NEW INDIAN CONSUMER INITIATIVE

Consultation Paper on Digital Inclusion in the Era of Emerging Technologies

14th September 2023

Preamble:

NICI (New Indian Consumer Initiative) commends the Telecom Regulatory Authority of India (TRAI) for addressing the crucial issue of "Digital Inclusion in the Era of Emerging Technologies" through a Consultation Paper. It acknowledges the irreversible impact of digitalization on the economy and society, emphasizing that digital inclusion is essential to bridge the existing digital divides. NICI identifies key gaps in digital adoption, including usage, gender, rural-urban, and connectivity disparities in educational and healthcare institutions. Factors contributing to these gaps are highlighted as digital literacy, connectivity issues, affordability concerns, and the rapid evolution of emerging technologies.

While India has demonstrated significant progress in digitalization, with a 200% increase in rural internet subscriptions and a 158% increase in urban internet subscriptions from 2015 to 2021, challenges persist. The Economic Survey 2023 indicates a substantial rise in digital financial transactions, particularly through UPI. Despite these advancements, nearly 40% of the country's population, mainly in rural areas, still lacks internet access.

The concept of the digital divide reflects the disparity between those who have affordable access, skills, and support to effectively engage online and those who do not. This divide hinders equal participation and opportunities, disproportionately affecting specific groups such as Indigenous peoples, households with low incomes, people with disabilities, individuals in rural areas, and older adults.

Introduction:

India's journey towards digital transformation, starting from the early 90s and 2000s with various e-governance programs to the current government's ambitious Digital India initiative. The focus is on leveraging technology, including social media, mobility, analytics, and cloud, to provide on-demand governance and services, digitally empower citizens, and bridge the digital divide. The public and private sectors are seen as crucial partners in achieving these goals, with an emphasis on last-mile access, Wi-Fi connectivity, and cloud-based services.

The Digital India program aims to go beyond traditional e-governance, promoting participatory governance, transparency, and revolutionizing public service delivery. The importance of broadband as a development tool is highlighted, and the program strives to address the digital divide, particularly in rural areas. India's capacity for innovation in the digital space and its role in supporting other countries facing similar challenges.

Digital transformation is recognized as a strategic priority for India, with a significant focus on initiatives such as Aadhaar, Digi Locker, and digital payments. The COVID-19 pandemic accelerated technological adoption, emphasizing the role of technology in ensuring continuity across sectors. As India seeks to enhance its manufacturing prowess, emerging technologies like AI, ML, IoT, robotics, blockchain, and cloud computing are expected to drive economic value.

The G20 presidency was an opportunity for India to reinforce its global leadership in digital technologies. The country aims to promote investment in digital infrastructure, enhance digital skills, enforce intellectual property rights, and encourage technology adoption by MSMEs.

Key Definitions:

1. Digital Divide:

-Definition: The gap between those who have access to affordable digital resources, possess the necessary skills, and receive support to engage effectively online, and those who lack these resources.

-Impact: Prevents equal participation and opportunity in various aspects of life.

2. Digital Equity:

-Definition: A state in which all individuals have the information technology capacity needed for full participation in society, democracy, and the economy.

-Importance: Essential for civic and cultural participation, employment, lifelong learning, and access to essential services.

3. Digital Inclusion:

-Definition: Efforts and policies aimed at ensuring that all individuals, irrespective of socioeconomic status, geographic location, or other factors, have equal access to and benefit from digital technologies.

-Objective: To ensure that all individuals and communities, including the most disadvantaged, can access and use Information and Communication Technologies (ICTs).

Relationship between Digital Inclusion, Digital Divide, and Digital Equity:

-Digital Inclusion as a Means: Digital inclusion is considered a means to improve the digital divide, with the ultimate goal of achieving digital equity.

- Outcome: Digital equity represents a state where all individuals have the necessary IT capacity for full societal, democratic, and economic participation.

Global Commitment:

-Initiatives: Various countries globally have undertaken initiatives to bridge the digital divide and promote digital inclusion.

-Shared Commitment: Governments worldwide share a commitment to fostering social and economic development, ensuring universal access to digital technologies.

Significance in the Digital Age:

-Pervasiveness of Digital Life: In the current era of digital technologies, applications, and services, the digital way of life is pervasive in every socio-economic aspect of human activity.

-Critical Importance: Digital inclusion has become critical for individuals, enterprises, and government services, as it impacts every facet of life.

Role of ICTs:

-Key Role: Information and Communication Technologies (ICTs) play a pivotal role in building people-centered, inclusive, and development-oriented information societies.

-Empowerment: ICTs empower individuals and communities to create, access, utilize, and share information and knowledge, enabling them to achieve their full potential and improve their quality of life.

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.

Our Response:

1. Digital inclusion refers to the policies and initiatives aimed at providing internet access to all individuals, irrespective of their race, gender, income, or ability. As outlined by the National Defense Industrial Association in the USA, digital inclusion comprises five key components:

a. Ensuring affordable and robust broadband internet service for everyone

b. Providing internet-enabled devices that cater to user needs

c. Granting access to digital literacy training

d. Offering quality technical support

e. Developing applications and online content that foster self-sufficiency, participation, and collaboration.

