Few of the challenges are

1. High level of digital illiteracy is the biggest challenge in the success of digital India programme. Low digital literacy is key hindrance in adaptation of technologies . According to ASSOCHAM-Deloitte and different organization's report on Digital India, millions of Indians are still not on internet.

2. Making Digital India scheme known and creating an awareness among common masses about its benefits is also a great challenge.

3. It is a mammoth task to have connectivity with each and every village , town and city. Connecting Gram Panchayats through National Optical Fibre is a very difficult task. The biggest challenge is ensuring that each panchayat point of broad band is fixed up and functional. It is found that 67% of NOFN points are non functional even at the pilot stage.

    The biggest challenge faced by Digital India programme is the slow/delayed infrastructure development. Spectrum availability in Indian metros is about a tenth of the same in cities in developed countries. This has put a major roadblock in providing high speed data services.

4. A key component under this vision is high speed of internet as a core utility to facilitate online delivery of various services . India has low internet speed.

5. According to ASSOCHOM- Deloitte report , the issue pertaining to taxation and regulatory guidelines have proved to road block in realizing the vision of Digital India. Some of the common policy hurdles include lack of clarity in FDI policies have impacted the growth of ecommerce.

6. The biggest challenge faced by Digital India programme is slow and delayed infrastructure development. India's digital infrastructure is comprehensively inadequate to tackle growing increase in digital transactions. India needs over 80 lakh hotspots as against the availability of about 31000 hotspot at present to reach global level, according to ASSOCHOM-Deloitte report.

7. The private participation in government projects in India is poor because of long and complex regulatory processes.

8. Many request proposals issued by government are not picked up by competent private sector organizations since they are not commercially viable. Currently Over 55000 villages remain deprived of mobile connectivity because providing mobile connectivity in such locations is not commercially viable for service providers , as per the ASSOCHAM Deloitte report.

9. There is a wide digital divide between urban and rural India. Till now funds have not been deployed effectively to meet the cost of infrastructure creation in rural areas.

Q.6 **Will the schemes supported by USOF other than BharatNet suffice the need of universal connectivity in the country? If not, what additional measures or changes in strategy are required to ensure universal connectivity to all unconnected areas? Please provide your answer with suitable justification.**

Comments : **No.**

Apart from BharatNet, there are several other projects and initiatives in India aimed at promoting universal connectivity and bridging the digital divide. These projects, often supported by the Universal Service Obligation Fund (USOF) and other government agencies, focus on enhancing telecom infrastructure, expanding internet access, and improving digital services. Some of these initiatives include:

1. National Optical Fiber Network (NOFN) / Bharat Broadband Network Limited (BBNL):

NOFN, later rebranded as BharatNet, aims to connect all Gram Panchayats (village councils) in India through high-speed broadband internet. It's one of the most significant initiatives in the country for rural broadband connectivity.

2. North East BPO Promotion Scheme (NEBPS):

This scheme focuses on setting up Business Process Outsourcing (BPO) units in the northeastern states of India, providing employment opportunities and promoting digital services in the region.

3. North East Special Infrastructure Development Scheme (NESIDS):

NESIDS focuses on infrastructure development in the northeastern states, including the improvement of telecom infrastructure to enhance connectivity in the region.

4. Comprehensive Telecom Development Plan (CTDP):

CTDP focuses on improving mobile connectivity in areas affected by Left Wing Extremism (LWE) to enhance communication and security operations in these regions.

5. National Mobile Service Consumer Awareness Campaign:

This campaign aims to educate mobile users, especially in rural and remote areas, about mobile services, tariffs, and consumer rights. It promotes digital literacy among mobile users.

6. North East Mobile Coverage:

This initiative aims to improve mobile network coverage in the northeastern states of India, ensuring that people in remote areas have access to mobile communication services.

7. Indian Public Wi-Fi Network (IPWN):

The IPWN initiative aims to create a national Wi-Fi network by allowing public data offices (PDOs) and public data office aggregators (PDOAs) to provide public Wi-Fi services.

8. Government e-Marketplace (GeM):

While not directly related to connectivity, GeM is a digital platform that connects buyers and sellers for various goods and services, enhancing digital procurement methods across government departments and organizations.

9. National Knowledge Network (NKN):

NKN is a high-speed network that connects academic institutions and research facilities across the country, enabling collaboration, sharing of resources, and access to educational materials and research data.

10. Maharashtra State Rural Livelihoods Mission (MSRLM) - Digital Empowerment Program:

This initiative focuses on digital literacy and digital empowerment of rural communities in Maharashtra, providing training and support for using digital technologies.

The Universal Service Obligation Fund (USOF) in India is designed to ensure universal access to telecommunication services, especially in rural and remote areas where the private sector might be hesitant to invest due to commercial viability concerns. While BharatNet is one of the significant projects supported by USOF, there are other schemes and initiatives that aim to provide universal connectivity. However, the question of whether

these schemes will suffice the need of universal connectivity in India is multifaceted and depends on various factors:

1. Scope and Reach of Other Schemes:

If the other schemes supported by USOF have a wide scope and reach, covering not just internet connectivity but also mobile telephony and digital services, they can contribute significantly to universal connectivity, especially in remote areas.

2. Investment and Infrastructure:

The sufficiency of these schemes depends on the investment allocated and the development of necessary infrastructure. Building an extensive and robust network infrastructure is crucial for providing reliable and high-speed connectivity to all parts of the country.

3. Collaboration with Private Sector:

Partnerships with private telecom operators are essential. Collaborative efforts can leverage the expertise and resources of the private sector to expand network coverage and improve the quality of services.

4. Technological Advancements:

Adopting innovative technologies, such as satellite internet and low-earth orbit (LEO) satellite constellations, can help bridge connectivity gaps, especially in areas where traditional terrestrial infrastructure is challenging to deploy.

5. Digital Literacy and Adoption:

Promoting digital literacy and encouraging the adoption of digital services are critical. Even with connectivity, the benefits of the internet can only be realized if people have the skills and motivation to use digital technologies effectively.

6. Monitoring and Evaluation:

Regular monitoring and evaluation of these schemes are essential to identify gaps and areas that need improvement. Continuous assessment allows policymakers to refine strategies and ensure that the schemes are meeting their objectives.

7. Community Participation:

Engaging local communities in the planning and implementation of these schemes can lead to more tailored solutions that address specific local needs. Community participation fosters a sense of ownership and encourages the sustainable use of digital services.

8. Last-Mile Connectivity:

Ensuring last-mile connectivity is a challenge. Schemes need to focus on the most remote and underserved areas to truly achieve universal connectivity. Special attention to the connectivity needs of tribal regions and geographically isolated areas is crucial.

In summary, while USOF-supported schemes, including BharatNet, are significant steps toward achieving universal connectivity in India, their

sufficiency depends on the factors mentioned above. It requires a holistic approach that combines infrastructure development, technological innovation, community engagement, digital literacy, and continuous evaluation to ensure that the goal of universal connectivity is met effectively and sustainably.

Following Initiatives should be taken apart from the BharatNet :

- The Government of India's Common and Support ICT Infrastructure should be completely utilized by Ministries, Departments, and States. DeitY should also develop/set standards and policy guidelines, give technical and mentoring assistance, and conduct capacity building and R&D, among other things.

- Existing and ongoing e-governance programs should be redesigned to conform with the Digital India concepts. To improve the delivery of government services to citizens, scope enhancement, process reengineering, the use of integrated and interoperable systems, and the implementation of emerging technologies such as cloud and mobile will be conducted.

- States should have the freedom to identify additional state-specific initiatives that are relevant to their socioeconomic needs for inclusion.

- While adopting a decentralized implementation model, e-Government should be promoted through a centralized initiative to the extent necessary, to ensure citizen-centric service orientation,

interoperability of multiple e-Government apps, and optimal utilization of ICT infrastructure/resources.

- Successes should be discovered and proactively pushed for replication, with the necessary productization and customization as needed.

- Wherever possible, public-private partnerships should be used to undertake e-governance projects with proper management and strategic control.

- Adoption of a Unique ID should be encouraged in order to make identification, authentication, and benefit distribution easier.

- The National Informatics Center (NIC) should be restructured to improve IT assistance for all government ministries at the federal and state levels.

- At least ten major ministries should have Chief Information Officers (CIO) roles created so that diverse e-governance projects could be designed, developed, and executed more quickly. CIO roles should be at the level of Additional Secretary/Joint Secretary, with overriding IT authority in each Ministry.

Q.7 What steps should be taken to encourage service providers for effective utilization of the BharatNet infrastructure in provisioning of connectivity to Institutions/households/ individuals?

Comments :

BharatNet, initiated by the Government of India, aims to provide high-speed broadband internet connectivity to rural and remote areas in the country. Telecom service providers (TSPs) can effectively utilize BharatNet by implementing various strategies and best practices:

To ensure effective utilization of BharatNet by Telecom Service Providers (TSPs), the Government of India and the Telecom Regulatory Authority of India (TRAI) can take various steps:

Government Initiatives :

1. **Policy Framework:** Develop clear and supportive policies that encourage private sector participation in BharatNet deployment. Provide incentives for TSPs to invest in infrastructure in underserved rural areas.

2. **Subsidies and Grants:** Offer subsidies or grants to TSPs for setting up infrastructure in remote and economically challenging areas. Financial support can significantly boost the business case for extending services to these regions.

3. **Public-Private Partnerships (PPPs):** Encourage PPPs between the government and private companies. Collaborations can lead to cost-sharing, leveraging the strengths of both sectors for efficient implementation and operation.

4. **Streamlining Approval Processes:** Simplify and expedite the approval processes related to infrastructure deployment. Reduce bureaucratic hurdles, making it easier for TSPs to roll out services in rural areas.

5. **Incentives for Digital Services:** Provide incentives for TSPs offering essential services such as telemedicine, e-education, and e-governance through BharatNet. Subsidies or reduced taxes could encourage TSPs to focus on these critical areas.

6. **Regulatory Support:** Establish regulations that promote fair competition and prevent monopolistic practices. Clear regulations create a level playing field, encouraging more TSPs to participate and innovate.

TRAI's Role :

1. **Market Research:** Conduct research to identify underserved regions. TRAI can provide valuable data to the government and TSPs, highlighting areas where BharatNet implementation is most needed.

2. **Quality of Service (QoS) Standards:** Define and enforce QoS standards for BharatNet services. Regularly monitor TSPs to ensure they adhere to these standards, providing reliable and high-quality services to rural users.

3. **Spectrum Allocation:** Allocate necessary spectrum bands to TSPs for offering broadband services in rural areas. Efficient spectrum allocation can improve network performance and coverage.

4. **Consumer Protection:** Implement regulations that protect consumers in rural areas. Ensure transparent billing, fair tariffs, and mechanisms for dispute resolution to build trust among users.

5. **Capacity Building:** Organize workshops and training programs for TSPs to educate them about the potential of BharatNet and how to effectively utilize the infrastructure. This can promote innovative service offerings.

6. **Monitoring and Reporting:** Establish a monitoring mechanism to track the progress of BharatNet implementation by TSPs. Regular reports can help identify challenges and areas that need additional support.

7. **Encouraging Research and Development:** Provide grants or incentives for TSPs engaging in research and development activities focused on improving rural connectivity solutions and services.

By taking these steps, the government and TRAI can create an enabling environment for TSPs to effectively utilize BharatNet, ensuring that the benefits of digital connectivity reach the farthest corners of the country.

Service Provider's Role :

1. **Infrastructure Development:** TSPs should invest in building last-mile connectivity infrastructure, such as towers and fiber optic cables, to connect the BharatNet network to individual households and businesses in remote areas.

2. **Affordable Service Plans:** TSPs can design affordable and flexible service plans tailored to the economic conditions of rural customers.

These plans should offer a good balance between data volume and cost, making internet services accessible to a larger population.

3. **Localized Content:** Creating and promoting localized content in regional languages can attract more users. TSPs can collaborate with local content creators to develop relevant and engaging content, including educational materials, news, and entertainment.

4. **Digital Literacy Programs:** Educating rural communities about the benefits of the internet and providing basic digital literacy training can enhance digital adoption. TSPs can partner with local NGOs and government agencies to conduct awareness campaigns and training sessions.

5. **Government and NGO Partnerships:** Collaborate with government agencies and non-profit organizations to leverage BharatNet for delivering essential services such as healthcare, education, and e-governance. This can include telemedicine services, online education programs, and government service portals.

6. **Mobile Internet Connectivity:** Enhance mobile internet connectivity in BharatNet-covered areas. Many rural users access the internet through smartphones, so optimizing mobile networks is crucial for a seamless online experience.

7. **Quality of Service:** Ensure a reliable and high-quality internet connection. TSPs must maintain network uptime, low latency, and sufficient bandwidth to deliver a satisfying user experience.

8. **Customer Support:** Establish local customer support centers to address user issues promptly. Providing excellent customer service can enhance customer satisfaction and retention.

9. **Incentives for Digital Entrepreneurs:** Encourage local entrepreneurs to develop digital services and applications. TSPs can offer incentives or support programs to foster the growth of digital startups in rural areas.

10. **Feedback Mechanism:** Establish a feedback mechanism to understand the unique needs and challenges of rural users. Regular surveys and interactions with the community can provide valuable insights for improving services.

11. **Energy Efficiency:** Implement energy-efficient solutions for powering network infrastructure in off-grid areas. Solar-powered cell towers and energy-efficient equipment can reduce operational costs and environmental impact.

12. **Partnerships with Local Businesses:** Collaborate with local businesses to offer online services and e-commerce platforms. This can boost the local economy and create new opportunities for entrepreneurs.

By adopting these strategies, telecom service providers can effectively utilize BharatNet, bridging the digital divide and empowering rural communities with access to the internet and its myriad benefits.

Q.8 Is there any need to take steps to make satellite internet a viable option for providing connectivity to remote/ inaccessible areas? If

yes, please provide your answer with suitable justification. If not, what are the other alternatives for provision of connectivity in these areas?

Comments :

Yes, making satellite internet a viable option for providing connectivity to remote and inaccessible areas is crucial for bridging the digital divide. Here's why it's important and what steps can be taken:

Importance of Satellite Internet Connectivity :

1. **Global Coverage:** Satellite internet can provide connectivity to even the most remote and inaccessible areas, including mountainous regions, islands, and sparsely populated areas where laying traditional internet infrastructure is difficult and costly.

2. **Rapid Deployment:** Satellites can be deployed relatively quickly, making them ideal for emergency situations such as natural disasters where immediate connectivity is essential for communication and coordination.

3. **Scalability:** Satellite internet can scale easily to cover vast and remote regions without the need for extensive physical infrastructure, making it a cost-effective solution for areas with low population density.

4. **Diverse Applications:** Satellite internet supports various applications, including telemedicine, e-learning, precision agriculture, and

environmental monitoring, enhancing the overall development and well-being of remote communities.

Steps to Make Satellite Internet Viable :

1. **Regulatory Support:** TRAI should create regulatory frameworks that facilitate the deployment of satellite internet services. This includes spectrum allocation and licensing processes that encourage satellite service providers to operate in the region.

2. **Financial Support:** Provide subsidies or grants to satellite internet service providers to reduce the initial investment costs. Financial incentives can encourage private companies to invest in satellite infrastructure for remote areas.

3. **Partnerships:** Encourage partnerships between governments, private satellite operators, and non-profit organizations. Collaborative efforts can lead to more efficient use of resources and expertise in deploying satellite internet services.

4. **Promote Research and Development:** Invest in research and development to improve satellite technology, making it more affordable, efficient, and capable of handling high-speed internet connections. This can drive innovation and reduce costs in the long run.

5. **Community Engagement:** Educate and engage local communities about the benefits of satellite internet. Address concerns, provide training, and involve local communities in the deployment process to ensure successful adoption and utilization.

6. **International Collaboration:** Collaborate with international organizations and neighboring countries to explore cross-border satellite internet solutions. Regional cooperation can lead to more comprehensive coverage in border areas.

7. **Monitoring and Evaluation:** Establish mechanisms for monitoring the performance and impact of satellite internet services in remote areas. Regular evaluations can help identify challenges and areas for improvement.

8. **Disaster Preparedness:** Integrate satellite internet solutions into disaster preparedness plans. Having satellite-based communication infrastructure in place can be invaluable during natural disasters and emergencies.

By taking these steps, we can promote the adoption of satellite internet, ensuring that even the most remote and inaccessible areas have access to reliable and high-speed internet connectivity.

Q.9 What measures are required for adopting a collaborative approach to utilize Digital Connectivity Infrastructure created by the service providers or through government-aided schemes to extend connectivity to the people in unserved areas? Please provide your answer with suitable justification.

Comments :

Adopting a collaborative approach to utilize Digital Connectivity Infrastructure (DCI) created by service providers or through government-aided schemes is crucial for extending connectivity to unserved areas. Following are some measures that can facilitate this collaborative effort:

1. Public-Private Partnerships (PPPs):

Encourage PPPs: Facilitate partnerships between government agencies and private service providers to share resources and expertise. Incentives such as tax breaks or reduced regulatory barriers can encourage private investment in unserved areas.

2. Infrastructure Sharing:

Mandatory Infrastructure Sharing: Enforce regulations that mandate infrastructure sharing among service providers. This could include sharing of cell towers, fiber optic networks, and other network elements to reduce costs and expand coverage efficiently.

3. Community Engagement:

Community Involvement: Involve local communities in the planning and implementation process. Community-driven initiatives can identify specific needs and help design targeted connectivity solutions.

4. Government Support:

Subsidies and Grants: Provide subsidies or grants to service providers willing to extend connectivity to underserved or remote areas. Financial support can offset the initial investment costs.

5. Regulatory Support:

Streamlined Regulations: Simplify regulatory processes for obtaining permits, licenses, and clearances in underserved regions. Reduced bureaucracy can attract service providers to invest in these areas.

6. Data-driven Decision Making:

Data Analysis: Use data analytics to identify areas with the highest demand for digital connectivity. Target investments based on data-driven insights to maximize impact.

7. Incentives for Last-Mile Connectivity:

Last-Mile Connectivity Incentives: Provide additional incentives to service providers who focus on establishing last-mile connectivity solutions. The last-mile is often the most challenging and expensive segment to cover.

8. Technology Innovation:

Innovative Solutions: Encourage the development and adoption of innovative technologies, such as low-cost wireless solutions, satellite connectivity, or TV white spaces, to extend connectivity to remote areas.

9. Capacity Building:

Training and Capacity Building: Offer training programs and capacity-building workshops to local communities, enabling them to manage and maintain digital infrastructure effectively.

10. Monitoring and Evaluation:

Performance Monitoring: Establish mechanisms to monitor the performance and impact of digital connectivity initiatives. Regular evaluations can identify successes and areas for improvement.

11. Public Awareness:

Awareness Campaigns: Launch public awareness campaigns to inform local communities about the benefits of digital connectivity. Educated communities are more likely to participate and support such initiatives.

12. Flexible Funding Models:

Flexible Funding: Develop flexible funding models that allow service providers to invest in connectivity projects tailored to the specific needs of each unserved area. One-size-fits-all approaches might not be effective.

13. International Collaboration:

International Collaboration: Collaborate with international organizations and other countries to learn from successful connectivity initiatives. Exchange of knowledge and best practices can inform local strategies.

14. Government-led Initiatives:

Government-Led Projects: Initiate government-led projects to establish digital connectivity infrastructure in unserved areas. These projects can serve as models for private sector involvement and collaboration.

By combining these measures and adopting a collaborative approach that involves governments, service providers, local communities, and international partners, it is possible to extend digital connectivity to

unserved areas effectively and sustainably. Such initiatives can significantly contribute to bridging the digital divide and promoting economic and social development in underserved regions.

Q.10 Please suggest the best practices being followed internationally that can be adopted in the country to provide universal connectivity to all individuals, households, and communities?

Comments :

Strategies associated with enhancing the digital inclusion of women were universally broad in their reach and underpinned by a strategy for gender equality. For example, a reduction in gender inequality is an expected outcome of implementing Italy's National Digital Skills Strategy (that focuses on interventions in higher education and training, the workforce, ICT skills and citizens), and accordingly aligns to the objectives stated in Italy's Gender Equality Strategy 2021.

Similarly, to meet gender equity goals for women in science, technology, engineering, and mathematics (STEM), Argentina created a public-private partnership named the Center of Genders in Technology. One of the strategies of the Center is to co-design and implement transformative learning opportunities that support the pursuit of gender equality, empowerment and generation of rights for women.

Some G20 Members set specific targets for women's digital participation. Türkiye, for example, has a goal to increase the rate of Internet use among women, from 65.5 per cent in 2018 to 90 per cent in 2023, in its Eleventh Development Plan (2019-2023). This will be achieved

by improving digital infrastructure through mobile and fibre broadband in inaccessible regions.

The European Union has set an objective, in the Digital Decade Communication, to achieve at least basic digital skills in a minimum of 80 per cent of the population, by 2030. Currently, 52.3 per cent of women and 55.6 percent of men meet this benchmark. Additionally, this plan aims to train 20 million ICT specialists with gender parity, which is around 10 per cent of the working population. Currently, 4.5 per cent of the working population is employed in ICT jobs, with only 19 per cent of those being women. The Recovery and Resilience Facility supports the achievement of these goals through a €25 billion fund for EU Members. The Digital Europe Programme also supports the creation of additional education programs in advanced digital skills, and the National Coalitions for Digital Skills & Jobs similarly supports training women with advanced digital skills.

Saudi Arabia is working to build a digital system that targets women, embraces, and develops their skills to support the digital transformation process and increases the sustainability of quality work opportunities for them. Saudi Arabia is increasing the proportion of women in ICT jobs, and has a current employment rate of around 30 per cent. Their Women Empowerment program provides training in digital transformation, and thus far, 20,000 women have participated in the program. In addition to the Women Empowerment initiative, Saudi Arabia's Future Skills program trains women and men to build their digital capacities and has resulted in training over 60,000 individuals and placed over 26,000 individuals in work. Their plan is to continue to support STEM graduates for employment

in the ICT industry through promoting entry-level positions, including men in awareness campaigns and mentorship programs, and supporting women leaders. Women's employment support programs also benefit the building of digital skills.

Canada responded to the fall in women's employment resulting from COVID-19 by creating a new Women's Employment Readiness Pilot Program to support women who face multiple barriers. These support programs include learning foundational and transferrable skills (including digital skills), in addition to wrap-around support programs, such as childcare, counselling and transportation. When designing the program, numerous consultations were held with over 20 stakeholder groups that serve and/or represent women who face multiple barriers.

The Republic of Indonesia aims to increase the number of female leaders who utilize technology to increase the incomes from their businesses through their Women in Digital Entrepreneurship initiative. The Ministry of Communications and Informatics also operates the Indonesia Women in Tech: Programming with Python initiative. Similarly, Argentina runs a free online training course named Argentina Codes, with 51 per cent of seats reserved for women. For the participants who progress to the second stage but are not formally employed or are paid below minimum wage, the program provides a financial contribution to buy a new computer and pay for connectivity services and/or public transport.

For children, digital inclusion programs and initiatives that benefit children focus more frequently on the development of skills are

developed. Infrastructure investments, especially in schools and children's education, is also an important policy area.

Digital infrastructure and connectivity :

Devices and connectivity are an important precursor to providing opportunities to develop digital skills. Many countries are investing in digital infrastructure paying particular attention to ensuring that it supports children's education. In China, the Ministry of Education and Ministry of Industry and Information Technology launched a programme, in 2018, to improve access to the Internet in schools. The "Campus Internet Access Action" was aimed at promoting Internet access, increasing connection speed, and reducing fees for schools. By the end of 2021, the Internet access rate of primary and secondary schools (including teaching points) nationwide had reached 100 per cent, and 99.95 per cent of schools have an export bandwidth of more than 100Mbps. Over 210,000 schools have access to wireless Internet, and 99.5 per cent of classrooms in primary and secondary schools are equipped with multimedia equipment.

Brazil, for example, is expanding its telecommunications network into its underserviced Northeast Region via the Northeast Connected Programme. This investment will improve Internet access in schools, universities, businesses, and within communities, and will include free Wi-Fi in public squares. Concurrently, Brazil launched an Internet Brazil Programme in 2022 to provide up to 700,000 mobile phone SIM cards to enable free Internet access to children attending public schools and who belong to families receiving social welfare support. An extension to this

initiative is the Students Connected Project, which facilitates free Internet access to students, from low-income families, who are enrolled in federal universities and vocational education providers.