2. Social endeavors seek to ensure that all individuals can enjoy the advantages of digital technology, fostering universal participation in the digital world without any form of discrimination or exclusion. Policy Perspective:

The overarching vision of the digital inclusion policy is to create a nation that embraces digital inclusivity for all. The policy aims to inspire and engage every citizen, fostering active participation and the pursuit of benefits within the digital society.

Policy Objectives:

1. Inclusive Targeting:

(a) Prioritize outreach to vulnerable groups, including the elderly and disabled, ensuring their inclusion in the digital landscape.

(b) Adopt an active approach to motivate and encourage citizens across all demographics to join the digital realm, thereby extending the reach of digital benefits widely.

2.Comprehensive Approach:

Develop initiatives that address the needs and capabilities of all citizens who may lack motivation or proficiency in digital technology.

3. Motivational Strategies:

Implement strategies that actively motivate individuals to participate in the digital society, emphasizing the tangible benefits they can derive.

4. Education and Support:

Provide comprehensive digital literacy training to enhance the capabilities of citizens, enabling them to navigate and utilize digital technologies effectively.

5. Accessible Digital Infrastructure:

Ensure the availability of affordable, robust broadband internet services to all, eliminating barriers to entry and fostering equal access.

6. Inclusive Device Provision:

Facilitate access to internet-enabled devices tailored to diverse user needs, catering to the requirements of different demographic groups.

7. Dedicated Support Services:

Establish quality technical support mechanisms to assist citizens in overcoming digital challenges, ensuring a seamless and supportive digital experience.

8. Development of Inclusive Applications and Content:

Foster the creation of applications and online content designed to empower individuals, encouraging self-sufficiency, participation, and collaboration across various segments of the population.

The policy framework seeks to create an environment where every citizen is not only included in the digital sphere but is also motivated to actively seek and derive benefits from the opportunities presented by the digital society.

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?

Our Response:

The TRAI's consultation paper highlights the importance of aligning global indices, such as GSMA's Mobile Connectivity Index, to the Indian context. Additionally, it emphasizes certain factors that need consideration in these indices for the Indian landscape:

1. Digital Affordability:

a. Levies on TSPs:

- The competitive nature of the Indian telecom sector is acknowledged, with one of the lowest tariffs globally.

- However, the sector faces significant levies, including Licensee fees, USO levy, GST, etc., which impact the operators' costs.

- The burden of dual levies, where charges for input services are also considered revenue for license fees, is highlighted.

b. Spectrum Prices:

- The telecom sector faces substantial spectrum prices, including auction prices for access spectrum and % of AGR-based pricing for backhaul spectrum.

- These prices are noted to be among the highest globally when compared to matured markets.

2. Digital Infrastructure:

- Right of Way (RoW):

- Dependency on RoW for deploying network infrastructure is emphasized.

- RoW costs vary significantly across states/UTs and within different areas of states, influencing the overall cost of network deployment.

- RoW is suggested as a primary indicator for assessing the cost of network deployment.

3. Impact on TSPs Ability to Provide Connectivity:

- All the mentioned factors are asserted to play a crucial role in determining the ability of Telecom Service Providers (TSPs) to deliver quality and affordable connectivity.

4. Call for Rationalization:

- The statement strongly advocates for the rationalization of levies, spectrum prices, and RoW costs, emphasizing that addressing these aspects would significantly contribute to supporting digital inclusion.

- It is suggested that rationalization would enhance operators' capabilities to provide better-quality and more affordable connectivity.

In essence, the TRAI emphasizes the need for a nuanced approach in evaluating global indices in the Indian context. The focus on factors such as levies, spectrum prices, and infrastructure costs underscores the importance of aligning policies and regulations with the unique challenges and dynamics of the Indian telecom sector to further digital inclusion.

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?

Our Response:

Digital inclusion in any country is fundamentally driven by three interconnected pillars: digital connectivity, digital affordability, and digital literacy. Effectively addressing gaps in each of these areas through a comprehensive strategy is crucial for achieving widespread digital inclusion. This strategy should involve ensuring safe and affordable access to broadband and digital services, providing education and training for active participation in the digital economy, and making digital accessibility a default standard to enhance overall digital capability. The initial focus should be on assessing digital readiness to yield outcome-based impacts.

The transformative impact of the digital ecosystem, particularly during the COVID-19 pandemic, highlights the significance of substantial investments made by mobile operators globally. Indian Telcos, in particular, have played a pivotal role in positively impacting over a billion lives by providing access to inclusive digital growth. However, the global digital divide remains evident, with only 53% of people having access, leaving nearly 3.5 billion without access to essential digital services, including education for almost 1 billion children. To address this, a greater infusion of digital shifts throughout the population is imperative. Despite the significant increase in digital connectivity from 1 billion in 2002 to nearly 5.3 billion today, disparities persist across regions, gender, income levels, language, and age groups.

In India, certain remote areas still lack access to broadband networks, prompting collaborative efforts by the government and Telecommunication Service Providers (TSPs) to bridge this coverage gap. Another challenge lies in the availability of locally relevant content, often in English or non-native languages, limiting its accessibility to the rural population. Financial constraints further hinder individuals from owning digital devices and subscribing to broadband services.