Similarly, Italy is implementing a National Digital School Plan, alongside its National Digital Strategy, that will provide access to broadband connectivity in all Italian schools. For teachers, the Plan includes strengthening digital skills through training programs and promoting a culture of information security. For students, the Plan aims to certify the acquisition of digital skills and develop responsible awareness of the use of digital tools.

Türkiye recognized that the COVID-19 pandemic had accelerated and heightened the need to make infrastructure investments that facilitate online learning in emergencies. Accordingly, Türkiye has created three initiatives that respond to this challenge, including the Emergency Connectivity and IT Infrastructure for Education in Emergencies, the Digital Content for Safety and Quality, and the Institutional Capacity for Education Technology Resilience. These programs include equity interventions for students most vulnerable to learning losses due to school closures. Türkiye is investing heavily in online learning platforms, including a New Digital Education System, a Digital Education Platform, an Education Information Network, and in certified online trainings for teachers. Furthermore, Türkiye has implemented measures to enhance Internet safety for children. In addition to connectivity, accessibility to devices is important as well. Argentina provides every student in public schools with a netbook computer through their Conectar Igualdad Program. While the program

was initiated in 2010, it distributed 226,253 netbooks essential for home learning in response to the COVID-19-induced home quarantine. This program includes training in the use of computers, a virtual library and resources for teachers. Of all the students that were surveyed, 81.6 per cent reported that their computer skills have improved since they received the netbooks. Furthermore, Argentina initiated a similar program, the AUNAR Program, in 2020, in response to the COVID-19 pandemic. Under this program, children and adolescents, between 6 and 18 years of age who live outside of a family setting, have access to tablets and other devices. Thus far, 9,631 children and adolescents in protection homes and juvenile prisons, and 4,408 children in community homes have benefitted from this program. This device rollout was accompanied by training to caregivers on digital citizenship. In this regard, digital citizenship refers to the set of skills, abilities, and capacities that allow the ability to access, retrieve, understand, evaluate, and use information and content that circulates in the media, social networks, and digital spaces in all formats.

Canada is bridging the digital divide for low-income families via the Connecting Families Initiative. Eligibility for this initiative is for families receiving the Canada Child Benefit. Interestingly, the program is reliant on Internet Service Providers to voluntarily provide low-cost to families (cost saving approximately Can$50 per month), without a government reimbursement or subsidy. In 2022, eligibility was extended to low-income seniors receiving a particular government pension. Recent data shows that nearly 85,000 households have benefitted from the program, and 20 per cent of these households did not have Internet prior to this program. As

this program is reliant on the Internet service providers, their ability to provide access to remote areas is limited due to infrastructure. That is, it is too expensive to provide this program in areas serviced by costly satellite or wireless digital infrastructure. Interim feedback also indicated that data speed was not enough to incentivize participation in the first iteration, but after speeds and data usage were increased, participation showed improvement.

Digital skills and human capacity :

Gamification is important to help engage children in developing their digital skills. Türkiye facilitates the TEKNOFEST Aerospace and Technology Festival in partnership with numerous organizations, as well as with the Maker Labs and Cyber Intelligence Contest for school students. Through the Contest, students who give the highest number of correct answers in the shortest time possible earn surprise gifts and rewards to increase their motivation. Similarly, Saudi Arabia's Future Heroes program encourages the spirit of competition and creativity in technical projects with children up to age 17, and Canada offers children the CanCode program to advance their digital skills.

The European Union encourages children to pursue a career in ICT through the EU Code Week program, which has been ongoing since 2014. It aims at bringing computational thinking and coding to schools, with 4 million students having participated in 2021. EU member States also collaborate, through the National Coalitions for Digital Skills & Jobs, to provide a platform for digital skills resources to help train young adults and provide inspiring stories to kick-start their digital career. The new

Better Internet for Kids Strategy will support EU member States to monitor the impact of digital transformation on children's well-being, develop tools and activities to raise awareness of risks for children as young consumers, and facilitate the exchange of good practices.

Rural communities :

Rural communities are commonly defined by having small population densities, such as the Eurostat definition adopted by Italy of having 'less than 100 inhabitants per square kilometre'. Canada defines rural communities as those having less than 1,000 inhabitants, and Türkiye's definition (provided in their National Rural Development Strategy 2014-2020) refers to communities with less than 20,000 people. Some countries, like Brazil, do not strictly define rural communities, however they have laws relating to agriculture that refer specifically to rural communities and note that sometimes communities in rural areas share common cultural bonds relating to events, traditions, and customs, and are referred to on this basis. Indonesia has regulations regarding 'underdeveloped regions', which are defined based on criteria, such as community economy, human resources, facilities and infrastructure, regional financial capacity, accessibility, and regional characteristics. Broadly, rural communities have limited access to technology, and are accordingly vulnerable cohorts in the context of the digital economy.

Digital infrastructure and connectivity :

Argentina's Plan Conectar, Brazil's Northeast Connected Programme, the Republic of Korea's Joint 5G Network Construction and Sharing Plan, Türkiye's National Rural Development Strategy are all examples of the

enormous investments in digital infrastructure that are currently being deployed. Furthermore, through the National Broadband Strategy and Action Plan (2017-2020) regarding connectivity in rural areas, Türkiye aimed to ensure that broadband services were provided in those residential areas which are described as being rural and where broadband services are not provided through appropriate fixed and wireless technologies, with direct or indirect funding methods. For countries with remote and hard-to-access locations, a multidimensional approach to infrastructure connectivity is likely to reach more households and boost digital inclusion. Common themes in responses relating to digital infrastructure investment are the expansion of fibre-optic networks, satellite networks and enhancement of e-government and cloud services. Canada is investing over Can$ 2.75 billion in high-speed Internet projects for rural and remote communities to meet their goal of connecting 98 per cent of Canadians by 2026, and all Canadians by 2030. Argentina adds investing in digital television broadcast stations as another important agenda item. The United States of America is engaging in a US$ 42.45 billion project to expand high speed Internet access to underserved areas by funding planning, infrastructure deployment and adoption programs in 50 states, including Washington D.C., and in Puerto Rico, the U.S. Virgin Islands, Guam, American Samoa, and the Commonwealth of the Northern Mariana Islands. Australia is currently establishing strategies for improving access, affordability and ability to First Australians (who often live in isolated locations) through their Indigenous Digital Inclusion Plan. This plan is being developed by the National Indigenous Australian Agency and

the government department responsible for infrastructure. The National Indigenous Australian Agency currently oversees remote telecommunications for the indigenous community. 460 small, remote indigenous communities are currently serviced by community payphones, Wi-Fi satellite telephones, and wi-fi hubs.

Digital skills and human capacity :

Improved digital infrastructure simultaneously provides opportunities for rural communities to learn digital skills. The Republic of Korea opened more than 1,000 digital learning centres in 2020/21, named Digital Competency Enhancement Education (Digital Learning Center). The various workshops held in the Centre provided, for example, guidance on how to use digital devises, online marketing, and using Microsoft programs, amongst others. Of the 6.56 million people that participated in the various workshops in 2021, 1.08 million were from rural areas. For two consecutive years, from 2020 to 2021, a total of 1,084,000 people were educated, with 428,000 people in 2020 and 656,000 people in 2021. Among them, 109,000 people belonged to rural communities.

Argentina has similarly built a network of free access points across 23 provinces. The Punto Digital Program has facilitated more than 600 Digital Points, which include a Learning Area, a Cinema area, and an Entertainment area. The Learning Area is equipped with notebooks and/or desktop computers for face-to-face training. These Digital Points became essential during the COVID-19 pandemic to assist citizens with e-government services and for cashing their social assistance payments. As well as expanding physical access spaces, Argentina has a digital training

platform, named the Virtual Learning Platform, with over 100 courses freely available on digital inclusion, gender, job skills, citizenship, and human rights, curated by the Pedagogical Content team.

Argentina- Virtual Learning Platform :

Launched in 2019, Argentina's Virtual Learning Platform (PAV) is a free and open distance training space where people can access over 100 courses relating to digital inclusion, gender, job skills, citizenship, and human rights. The PAV is administered through the Secretariat of Technological Innovation of the Public Sector – Chief Cabinet's Office. In 2021, there were over 500,000 users of the PAV, with over 100,000 people obtaining qualifications through the platform. The top four courses of choice during that year were: digital marketing strategies; gender perspective and gender violence; food and drinks – sanitary best practices; and introduction to digital tools. Accessibility to the program has been maximized through consultation with the National Agency for Disability (ANDIS). One of the key factors for the success of the implementation of the PAV is its accessibility, given that it is available to whoever has a digital device, including a mobile phone or laptop. It was optimized through integration with the Mi Argentina profile, a nationally recognized form of digital identification, and features a 'once-only' principle, where citizens are required to provide certain data to the government just once. The platform was further designed with a range of pedagogical considerations to enhance its value, including the intersection of content which ensured quality of education.

The European Union tracks the level of basic digital skills in regional areas. Currently, only 46 per cent of those who live in predominately rural areas have at least basic digital skills. The EU provides targeted funding for remote regions through the Recovery & Resilience Facility and the Digital Europe Programme. An example is the Promotion of Rural Employment initiative in Spain that received €4.7 billion to promote rural female entrepreneurship, set up a digital skills training centre for rural workers, and provide digital literacy programmes for the unemployed.

Elder generations :

Digital skills and human capacity :

Italy has outlined specific targets in their Digital Civil Service project, dedicated to elder generations. Between 2022 to 2025, they aim to raise the digital skill level of more than 1 million people, belonging to the elder generations cohort, through the engagement of 10,000 young volunteers who will provide digital facilitation and education services. These services will be promoted by NGOs and non-profit organizations. The physical access points will be in libraries, schools and community centres which will provide in-person and online trainings. Increased funding is expected to grow the network from 600 to 3,000 centres.

Similarly, Australia identified that a well-coordinated network would be essential for the success of their Be Connected program for those over 50 years of age. The Department of Social Services works with a network of community organizations who deliver one-on-one, small group, and online learning support all over Australia. The online learning modules include using digital devices, the Internet, and online safety.

Germany is undertaking three projects for the empowerment of digital sovereignty for older people, including the Digital Pact for Old Age, Digital Angel and the BAGSO Service Centre's Digitization and Education for Older People program. Germany regularly reports on older people with the Eighth Government Report on Older People, published in 2020, focusing on the effects of digitization. The Digital Pact for Old Age is a longer-term initiative to strengthen the social participation and the commitment of older people in the digital world through an alliance of the federal government, state government, local authorities, business, science, and civil society.

The Republic of Korea is working to improve the digital skills of its elder generations through its Digital Learning Centres. It is also aiming to grow its senior internship program from 172 participants, in 2021, to 500 participants. Hired senior interns will provide educational support and counselling for their senior counterparts.

Saudi Arabia is working to build the skills of its digitally illiterate citizens through its Attaa Digital program, which aims to raise and enrich Arab technological content. Over 22 million people have benefitted from this program. The Saudi Arabian Tech for All program is more specifically targeted for older individuals and is designed to enable them to use technology to help meet their needs without assistance. Canada's Can$ 29.5 million Digital Literacy Exchange program is similar in that it aims to equip Canadians with the necessary skills to engage with computers, mobile devices, and the Internet safely, securely, and effectively.

Türkiye utilizes existing education infrastructure to deliver courses to people over the age of 60. Known as The Refresher University in Türkiye, and the University of the Third Age more widely, courses for active ageing that include ICT are widely available in Turkish provinces with planned expansions of the campuses. In addition to the free courses that are provided to all participants, there are also digital and financial literacy courses conducted for residents of nursing homes across the country. In these courses, nursing home residents have opportunities to improve their digital skills which they can use to access utilities or other type of services or applications.

Persons living with disabilities :

Digital skills and human capacity :

The Republic of Korea's National Information Education Comprehensive Plan has operated since 1999. Recent additions to this strategy include the utilization of welfare centres to provide information literacy to this vulnerable cohort. Where individuals are not mobile, they provide customized instruction in the residence. Over 1 million people have benefitted from this service and the key to its success has been the public-private partnership with central ministries and 17 metropolitan governments.

Italy lists similar success factors in their Digital Facilitation Services Network program. Identifying opportunities to work with local service providers, such as librarians, operators of employment/senior/social assistance organizations, have been instrumental in rolling out the 600 digital skills learning centres across Italy with 2,400 more in the pipeline.

Indonesia makes sure the effort in the training workshop in their education program, called IT Training Participants for Disabilities, awards graduates with a certificate on completion of the program.

Canada is investing Can$ 298 million in their Skills for Success program which has participation targets for marginalized groups, such as people living with disability, women, indigenous peoples, etc. This program will support 90,000 Canadians with building foundational and transferrable skills to prepare and succeed at work. The program includes digital skills and digital literacy training. Practitioners from all regions of Canada participated in the focus group sessions during the design and consultation phase.

The United States of America is increasing rates and equity of Internet use through the Digital Equity Act, which providers US$ 2.75 billion to establish three grant programs that promote digital equity and inclusion.

Digital Affordability

Q.11 Whether various measures taken by the Government such as focusing on local manufacturing are sufficient to bring down the prices of smartphones in India? If not, what additional measures explain your answer with suitable justification.

Comments :

Reducing smartphone prices in India involves a combination of policy measures, industry initiatives, and market dynamics. Here are several strategies that can contribute to bringing down smartphone prices:

1. Manufacturing Incentives:

Government Incentives: The government can offer incentives, subsidies, and tax breaks to encourage smartphone manufacturing within the country. Initiatives like the "Make in India" campaign promote domestic manufacturing, reducing import costs and creating jobs.

2. Research and Development (R&D) Support:

R&D Investments: Encourage smartphone manufacturers to invest in R&D in India. Research and innovation can lead to the development of cost-effective technologies and components.

3. GST Rationalization:

Taxation: Rationalize Goods and Services Tax (GST) on smartphones and related components. Lowering tax rates can reduce the final retail price for consumers.

4. Reduction in Import Duties:

Import Duties: Reduce import duties on key smartphone components. Lower duties decrease manufacturing costs and, consequently, the final product price.

5. Local Manufacturing Ecosystem:

Supplier Ecosystem: Strengthen the local manufacturing ecosystem by encouraging the establishment of component suppliers and manufacturers. A robust local supply chain reduces dependence on imports.

6. Bulk Purchase Agreements:

Government Procurement: The government can negotiate bulk purchase agreements for smartphones, ensuring a steady market for manufacturers and potentially reducing prices for consumers.

7. Innovation and Competition:

Promote Innovation: Encourage smartphone manufacturers to innovate and introduce competitive features at various price points. Healthy competition often leads to better products at lower prices.

8. Promotion of Local Brands:

Support Local Brands: Promote and support indigenous smartphone brands. Local brands often offer competitive pricing and can benefit from government initiatives and partnerships.

9. Digital Literacy and Adoption:

Promote Digital Literacy: Invest in digital literacy programs to increase smartphone adoption. As the user base grows, manufacturers can achieve economies of scale, allowing for reduced costs.

10. E-Waste Management:

Efficient E-Waste Management: Implement efficient e-waste management systems to reduce disposal costs. Lower environmental compliance costs can contribute to reduced prices.

11. Infrastructure Development:

Infrastructure Improvement: Invest in infrastructure such as roads and ports to facilitate the movement of raw materials and finished products. Efficient logistics reduce operational costs.

12. Consumer Awareness:

Consumer Education: Educate consumers about different smartphone models, specifications, and features. Informed consumers can make better purchasing decisions, encouraging manufacturers to offer competitive prices.

13. Streamlined Regulations:

Regulatory Simplification: Simplify regulatory processes related to smartphone certification and approvals. Streamlining bureaucratic procedures reduces time-to-market and operational expenses.

14. Industry Collaboration:

Industry-Government Collaboration: Foster collaboration between industry stakeholders and the government. Joint initiatives can address challenges collectively and drive down costs.

15. International Partnerships:

International Collaboration: Collaborate with foreign governments and organizations to explore partnerships, technology transfer, and knowledge exchange that can enhance local manufacturing capabilities.

By implementing a combination of these strategies, the government, smartphone manufacturers, and other stakeholders can work together to

make smartphones more affordable for the masses, fostering digital inclusion and economic growth.

Q.12 Whether market for second-hand smartphones is a viable strategy for increasing the affordability of smartphones to the people? Please indicate the opportunities and challenges that may arise due to this strategy.

Comments : Yes.

The market for second-hand smartphones can be a viable strategy for increasing the affordability of smartphones, especially in emerging economies like India. Here are several reasons why the second-hand smartphone market is beneficial:

1. Affordability:

Cost-Effective: Second-hand smartphones are significantly cheaper than new ones, making them accessible to individuals with limited budgets, especially in developing countries.

2. Digital Inclusion:

Wider Access: Second-hand smartphones enable a larger segment of the population to afford digital devices, promoting digital inclusion and access to online services.

3. Environmental Sustainability:

Reduced E-Waste: Extending the lifespan of smartphones by selling them second-hand reduces electronic waste. Reusing devices is environmentally friendly and promotes sustainability.

4. Upgrading Cycles:

Faster Upgrades: People who can afford second-hand smartphones can upgrade more frequently, ensuring they have access to more recent technology even if it's not the latest model.

5. Local Economy Boost:

Economic Activity: The second-hand smartphone market creates economic activity, providing opportunities for local retailers and repair shops, thus contributing to the local economy.

6. Reduced Entry Barriers:

Lower Entry Cost for New Users: For individuals who are new to smartphones, the lower cost of second-hand devices provides a lower entry barrier, encouraging smartphone adoption.

7. Extended Product Lifecycle:

Maximizing Use: Second-hand markets maximize the use of smartphones, ensuring they stay in circulation longer before becoming e-waste.

8. Choice and Variety:

Diverse Options: Second-hand markets offer a wide range of smartphone models, allowing consumers to choose from various options within their budget.

9. Training and Skills Development:

Repair and Maintenance: The second-hand market provides opportunities for individuals to learn repair and maintenance skills, enhancing local technical expertise.

10. Economic Circulation:

Spending Power: Individuals who buy second-hand smartphones often spend the money they saved on other goods and services, stimulating economic circulation.

11. Refurbished Market:

Certified Refurbished Devices: The sale of certified refurbished devices, which are thoroughly tested and certified by manufacturers, provides a reliable option for buyers.

12. Consumer Empowerment:

Choice and Negotiation: Second-hand markets empower consumers by offering them the flexibility to negotiate prices and choose devices based on their specific needs.

However, it's important to note that ensuring the quality and functionality of second-hand smartphones is crucial. Governments and TRAI can play a role in implementing standards and regulations to protect consumers and promote fair trade practices within the second-hand smartphone market. Consumer education about potential risks and how to make informed purchases is also essential to the success of this strategy.

Q.13 Whether schemes undertaken by various states for distribution of smartphones and laptops to students and support for the connectivity are effective mechanisms to increase Digital Affordability in the country? If yes, what are the measurable parameters to assess the effectiveness of such schemes? If not, what could be the alternative policy interventions/ schemes with measurable outcomes that can support affordability of the devices? Please support your answers with suitable information.

Comments :   Yes.

Schemes undertaken by various states for the distribution of smartphones and laptops to students, along with support for connectivity, can be effective mechanisms to increase digital affordability and promote digital inclusion in a country. Here are several reasons why these schemes can be beneficial:

1. Educational Access:

Equal Educational Opportunities: Providing students with digital devices ensures equal access to educational resources and online learning materials, bridging the digital divide between urban and rural areas.

2. Digital Literacy:

Early Exposure: Introducing students to digital devices at an early age enhances digital literacy, a crucial skill in the modern world.

3. Skill Development:

Technology Skills: Access to smartphones and laptops allows students to develop essential digital skills, preparing them for the job market and future career opportunities.

4. Online Learning:

E-Learning Platforms: Students can benefit from online classes, educational apps, and digital libraries, enhancing their learning experience beyond traditional classroom settings.

5. Connectivity Support:

Internet Access: Providing support for internet connectivity ensures that students can access online resources, participate in virtual classrooms, and engage in research activities.

6. Reduction of Educational Disparities:

Addressing Disparities: Such schemes address educational disparities by ensuring that students from economically disadvantaged backgrounds have access to the same educational tools as their more privileged counterparts.

7. Empowering Students:

Empowerment: Equipping students with digital devices empowers them to explore a wide range of subjects, cultivate creativity, and engage in self-directed learning.

8. Government Initiatives:

Government Commitment: Government-led initiatives demonstrate a commitment to education and digital inclusion, encouraging other sectors to invest in similar programs.

9. Preparation for Future Challenges:

Technological Competency: Familiarity with digital devices prepares students for a future where digital skills are essential for various aspects of life and work.

10. Support for Online Examinations:

Exam Accessibility: With the proliferation of online examinations, students with access to digital devices can participate in these exams, expanding their educational opportunities.

11. Social and Economic Impact:

Economic Growth: Educated individuals contribute to economic growth, and providing digital tools enhances their educational outcomes, leading to better career prospects and economic stability.

12. Digital Citizenship:

Responsible Use: Early exposure to digital devices allows students to develop responsible digital citizenship, learning about online etiquette, privacy, and security.

However, for these schemes to be effective, it's crucial to ensure the quality and durability of the devices distributed. Additionally, ongoing support, including technical assistance and digital literacy training, can

enhance the impact of these initiatives. Regular evaluation and feedback mechanisms are also important to measure the effectiveness of these programs and make necessary improvements.

Evaluating the effectiveness of schemes aimed at distributing smartphones and laptops to students, along with support for connectivity, requires assessing various measurable parameters. These parameters can provide insights into the impact of these initiatives on digital affordability and inclusion. Here are some key measurable parameters to consider:

1. Device Distribution Metrics:

Device Reach: The percentage of eligible students who received smartphones or laptops.

Device Quality: Assess the specifications and quality of distributed devices to ensure they meet educational requirements.

Device Utilization: Measure how actively students use the distributed devices for educational purposes.

2. Connectivity Support:

Internet Connectivity: Determine the percentage of students with access to internet connectivity through government-supported initiatives.

Reliability: Assess the reliability and consistency of the provided internet connections for educational use.

3. Educational Impact:

Digital Literacy: Evaluate the improvement in digital literacy skills among students who received devices and connectivity support.

Learning Outcomes: Measure academic performance and learning outcomes of students who have access to digital resources compared to those who do not.

Access to Educational Content: Determine the availability and accessibility of educational content through online platforms and digital libraries.

4. Teacher and Parent Engagement:

Teacher Training: Assess the level of training provided to teachers to effectively integrate digital resources into their teaching methods.

Parental Involvement: Evaluate the involvement of parents in supporting their children's digital learning, including their understanding of digital tools and resources.

5. Usage Patterns:

Frequency of Use: Measure how often students use digital devices for educational purposes, both inside and outside the classroom.

Types of Activities: Analyze the types of educational activities students engage in using digital devices, such as online research, interactive learning apps, or virtual classrooms.

6. Infrastructure Improvement:

Availability of Facilities: Assess improvements in educational infrastructure, such as the availability of computer labs and internet connectivity in schools and colleges.

Effect on Dropout Rates: Investigate whether the availability of digital resources reduces dropout rates and improves student retention.

7. Digital Inclusion and Equity:

Closing the Digital Divide: Evaluate the extent to which these initiatives bridge the digital divide by providing equal access to digital resources among urban and rural students and across socioeconomic backgrounds.

Gender Disparities: Assess the impact on reducing gender disparities in digital access and usage among students.

8. Economic Impact:

Job Readiness: Measure the impact of digital education on students' job readiness, including skills relevant to the digital job market.

Entrepreneurship: Evaluate initiatives encouraging digital entrepreneurship among students, fostering innovation and economic growth.

9. Feedback and Satisfaction:

Student and Teacher Feedback: Gather feedback from students and teachers about the effectiveness and usability of the distributed devices and connectivity support.

Parental Perception: Survey parents to understand their perception of the impact of digital education on their children's learning experiences.

10. Long-Term Impact:

Alumni Success: Track the achievements of students who benefited from these initiatives after completing their education, including their careers and contributions to society.

Community Development: Assess the impact on local communities in terms of economic growth and social development facilitated by an educated workforce.

By analyzing these measurable parameters, policymakers, educators, and stakeholders can gain valuable insights into the effectiveness of schemes aimed at increasing digital affordability and inclusion in the country. Regular evaluations and data-driven decision-making are essential to continuously improve these initiatives and ensure their long-term impact.

Q.14 Is there any need for policy interventions to increase Digital Affordability (digital devices and digital connectivity) among specific sections of society, for example, women, students, farmers, fishermen, economically weak, etc.? Please respond with suitable justification.

Comments :   Yes.

The digital transformation offers immense opportunities for economies and societies. However, the benefits of the digital transformation are currently not equally balanced between societal groups and genders and access, use and ownership of digital tools are not gender-neutral. The term "digital gender divide" is frequently used to refer to these types of gender differences in resources and capabilities to access and effectively utilize ICTs within and between countries, regions, sectors and socio-economic groups (see UN Women, 2005). There are a number of root causes of the digital gender divide, including hurdles to access, affordability, education (or lack thereof) and lack of technological literacy, as well as inherent biases and socio-cultural norms that lead to gender-based digital exclusion (OECD, 2018d; OECD, 2015a; Hilbert, 2011; Cooper, 2006; Korupp and Szydlik, 20050F 1). Women were found to do 2.6 times the amount of unpaid care and domestic work that men do, which leaves them less times to grow their careers (UN Women, 2018a).

There is a recognition that action is needed across diverse areas to ensure all women and girls can fully participate in the online world, with a recent Broadband Commission Working Group on Digital Gender Divide proposing several recommendations, including around digital literacy and confidence, and the availability of relevant content, applications and services (Broadband Commission, 2017a). Skills, skill endowment and skill demand also play a fundamental role in determining, and limiting, the digital gender divide.

Another reason why fewer women than men use digital tools is the lack of awareness of the potential benefits that the Internet may bring. Women are significantly more likely than men to not use the Internet because they think they "do not need it" or they "do not want it" (Fallows, 2005). Intel and Dalberg (2012) find that 25% of the women who do not engage online are generally not interested in using the Internet, and almost all of them believe that accessing the Internet would not bring them any benefit. Evidently, lack of trust in digital devices or the Internet may also play a role, despite women mainly reporting lack of interest or having low expectations about its usefulness and relevance to their local context (i.e. lack of use of local languages). Illiteracy further hinders women's and girls' ability to access online services. About 83% of women worldwide are literate, compared to 90% of men (UNESCO, 2017), and illiterate women only appear to be using online platform services, such as Skype and YouTube, that are more familiar to them or are easier to access and use. To try and address this hurdle, some search engines, such as Google, have installed voice navigation systems in local languages to make Internet search queries more accessible and inclusive. The digital gender divide is also fuelled by digital illiteracy, which often translates in lack of comfort in using technology and accessing the Internet. Such "technophobia" is often a result of concurrent factors including education, employment status and income level. For instance, Intel and Dalberg's (2012) survey shows that more than half of the women having no formal education said they were not familiar or comfortable with the technology.

However, this percentage fell to 15% in the case of women with at least high school education.

Digital technologies have immense potential and can improve people's economic and social outcomes in multiple ways. But while about half of the world's population is now connected to networks, and businesses seem almost unable to run without the use of some ICTs, this growth in connectivity has not been enjoyed by everyone equally. A digital gender divide emerges, which has a number of root causes. Among them, hurdles to access, affordability, education (or lack thereof) and lack of technological literacy, as well as inherent biases and socio-cultural norms leading to gender-based digital exclusion, rank among the most important.

Increasing digital affordability among specific sections of society, such as women, students, farmers, fishermen, and economically weak individuals, requires targeted policy interventions aimed at addressing the unique challenges faced by each group. Here are some policy recommendations that can help promote digital affordability and inclusivity:

1. Subsidized Digital Devices:

Targeted Subsidies: Provide targeted subsidies on digital devices (such as smartphones, tablets, and computers) for specific groups like students, farmers, and economically disadvantaged individuals.

Government-Backed Financing: Facilitate access to low-interest or no-interest loans for purchasing digital devices, especially for women entrepreneurs and small-scale farmers.

Device Recycling Programs: Implement programs that encourage the recycling and refurbishment of old digital devices, making them accessible at lower costs.

2. Affordable Connectivity:

Subsidized Internet Plans: Collaborate with internet service providers to offer subsidized data plans for specific demographics, ensuring affordable and reliable internet connectivity.

Community Wi-Fi Initiatives: Establish community-based Wi-Fi initiatives in rural areas to provide affordable internet access to farmers and fishermen.

Zero-Rated Services: Provide free access to essential services like educational platforms, agricultural information, and healthcare websites, encouraging digital adoption among various groups.

3. Digital Literacy and Training:

Training Programs: Develop digital literacy programs tailored to specific groups, teaching essential digital skills to farmers, fishermen, women, and economically weak individuals.

Local Language Content: Create digital training content in local languages to ensure better understanding and adoption, especially among rural populations.

Collaboration with CAGs: Partner with non-governmental organizations (CAGs) and community organizations to conduct digital literacy workshops and training sessions.

4. Accessible Government Services:

Digitalization of Public Services: Ensure that essential public services are accessible online, making it necessary for citizens to adopt digital practices.

Assisted Digital Service Centers: Establish centers equipped with digital devices and personnel who can assist individuals in availing online government services.

5. Financial Inclusion:

Digital Payment Literacy: Educate individuals about digital payment methods, enabling them to participate in the digital economy.

Subsidized Transaction Fees: Encourage banks and financial institutions to lower or eliminate transaction fees for digital payments made by specific groups, making digital transactions more attractive.

6. Public-Private Partnerships:

Collaboration with Private Sector: Partner with private companies to provide discounts on digital devices, internet plans, and digital services for specific target groups.

Corporate Social Responsibility (CSR) Initiatives: Encourage private companies to invest in digital inclusion projects as part of their CSR initiatives, focusing on specific communities and demographics.

7. Research and Data Collection:

Data-Driven Interventions: Conduct surveys and research to identify specific barriers faced by different demographic groups. Use this data to tailor interventions for maximum impact.

Regular Impact Assessment: Continuously assess the impact of digital affordability initiatives to identify successful strategies and areas for improvement.

8. Infrastructure Development:

Last-Mile Connectivity: Invest in expanding internet infrastructure to remote and underserved areas, ensuring last-mile connectivity for all communities.

Power Supply: Ensure consistent power supply, especially in rural areas, to support the use of digital devices and services.

9. Gender-Specific Initiatives:

Women Empowerment Programs: Implement initiatives that specifically target women, providing them with digital skills training, access to microloans for digital devices, and support for online entrepreneurship.

Gender-Responsive Content: Create digital content that addresses the specific needs and interests of women, encouraging their participation in the digital space.

10. Regulatory Support:

Incentives for Service Providers: Provide regulatory incentives to internet service providers who offer affordable and inclusive services to marginalized communities.

Regulatory Flexibility: Be open to innovative solutions, such as community networks, that can provide affordable internet access in remote areas.

By combining these policy interventions, governments and relevant stakeholders can work towards increasing digital affordability and ensuring that digital connectivity and devices are accessible to all sections of society, thereby fostering digital inclusion and socioeconomic development.

Q.15 What measures should be taken to make digital devices and digital connectivity affordable to the citizens for empowering them to maximize the benefits of an inclusive digital society? Please provide your answer with best practices being followed internationally in this regard.

Comments :

Several best practices are followed internationally to make digital devices and digital connectivity affordable for citizens, empowering them

to maximize the benefits of an inclusive digital society. Here are some key strategies and practices:

1. Subsidized Devices:

Government Subsidies: Governments provide subsidies or financial assistance to make digital devices, such as smartphones and tablets, more affordable, especially for low-income individuals.

Discounted Devices for Students: Special programs are implemented to offer discounted or subsidized devices to students, enabling them to access online education resources.

2. Affordable Connectivity:

Government Subsidies for Internet Access: Governments subsidize internet access costs, making broadband and mobile data plans more affordable for citizens.

Community Networks: Establish community networks in rural and underserved areas, providing affordable and localized internet access to residents.

3. Digital Literacy and Training:

Free or Low-Cost Digital Skills Training: Governments and NGOs offer free or low-cost digital literacy programs to teach essential digital skills to citizens, ensuring they can use digital devices and services effectively.

Community Digital Literacy Centers: Establish digital literacy centers in communities, providing access to training resources and support.

4. Zero-Rating Services:

Zero-Rated Platforms: Collaborate with telecom operators to provide access to specific essential services (e.g., educational platforms, government websites) without data charges, making these services effectively free for users.

5. Regulatory Measures:

Price Regulations: Regulatory authorities monitor and regulate the prices of internet services and data plans to prevent monopolistic pricing, ensuring affordability for consumers.

Incentives for Telcos: Provide incentives to telecommunication companies to offer affordable data plans and invest in infrastructure in underserved areas.

6. Digital Inclusion Initiatives:

Inclusive Policies: Formulate policies that specifically focus on digital inclusion, ensuring that marginalized communities, rural areas, and persons with disabilities are included in the digital transformation process.

Targeted Subsidies: Implement targeted subsidy programs for specific demographics, such as low-income families, elderly citizens, or individuals with disabilities.

7. Public-Private Partnerships:

Public-Private Collaboration: Encourage collaboration between governments, private sector companies, and NGOs to develop affordable digital solutions, ensuring a coordinated effort to bridge the digital divide.

Corporate Social Responsibility (CSR) Initiatives: Encourage private companies to invest in digital inclusion projects as part of their CSR initiatives, focusing on affordability and accessibility.

8. E-Government Services:

Online Government Services: Expand online government services to reduce administrative costs and enhance citizen access to essential services without the need for physical presence, saving time and resources for citizens.

Mobile-Based Government Services: Develop mobile applications for accessing government services, making it convenient and affordable for citizens, especially in remote areas.

9. Research and Data-Driven Decision Making:

Data-Driven Policies: Use research and data analysis to identify areas with low digital adoption and formulate policies and initiatives targeting these areas specifically.

Regular Impact Assessment: Continuously assess the impact of digital inclusion initiatives to identify successful strategies and areas for improvement.

10. Global Funding and Support:

International Aid and Grants: Seek international funding and support from organizations like the World Bank and UN agencies to finance digital inclusion projects, especially in developing nations.

By implementing these best practices and tailoring them to the specific needs and challenges of each region or community, countries can significantly enhance digital affordability and empower citizens to participate fully in the digital economy and society.

Digital Literacy

Q.16 What measures should be taken to engage the industry and academia in promoting Digital Literacy in India? Please provide your answers with suitable justification.

Comments :

Engaging the industry and academia in promoting digital literacy in India is crucial for the successful implementation of digital literacy initiatives. Here are several measures that can be taken to foster collaboration between industry, academia, and government bodies:

1. Collaborative Research and Development:

Research Grants: Provide grants and funding to academic institutions for research projects related to digital literacy, encouraging collaboration between academics and industry experts.

Joint Research Centers: Establish joint research centers where industry professionals and academics can collaborate on research projects focused on digital literacy and technology accessibility.

2. Curriculum Development:

Industry-Relevant Curricula: Work with industry experts to develop curricula that are aligned with the current needs of the digital industry. This ensures that students are learning skills that are directly applicable in the workforce.

Skill-Based Training: Design courses and training programs that focus on practical, hands-on digital skills that are essential for the industry, such as digital marketing, programming, and data analysis.

3. Industry Mentorship Programs:

Internship Opportunities: Facilitate internships and industry exposure for students, allowing them to gain practical experience and insights into the digital workplace.

Mentorship Programs: Establish mentorship programs where industry professionals mentor students, providing guidance and real-world perspectives on digital careers.

4. Continuing Education and Training:

Workshops and Webinars: Organize workshops, webinars, and seminars led by industry experts to update educators and students about the latest trends, tools, and practices in the digital landscape.

Certification Programs: Collaborate with industry organizations to offer certification programs that validate digital skills. These certifications can enhance the employability of students.

5. Public-Private Partnerships:

Skill Development Initiatives: Collaborate with private companies on skill development initiatives. Companies can provide expertise, infrastructure, and resources for digital literacy programs.

Funding Support: Encourage private companies to invest in digital literacy projects through corporate social responsibility (CSR) initiatives, grants, or sponsorships.

6. Industry-Driven Competitions:

Hackathons and Coding Challenges: Organize coding competitions, hackathons, and digital innovation challenges sponsored by industry players. These events promote creativity and problem-solving skills among students.

Digital Marketing Competitions: Host digital marketing competitions where students can apply their skills in real-world marketing scenarios, encouraging creativity and strategic thinking.

7. Online Learning Platforms:

Industry-Provided Content: Encourage industry professionals to create and share educational content on digital platforms. Industry-led courses can provide practical insights and examples.

Access to Resources: Provide students and educators with free or discounted access to premium online learning platforms that offer industry-relevant courses.

8. Government Initiatives:

Policy Support: Implement policies that incentivize industry-academia collaboration, such as tax benefits or recognition for companies actively engaged in digital literacy initiatives.

Funding and Grants: Allocate government funds and grants to support joint projects between academia and industry aimed at promoting digital literacy.

9. Evaluation and Feedback:

Regular Feedback Loops: Establish mechanisms for continuous feedback from industry partners regarding the skills and competencies of graduates. Use this feedback to update curricula and training programs.

Performance Metrics: Define clear metrics to evaluate the effectiveness of digital literacy programs. Industry input can provide valuable insights into the key skills that need to be assessed.

10. Awareness Campaigns:

Collaborative Campaigns: Launch joint awareness campaigns involving industry leaders, academic institutions, and government bodies to promote the importance of digital literacy and the available educational resources.

Community Engagement: Organize workshops and seminars in local communities to educate people about the benefits of digital literacy and the opportunities it can create.

By fostering collaboration between industry and academia through these measures, India can create a skilled workforce equipped with digital literacy, ensuring that individuals are prepared for the challenges and opportunities of the digital age.

Q.17 How can the digital literacy toolkits developed by multiple industry players already available in the market be utilized to improve digital literacy levels in the country, especially for the rural citizens of the country?

Comments :

Leveraging digital literacy toolkits developed by industry players can be instrumental in improving digital literacy levels in India, especially among rural citizens. Here are several ways these toolkits can be utilized effectively:

1. Localized Content Creation:

Translation and Localization: Translate the content of digital literacy toolkits into regional languages commonly spoken in rural areas. Localize the content to make it culturally relevant and relatable to rural communities.

Customization for Rural Context: Tailor the content to address the specific needs and challenges faced by rural citizens, such as agricultural practices, healthcare, and government schemes relevant to rural areas.

2. Community-Based Digital Literacy Workshops:

Collaboration with CAGs and Community Organizations: Partner with CAGs and local community organizations to organize digital literacy workshops in rural villages.

Mobile Digital Literacy Vans: Implement mobile digital literacy vans equipped with computers and internet connectivity, traveling to different rural areas to conduct on-the-ground training sessions.

3. Integration with Educational Programs:

School Curriculum Integration: Work with educational authorities to integrate digital literacy modules into school curricula, ensuring that students in rural areas receive digital education from an early age.

Adult Education Centers: Collaborate with adult education centers in rural communities, providing digital literacy training to adults who might have missed out on formal education.

4. Digital Literacy Ambassadors:

Local Trainers: Train local individuals as digital literacy ambassadors who can further disseminate knowledge within their communities. These ambassadors can be teachers, community leaders, or volunteers.

Incentivize Participation: Provide incentives, such as certificates or recognition, to motivate individuals in rural areas to become digital literacy trainers.

5. Access to Digital Literacy Tools:

Access to Devices: Ensure that rural communities have access to devices such as smartphones and computers for hands-on practice. Collaborate with industry players to provide subsidized devices for rural citizens.

Internet Connectivity: Address the issue of internet connectivity in rural areas. Work with telecom companies to expand network coverage and provide affordable internet plans.

6. Online Learning Platforms:

Free Access to Toolkits: Collaborate with industry players to provide free access to digital literacy toolkits on online learning platforms. Ensure that these platforms are easily accessible and user-friendly for individuals with varying levels of digital proficiency.

Offline Access: Create offline versions of digital literacy content that can be distributed via USB drives or local networks, allowing individuals in areas with limited internet access to benefit from the resources.

7. Promotion and Awareness:

Awareness Campaigns: Conduct awareness campaigns in rural areas to inform citizens about the availability of digital literacy toolkits, emphasizing the benefits of digital skills for personal and community development.

Interactive Learning: Develop interactive and engaging content within the toolkits, such as videos, quizzes, and games, to enhance the learning experience and keep users engaged.

8. Regular Evaluation and Improvement:

Feedback Mechanisms: Establish mechanisms for users to provide feedback on the digital literacy toolkits. Use this feedback to continuously improve the content and address the specific needs of rural learners.

Partnership with Research Institutions: Collaborate with research institutions to conduct studies and assessments to measure the effectiveness of digital literacy programs in rural areas, guiding future initiatives.

By effectively utilizing these digital literacy toolkits and implementing tailored, community-driven initiatives, we can significantly enhance digital literacy levels in rural areas, empowering citizens to participate meaningfully in the digital economy and society.

Q.18 Please suggest the best practices followed internationally that can be adopted in the country to promote mass digital literacy for different segments of society.

Comments :   **Mentioned in Q. 10.**

Digital Public Infrastructure

Q.19 What steps should be taken to monitor the impact of DPIs on underserved and vulnerable segments of the society? Kindly

indicate the key parameters that need to be monitored to assess such impact and actions required to promote adoption citizen centric services by these segments of the society.

Comments :

Monitoring the impact of Digital Public Infrastructures (DPIs) on underserved and vulnerable segments of society is crucial to ensuring that these initiatives are effective and inclusive. Here are the steps that should be taken to monitor their impact effectively:

1. Define Clear Objectives:

Clear Goals: Define specific, measurable, and time-bound objectives for DPIs, especially concerning their impact on underserved and vulnerable populations. Goals should be aligned with the broader objectives of digital inclusion and socioeconomic development.

2. Data Collection and Analysis:

Baseline Data: Collect baseline data on digital access, skills, and socioeconomic status of the target populations before implementing DPIs. This data provides a reference point for measuring changes over time.

Impact Indicators: Identify key performance indicators (KPIs) related to digital literacy, internet access, employment opportunities, healthcare, education, and other relevant areas. Regularly collect and analyze data on these indicators.

3. User Surveys and Feedback:

User Surveys: Conduct regular surveys among underserved and vulnerable communities to gather feedback on their experience with DPIs. Understand challenges faced, user satisfaction, and suggestions for improvement.

Focus Group Discussions: Organize focus group discussions and qualitative interviews to delve deeper into the impact of DPIs, capturing nuanced insights and stories from the beneficiaries.

4. Digital Skills and Usage Patterns:

Assess Digital Skills: Implement assessments to measure the improvement in digital skills among the target population. Track their ability to use digital tools effectively for various purposes.

Usage Patterns: Analyze data on how underserved communities are utilizing digital services. Understand what services are most used and how they contribute to their daily lives.

5. Partnership with Research Institutions:

Collaborate with Research Institutions: Partner with academic and research institutions to conduct in-depth studies on the impact of DPIs. These studies can provide valuable insights through rigorous research methodologies.

6. Regular Impact Assessments:

Scheduled Assessments: Plan and conduct regular impact assessments at defined intervals (e.g., annually or biennially). Assessments should cover a

wide range of indicators and include both quantitative and qualitative data.

7. Incorporate User Stories:

User-Centric Approach: Incorporate user stories and testimonials into impact assessments. Real-life examples humanize the impact of DPIs and provide context to data.

8. Engage Community Leaders and CAGs:

Community Involvement: Engage community leaders and CAGs in the monitoring process. They can provide valuable input, facilitate communication, and help gather community perspectives.

9. Regular Reporting and Transparency:

Transparent Reporting: Publish regular reports on the impact of DPIs, sharing findings, successes, challenges, and future plans. Transparency builds trust and accountability among stakeholders.

10. Adaptation and Improvement:

Adaptive Strategy: Use the monitoring data to adapt DPI strategies. Identify what works well and replicate successful initiatives. Similarly, identify areas of improvement and make necessary adjustments.

11. Policy Feedback:

Policy Recommendations: Use the findings to provide feedback to policymakers. Recommendations grounded in data can influence policies,

ensuring that they are better aligned with the needs of underserved communities.

12. Long-Term Sustainability:

Sustainability Planning: Evaluate the long-term sustainability of DPIs. Develop strategies to ensure that the benefits are sustainable beyond the initial implementation phase.

By implementing these steps, governments, organizations, and policymakers can effectively monitor the impact of Digital Public Infrastructures on underserved and vulnerable segments of society, ensuring that these initiatives genuinely contribute to digital inclusion, social equity, and overall development.

Emerging Technology driving Digital Inclusion

Q.20 How can emerging technology be leveraged to enhance the digital literacy programmes of the Government? Please give your input with reasons. Best practices being followed by other countries and private sector may also be referred to.

Comments :

Emerging technologies offer innovative solutions to enhance digital literacy programs and make them more effective, engaging, and accessible. Here's how the government can leverage these technologies to enhance digital literacy initiatives:

1. Online Learning Platforms:

Interactive Modules: Develop interactive online modules using augmented reality (AR) and virtual reality (VR) technologies. These immersive experiences can simulate real-life situations, making learning more engaging.

Gamification: Gamify digital literacy programs by incorporating game elements, challenges, and rewards. Gamified learning encourages active participation and motivation among learners.

2. Mobile Apps and Chatbots:

Mobile Apps: Create mobile apps that offer digital literacy courses, practice exercises, and tutorials. Mobile apps ensure accessibility, allowing users to learn at their convenience.

Chatbots: Implement AI-powered chatbots to provide instant assistance and guidance to learners. Chatbots can answer questions, offer explanations, and provide personalized learning recommendations.

3. AI and Personalized Learning:

Personalized Learning Paths: Use artificial intelligence (AI) algorithms to analyze learners' progress and preferences. Customize learning paths and content based on individual needs, ensuring a tailored learning experience.

Adaptive Assessments: Develop adaptive assessments that adjust difficulty levels based on learners' performance, ensuring that learners are challenged at an appropriate level.

4. Digital Storytelling and Videos:

Digital Storytelling: Encourage learners to create digital stories, blogs, or videos about their digital literacy journey. Digital storytelling enhances communication skills and boosts confidence in using digital platforms.

Video Tutorials: Provide instructional video tutorials and live-streamed sessions. Visual learning enhances understanding, especially for complex concepts.

5. Blockchain for Certifications:

Blockchain Certifications: Use blockchain technology to issue digital certifications for completed digital literacy courses. Blockchain ensures the security and authenticity of certifications, allowing employers to verify learners' skills easily.

6. Remote Learning and Virtual Classrooms:

Virtual Classrooms: Set up virtual classrooms and webinars for remote learning opportunities. Virtual classrooms facilitate live interactions, discussions, and Q&A sessions, enhancing the learning experience.

Webinars and Workshops: Conduct webinars and workshops with industry experts to provide real-world insights and experiences to learners.

7. Accessibility Tools:

Accessibility Features: Incorporate accessibility features such as screen readers, subtitles, and voice commands to make digital literacy programs accessible to individuals with disabilities.

Multilingual Support: Provide multilingual support, ensuring that learners can access content in their preferred language.

8. Data Analytics and Insights:

Data Analytics: Utilize data analytics to track learners' progress, identify learning patterns, and assess the effectiveness of different modules. Data-driven insights can inform program improvements.

Predictive Analytics: Use predictive analytics to identify potential dropouts or learners who need additional support. Early intervention strategies can be implemented to retain learners.

9. Collaboration with Tech Companies:

Industry Collaboration: Collaborate with technology companies to access their emerging technologies and expertise. Public-private partnerships can enhance the scope and quality of digital literacy initiatives.

10. Community Engagement:

Digital Literacy Hubs: Establish digital literacy hubs equipped with emerging technologies in local communities. These hubs can serve as centers for learning and skill development.

Community Engagement Platforms: Create online forums and social media groups where learners can collaborate, share experiences, and support one another. Peer learning enhances engagement.

By integrating these emerging technologies into digital literacy programs, the government can create dynamic, interactive, and inclusive

learning environments. These initiatives not only enhance the digital skills of the population but also prepare them for the challenges and opportunities of the digital age.

Several countries and private sector organizations have implemented innovative practices to enhance digital literacy programs using emerging technologies. Here are some best practices from around the world:

1. South Korea:

Online Coding Education: South Korea offers online coding education for youth through platforms like Coding Edu 2.0. These platforms use interactive tools and gamified learning to teach coding skills.

Virtual Reality Classrooms: Some South Korean schools utilize virtual reality classrooms, enhancing traditional education with immersive learning experiences.

2. United Kingdom:

BBC Micro:bit: The BBC Micro:bit initiative in the UK provides students with small programmable computers, encouraging them to learn coding and digital skills. Students can create various projects using these devices.

Digital Skills Training for Teachers: The UK government invests in training teachers to enhance their digital skills. Educators are equipped to teach digital literacy effectively.

3. Estonia:

e-Estonia Skills Center: Estonia's e-Estonia Skills Center offers free online courses covering topics such as cybersecurity, digital marketing, and e-governance. The courses are interactive and feature real-life case studies.

Digital Nomad Visa: Estonia's digital nomad visa program attracts professionals from around the world, creating a diverse community of digital workers and promoting digital skills.

4. Singapore:

Smart Nation Initiative: Singapore's Smart Nation initiative focuses on integrating technology into various aspects of life. Digital literacy programs are a key component, emphasizing data analytics, coding, and cybersecurity skills.

Code in the Community: A program in Singapore that offers free coding classes to children from lower-income families, providing them with digital skills early in life.

5. United States:

TechHire Initiative: TechHire is a U.S. government initiative that partners with communities to train individuals for technology jobs. It focuses on non-traditional pathways, providing digital skills training to underserved populations.

Private Sector Initiatives: Tech companies in the U.S., such as Microsoft, Google, and Apple, provide free online resources and tutorials for digital skills training. They offer platforms like Microsoft Learn and Google Digital Garage.

7. Private Sector Initiatives:

Microsoft's AI for Good: Microsoft offers AI for Good initiatives, providing training in artificial intelligence and machine learning. These programs empower individuals and organizations with AI skills to address societal challenges.

Google IT Support Professional Certificate: Google offers an online certification program that provides IT support training. Learners acquire skills in troubleshooting, customer service, and networking, enhancing their employability.

8. Online Learning Platforms:

Coursera, edX, Udacity: These platforms partner with universities and organizations worldwide, offering courses on digital skills, programming, data science, and cybersecurity. Learners can access high-quality education from renowned institutions.

These best practices emphasize the importance of collaboration between governments, private sector entities, and educational institutions. By leveraging emerging technologies and innovative approaches, these initiatives enhance digital literacy, equipping individuals with the skills needed for the digital future.

Q.21 What steps should be taken to ensure that AI and new technologies do not result into further digital divide and every section of the

society has access to the new technologies and resultant economic opportunities?

Comments :

Preventing further digital divide and ensuring equitable access to AI and new technologies require deliberate policies, investments, and initiatives. Here are steps that can be taken to promote inclusivity and equal opportunities for all sections of society:

1. Promote Digital Literacy:

Accessible Training Programs: Offer free or low-cost digital literacy programs that teach essential skills related to AI and new technologies. Tailor these programs for different age groups and educational backgrounds.

Focus on Underserved Communities: Target digital literacy initiatives specifically at underserved communities, including rural areas, low-income neighborhoods, and marginalized populations.

2. Affordable Access to Technology:

Subsidized Devices: Provide subsidies or low-cost options for devices like smartphones and computers, ensuring affordability for individuals in low-income households.

Affordable Internet: Collaborate with internet service providers to offer discounted or subsidized internet plans for low-income families, ensuring access to online resources.

3. Inclusive AI Education:

AI Education in Schools: Integrate AI education into school curricula to familiarize students with the technology from a young age. Make sure these programs are inclusive and accessible to all students, regardless of their background.

Online AI Courses: Offer free or affordable online courses on AI and new technologies, making them accessible to anyone with an internet connection.

4. Community Engagement:

Community Centers: Establish community centers equipped with computers and internet access. These centers can serve as hubs for digital learning and provide support to individuals who lack access at home.

Local Workshops and Training: Organize workshops and training sessions on AI and technology at the community level. Engage local leaders and influencers to promote participation.

5. Inclusive AI Development:

Diverse Development Teams: Encourage diversity in AI development teams. Teams that reflect a variety of backgrounds and perspectives are more likely to create technologies that are inclusive and unbiased.

Ethical AI Guidelines: Develop and adhere to ethical guidelines in AI development to ensure fairness, transparency, and accountability in algorithms and AI systems.

6. Accessible AI Applications:

Accessibility Features: Design AI applications with accessibility features such as screen readers, voice commands, and subtitles, ensuring they can be used by individuals with disabilities.

User Testing: Conduct user testing with diverse groups to identify and address potential barriers in AI applications.

7. Government Policies and Regulation:

Regulation: Implement regulations that ensure fair access and use of AI technologies. Regulate against discriminatory algorithms and biased AI systems.

Digital Inclusion Policies: Develop comprehensive digital inclusion policies that specifically target marginalized communities, outlining strategies and investments for their digital empowerment.

8. Public-Private Partnerships:

Collaborative Initiatives: Foster partnerships between government, private sector, and CAGs to develop and implement digital inclusion initiatives. Leverage the expertise and resources of multiple sectors for impactful programs.

Private Sector Contributions: Encourage private companies to contribute to digital inclusion efforts as part of their corporate social responsibility (CSR) initiatives.

9. Continuous Monitoring and Evaluation:

Impact Assessments: Regularly assess the impact of digital inclusion initiatives on marginalized communities. Use feedback from these assessments to refine programs and address emerging challenges.

Data-Driven Decision Making: Use data analytics to identify areas with low digital inclusion rates and target interventions accordingly.

10. Public Awareness Campaigns:

Awareness Programs: Conduct public awareness campaigns to inform citizens about the benefits of digital literacy and how new technologies can create economic opportunities. Address myths and misconceptions about AI.

Celebrate Success Stories: Share success stories of individuals from underserved communities who have leveraged digital skills and AI technologies to improve their lives.

By adopting these measures, governments, private sectors, and communities can work together to bridge the digital divide, ensuring that AI and new technologies create opportunities for all sections of society, regardless of their socioeconomic background or geographic location.

Indicators and Dashboard for monitoring Digital Inclusion

Q.22 What should be key performance indicators to measure, monitor and track the progress of the key factors of digital inclusion in the country mentioned below?

Digital Connectivity

Digital Affordability

Digital Literacy

Comments：

Measuring, monitoring, and tracking the progress of digital inclusion initiatives are crucial to ensuring their effectiveness. Key Performance Indicators (KPIs) help evaluate the impact of these initiatives and guide decision-making. Here are some key factors of digital inclusion and corresponding KPIs to measure progress:

1. Internet Access:

Percentage of Population with Internet Access: Measure the percentage of the population that has access to the internet, either through fixed broadband or mobile networks.

Rural-Urban Internet Access Disparity: Compare internet access rates between rural and urban areas to identify disparities and target interventions accordingly.

2. Digital Literacy and Skills:

Number of Individuals Trained: Track the number of individuals who have participated in digital literacy programs and training sessions.

Digital Literacy Assessment Scores: Conduct assessments to measure the improvement in digital skills among participants. Track changes in scores over time.

3. Affordability:

Cost of Internet as a Percentage of Income: Calculate the percentage of average income spent on internet access. Lower percentages indicate higher affordability.

Number of Subsidized Devices Distributed: Measure the distribution of subsidized or low-cost devices to individuals or households in need.

4. Usage and Adoption:

Frequency of Internet Use: Measure how often individuals use the internet. Regular usage indicates higher adoption rates.

Number of Transactions Conducted Online: Track the number of online transactions (e.g., payments, registrations) to assess the adoption of digital services.

5. E-Government Services:

Number of E-Government Service Users: Measure the number of citizens using online government services for various purposes.

User Satisfaction with E-Government Services: Conduct surveys to gauge user satisfaction levels with the quality and accessibility of e-government services.

6. Inclusivity:

Digital Inclusion Index: Develop a composite index that considers various factors (access, skills, affordability) to measure overall digital inclusion progress.

Targeted Population Participation Rates: Measure the participation rates of specific target populations (e.g., rural communities, senior citizens) in digital inclusion programs.

7. Infrastructure Development:

Expansion of Broadband Coverage: Track the expansion of broadband networks, especially in underserved and rural areas.

Number of Public Wi-Fi Hotspots: Measure the availability and growth of public Wi-Fi hotspots in public places like parks, libraries, and transportation hubs.

8. Digital Safety and Security:

Cybersecurity Incidents: Monitor the number of reported cybersecurity incidents and breaches, as well as the response time to mitigate these incidents.

Number of Cybersecurity Training Participants: Track the number of individuals participating in cybersecurity awareness and training programs.

9. Economic Impact:

Number of Digital Jobs Created: Measure the number of jobs created in the digital sector, including technology startups, online businesses, and IT services.

Economic Growth in Digital Industries: Track the growth rate of GDP contributed by digital industries and online commerce.

10. Social Impact:

Community Engagement: Measure community engagement in digital initiatives, including the participation of community members in workshops, events, and online discussions.

Improved Quality of Life Indicators: Assess improvements in various quality of life indicators (healthcare access, education levels, employment rates) influenced by digital inclusion efforts.

Regularly monitoring these KPIs allows policymakers and organizations to assess the effectiveness of digital inclusion initiatives, identify areas that require improvement, and adjust strategies accordingly to ensure progress toward a more digitally inclusive society.

Q.23 What measures should be taken to provide high-speed broadband connectivity to schools in the country, especially in states with low number of schools having internet connectivity?

Comments :

Providing high-speed broadband connectivity to schools in regions with limited internet infrastructure is vital for enhancing educational opportunities and digital literacy. Following measures can be taken to achieve this goal:

1. Needs Assessment and Planning:

School Internet Mapping: Conduct a comprehensive survey and mapping of schools without internet connectivity, identifying their locations, infrastructure, and specific connectivity requirements.

Assessment of Connectivity Options: Evaluate various connectivity options such as fiber optic, satellite, and wireless technologies. Choose the most suitable options based on the geographical and infrastructural conditions of the region.

2. Public-Private Partnerships:

Collaboration with Telecom Companies: Partner with private telecom companies to extend their broadband infrastructure to schools in underserved areas. Explore incentives for companies to invest in these regions.

Government Subsidies: Provide subsidies or financial incentives to internet service providers to offer high-speed broadband services to schools at reduced costs.

3. Infrastructure Development:

Fiber Optic Expansion: Invest in the expansion of fiber optic networks to connect schools in remote areas. Fiber optics provide high-speed and reliable internet connectivity.

Wi-Fi Infrastructure: Establish Wi-Fi networks within schools to ensure seamless connectivity within the school premises, enabling students and teachers to access educational resources easily.

4. Satellite Internet Services:

Satellite Internet: Explore satellite internet services for schools in remote and mountainous regions where laying cables or fiber optics is challenging.

Satellite internet ensures connectivity even in geographically isolated areas.

5. Digital Education Platforms:

Offline Access: Implement offline digital education platforms that can be accessed without a continuous internet connection. These platforms can be periodically updated when internet access is available.

Educational Content Servers: Set up local servers within schools that host educational content, enabling students and teachers to access resources without relying on external internet connections.

6. Community Engagement:

Community Internet Centers: Establish community internet centers near schools, allowing both students and local residents to access the internet. These centers can serve as hubs for digital learning.

Community Awareness Programs: Conduct awareness programs within communities to highlight the importance of internet connectivity in education. Encourage community support for school connectivity initiatives.

7. Government Initiatives and Funding:

Government Funding: Allocate specific budgetary provisions for providing high-speed broadband connectivity to schools in regions with low internet penetration.

Government Schemes: Introduce government schemes and grants specifically aimed at improving internet connectivity in schools, especially in underserved states and regions.

8. Capacity Building:

Teacher Training: Provide training to teachers on utilizing digital resources and integrating technology into their teaching methods. Digital literacy among teachers is crucial for effective use of internet resources.

Technical Support: Establish a system for technical support and maintenance to ensure that schools have ongoing assistance in managing their internet connectivity.

9. Regular Monitoring and Support:

Regular Performance Monitoring: Implement a monitoring system to track the performance of internet connectivity in schools. Address issues promptly to minimize downtime.

Helpdesk Services: Set up a dedicated helpdesk or support services to assist schools in resolving connectivity-related problems.

10. Research and Development:

Innovation Grants: Offer grants and incentives for research and innovation in developing cost-effective and sustainable solutions for providing high-speed internet connectivity to schools in challenging environments.

By implementing these measures and adopting a multi-stakeholder approach involving government agencies, private sector partners, and local

communities, it is possible to bridge the digital divide and provide high-speed broadband connectivity to schools, especially in states with a low number of schools having internet connectivity.

Q.24 How effective is a dashboard as a measure for evaluating and tracking the progress made in respect of the various indicators of the three key areas of digital inclusion? What are the critical parameters and at what level (i.e., at state or district or towns/cities or block or Gram Panchayat levels), such parameters should be captured in the dashboard?

Comments :

A dashboard can be highly effective as a measure for evaluating and tracking the progress made in the context of various indicators of digital inclusion. Because :

1. Centralized Data Visualization:

Data Aggregation: Dashboards aggregate data from various sources, providing a centralized view of multiple indicators. This aggregation simplifies complex data sets, making it easier for policymakers to interpret and act upon the information.

2. Real-Time Monitoring:

Timely Updates: Dashboards can provide real-time or near-real-time updates, allowing stakeholders to monitor progress continuously. Timely data is essential for making informed decisions promptly and adjusting strategies based on current trends.

3. Customization and Drill-Down Capabilities:

Customizable Metrics: Dashboards can be tailored to display specific metrics and indicators based on the goals of digital inclusion initiatives. Customization ensures that the dashboard aligns with the specific priorities of the program.

Drill-Down Functionality: Users can drill down into specific data points to gain detailed insights. This feature allows policymakers to identify trends, challenges, and areas requiring intervention.

4. Data Transparency:

Transparency: Dashboards enhance transparency by making data accessible to stakeholders, including policymakers, researchers, and the public. Transparent reporting builds trust and accountability in digital inclusion efforts.

5. Performance Monitoring:

Key Performance Indicators (KPIs): Dashboards can display KPIs related to internet access, digital skills, affordability, and usage patterns. Monitoring KPIs provides a clear understanding of the program's performance and impact on digital inclusion metrics.

Comparative Analysis: Dashboards allow for the comparison of data over time or across different regions. Comparative analysis helps identify disparities and successes, enabling evidence-based decision-making.

6. Decision Support Tool:

Informed Decision Making: Dashboards serve as decision support tools, providing data-driven insights to policymakers. Data visualization helps in identifying areas that need improvement and allocating resources effectively.

7. User Engagement and Accountability:

Engagement: Dashboards can be accessible to the public, encouraging citizen engagement and awareness about digital inclusion efforts. Public access to dashboards fosters community involvement and accountability among stakeholders.

Accountability: Dashboards create accountability mechanisms, enabling stakeholders to hold policymakers and organizations responsible for the progress (or lack thereof) in digital inclusion initiatives.

8. Early Warning Systems:

Alerts and Notifications: Dashboards can include alert systems that notify stakeholders when certain metrics fall below or exceed predefined thresholds. Early warnings allow for timely interventions to address issues.

9. Continuous Improvement:

Feedback Loop: Dashboards facilitate a feedback loop where the data collected can inform the refinement of digital inclusion strategies. Insights gained from the dashboard help in adapting programs to be more effective.

10. Resource Optimization:

Resource Allocation: Data from dashboards can guide the allocation of resources, ensuring that funding, training programs, and infrastructure investments are directed to areas with the greatest need.

In summary, a well-designed dashboard is a powerful tool for evaluating and tracking progress in digital inclusion initiatives. It provides actionable insights, supports evidence-based decision-making, enhances transparency, and engages stakeholders, ultimately contributing to more effective and equitable digital inclusion efforts.

Q.25 Who should be responsible to evaluate and track the progress of digital inclusion including development and management of the dashboard?

Comments :

Evaluating and tracking the progress of digital inclusion initiatives, including the development and management of dashboards, requires collaboration between various stakeholders. The responsibility is often shared among different entities to ensure a comprehensive, transparent, and effective monitoring process. Here are the key stakeholders and their roles:

1. Government Agencies:

Policy Formulation: Government agencies should be responsible for formulating policies related to digital inclusion. They set the goals, objectives, and indicators that need to be tracked.

Data Collection: Government bodies should collect official data related to digital inclusion, such as internet penetration rates, digital literacy levels, and access to online government services.

2. TRAI :

Data on Connectivity: TRAI should collect data on internet connectivity, broadband penetration, and the quality of services provided by internet service providers (ISPs). This data is crucial for tracking the availability and quality of internet access.

3. Local Government and Municipalities:

Infrastructure Development: Local governments can play a role in infrastructure development, including the expansion of broadband networks, establishing public Wi-Fi hotspots, and ensuring internet access in public spaces and community centers.

4. Educational Institutions:

Digital Literacy Programs: Schools, colleges, and universities should be involved in digital literacy programs. They can provide data on the number of students trained, digital skills assessment scores, and the integration of technology into the curriculum.

5. CAGs and Community Groups:

Community Engagement: NGOs and community groups often work closely with local communities. They can collect qualitative data, conduct surveys,

and engage in community-based digital inclusion initiatives, providing valuable insights.

6. Private Sector and Internet Service Providers (ISPs):

Data on Internet Usage: ISPs can provide data on internet usage patterns, customer demographics, and user behavior, which can aid in understanding digital adoption rates.

Partnerships: Private companies can partner with the government and NGOs to sponsor digital literacy programs, offer subsidized devices, and support infrastructure development.

7. Research Institutions and Academia:

Research and Analysis: Research institutions can conduct in-depth studies, surveys, and analysis on digital inclusion trends and challenges. They can provide valuable inputs for policymaking and program evaluation.

8. Technology and Data Analytics Experts:

Dashboard Development: Technology experts and data analytics professionals should be responsible for developing the digital inclusion dashboards. They design the interface, integrate data sources, and ensure the dashboard's functionality.

9. Citizens and Communities:

User Feedback: Citizens and communities are end-users of digital inclusion initiatives. Their feedback, experiences, and participation in surveys can

provide valuable qualitative data. Public engagement ensures that programs align with the actual needs of the population.

10. International Organizations and Donors:

Funding and Support: International organizations and donors can provide funding, expertise, and technical support for digital inclusion initiatives. They often support research, capacity-building, and the implementation of innovative projects.

Collaboration and coordination among these stakeholders are essential. Regular meetings, data sharing, and feedback loops ensure that the digital inclusion initiatives are comprehensive, well-informed, and responsive to the evolving needs of communities. Additionally, involving citizens and communities in the evaluation process enhances the inclusivity and effectiveness of digital inclusion efforts.

Digital Inclusion for MSMEs

Q.26 What efforts are required to provide reliable digital connectivity to MSMEs at affordable costs to empower them through new technologies for effective participation in the digital economic activities?

Comments :

Providing reliable digital connectivity to Micro, Small, and Medium Enterprises (MSMEs) at affordable costs is crucial for empowering them

through new technologies and enabling their effective participation in the digital economy. Following key efforts required to achieve this goal:

1. Infrastructure Development:

Fiber Optic Expansion: Expand fiber optic networks to reach industrial zones and MSME clusters. Fiber optics offer high-speed and reliable internet connectivity essential for digital activities.

Last-Mile Connectivity: Invest in last-mile connectivity solutions such as fixed wireless access, satellite internet, and point-to-point wireless connections to connect MSMEs in remote or underserved areas.

2. Affordable Internet Plans:

Subsidized Internet Packages: Negotiate with internet service providers to offer subsidized or discounted internet plans tailored for MSMEs. Government subsidies can significantly reduce costs for businesses.

Group Discount Programs: Facilitate group discount programs where MSMEs in specific clusters can collectively negotiate lower rates for high-speed internet services.

3. Digital Literacy and Skill Development:

Training Programs: Organize training sessions and workshops to enhance digital literacy and skills among MSME owners and employees. Educated businesses are better equipped to leverage digital technologies.

Online Learning Platforms: Provide access to online platforms offering courses on digital marketing, e-commerce, cybersecurity, and other relevant topics. Encourage MSMEs to upskill their workforce.

4. Financial Support and Incentives:

Subsidies for Digital Tools: Offer financial incentives or subsidies for MSMEs to invest in digital tools, software, and technologies. Financial support can ease the initial investment burden.

Tax Benefits: Provide tax benefits or credits to MSMEs that adopt digital technologies, encouraging them to invest in digital infrastructure and solutions.

5. Government-Backed Initiatives:

Digital MSME Platforms: Establish government-backed digital platforms where MSMEs can create an online presence, showcase products/services, and conduct transactions. These platforms can provide basic digital tools and resources.

Government Marketplace: Create a centralized government marketplace where MSMEs can register and participate in e-procurement processes, expanding their market reach and increasing revenue opportunities.

6. Technical Support:

Helpdesk and Technical Assistance: Set up a dedicated helpdesk or helpline where MSMEs can seek technical assistance for digital

connectivity issues, software integration, and other technology-related challenges.

Digital Consultants: Provide access to digital consultants or technology experts who can guide MSMEs in choosing appropriate digital solutions tailored to their specific needs.

7. Collaboration with Private Sector:

Public-Private Partnerships: Collaborate with private sector entities, especially internet service providers, to jointly develop and implement affordable digital connectivity solutions for MSMEs.

Technology Subsidies: Encourage technology companies to offer subsidized hardware and software solutions to MSMEs, making it more affordable for them to adopt digital tools.

8. Market Access and E-commerce Platforms:

E-commerce Training: Provide training on e-commerce practices, enabling MSMEs to sell products/services online. Empowering MSMEs with online sales skills opens new revenue streams.

Partnerships with E-commerce Platforms: Facilitate partnerships between MSMEs and e-commerce platforms, providing them with a platform to showcase and sell their products to a wider audience.

9. Data Security and Privacy Measures:

Cybersecurity Awareness: Educate MSMEs about cybersecurity best practices to ensure the security of their digital transactions and data.

Data Protection Regulations: Enforce data protection regulations to build trust among MSMEs regarding digital transactions. Clear guidelines enhance their confidence in adopting digital technologies.

10. Monitoring and Feedback Mechanism:

Feedback Loops: Establish a feedback mechanism where MSMEs can provide input on the effectiveness of digital connectivity initiatives. Use their feedback to refine programs and address challenges.

Regular Monitoring: Continuously monitor the adoption rates, connectivity status, and digital literacy levels of MSMEs. Regular assessments help gauge the impact of digital inclusion efforts.

By implementing these efforts, governments, private sector partners, and non-governmental organizations can create an ecosystem where MSMEs have reliable, affordable, and accessible digital connectivity. Empowering MSMEs through new technologies enhances their competitiveness, expands their market reach, and fosters economic growth in the digital economy.

Q.27 Whether the schemes of fibre connectivity in villages and rural areas such as BharatNet can be leveraged to provide the digital connectivity to MSMEs at affordable costs? If yes, please suggest the steps to be taken to extend such connectivity?

Comments :   Mentioned above.

Q.28 How DPIs can be used to allow the marginalized communities and MSMEs to access new technologies?

Comments : **Mentioned above.**

Q.29. What efforts can be made to increase awareness and digital literacy levels, especially in 5G, Big Data and AI/ ML, to the business owners and employees of the MSMEs? What kind of framework is needed in this regard? Please provide your answers with suitable justification.

Comments : **Mentioned above.**

Q.30 Stakeholders may also suggest any other measures not covered in the consultation document to improve Digital Inclusion in the country with suitable justification.

Comments : **No.**

Thanks.

Yours faithfully,

(Dr. Kashyapnath)
President
Member Organization : TRAI