A gendered digital divide is observed, with women being more susceptible to digital exclusion. This digital illiteracy has also discouraged women entrepreneurs from transitioning their

businesses into the online marketplace. Efforts are required to democratize digital access for people with disabilities and the transgender community to establish an inclusive digital environment. The elderly, especially during critical emergencies or medical crises, face difficulties staying connected digitally, contributing to the root causes of the digital divide among this demographic. Therefore, there is an urgent need to ensure digital inclusion for all, including the most vulnerable segments of society.

Dimension	Access	Skills	Use	Conducive environment
Indicators	• Electricity • Telephony and broadband • Points of Access (households, workplaces) • ICT Devices • Web accessibility • Gender gap	• Literacy • Academic life expectancy • Digital skills • Online safety	• Usage gap • Participation • Internet use • Basic online activities • e-Commerce • e-Banking • e-Government • e-Work • Social media • e-Participation	• Device affordability • Legally valid identification • Banking and Financial inclusion • Trust and online privacy • Community engagement • Digital security • Locally relevant Content

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?

Our Response:

The Government of India, through the National Digital Communications Policy (NDCP) of 2018 and the National Broadband Mission (NBM) of 2019, has undertaken commendable efforts to extend internet connectivity to the farthest reaches of the country, encompassing every Gram Panchayat (GP), village, and small town. The NDCP, specifically, underscores the goal of achieving universal broadband connectivity.

In addition to governmental initiatives, we propose an increased focus on digital infrastructure investment, supported by government funds, schemes, and incentives, particularly in rural and remote areas. To enhance internet connectivity and facilitate access to digital services, we recommend a temporary waiver of Right of Way (RoW) charges for the next 5 years in rural areas. During this period, charges would be limited to the cost of restoration for underground fiber, without additional rent.

Furthermore, we advocate for the abolition of the Universal Service Obligation Fund (USOF) levy, allowing Telecom Service Providers (TSPs) to expedite network expansion in underserved areas.

Recognizing the linguistic diversity of India, efforts should be directed towards promoting digital content in regional languages. This approach ensures that information and services are accessible to a wider audience, catering to diverse linguistic communities.

To empower rural communities in utilizing digital technologies, we suggest establishing training facilities in rural areas. These facilities would provide the necessary skills for rural residents to benefit from digital advancements, including the use of digital payment systems.

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?

Our Response:

The impact of BharatNet on improving tele-density and Internet density in rural areas remains uncertain due to a lack of data regarding the utilization of BharatNet fiber by eNodeB, gNodeB, or base stations. However, it is evident that there has been a substantial growth in Internet connections in rural regions, surpassing urban areas. Although specific data on the infrastructure utilizing BharatNet is unavailable, it is presumed to have played a significant role.

Over the past four years, rural Internet density has risen by 15% (from 25% in March 2019 to 40% in March 2023), while urban areas have seen a 9% increase (from 98% in March 2019 to 107% in March 2023). Despite fiberization efforts covering around 2 lakh Gram Panchayats, a substantial 70% gap in Internet density between rural and urban areas persists, indicating a persistent digital divide.

The government has already allocated funds for providing 4G connectivity in 24,680 uncovered villages in remote and challenging terrains, alongside a budget of 1.39 lakh Crores for BharatNet phase. Considering the persistent gap, the government should explore alternative technologies like Low Earth Orbit (LEO)-based satellite communication to meet the targets outlined in the National Digital Communications Policy of 2018 (NDCP-18).

Attention should be directed toward the efficient utilization of existing BharatNet infrastructure, addressing demand-side constraints. Additionally, the Telecom Regulatory Authority of India (TRAI) should include data related to Mobile Base Transceiver Stations (BTS), Public Wi-Fi hotspots, Fiber to the Home (FTTH), and connections provided using BharatNet fiber in its quarterly publications.

To enhance data usage, there is a need to provide applications and services in local or vernacular languages, promoting local content. Telemedicine facilities using BharatNet should be extended to all primary health centers, contributing to the accessibility of healthcare services in remote 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.

Our Response:

The rural-urban gap in internet density highlights a significant disparity, with urban areas having much higher penetration compared to rural regions.

To address these challenges and work towards achieving 100% digital inclusion, specific policy interventions are crucial. Here are potential areas for policy focus:

1. Usage Gap Mitigation:

- Identify and address the reasons behind the 61% usage gap in mobile internet, targeting areas with mobile connectivity but low usage.

- Implement awareness campaigns to educate users about the benefits of mobile internet and overcome barriers to adoption.

2. Rural-Urban Divide:

- Develop policies and initiatives that specifically target rural areas to bridge the gap in internet density.

- Invest in rural infrastructure development, including the expansion of network coverage and improvement of connectivity in remote areas.

- Introduce subsidies or incentives for telecom providers to invest in rural network infrastructure.

3. Gender Inclusivity:

- Implement policies focused on reducing the gender gap in digital access, addressing socio-cultural factors that contribute to disparities.

- Promote digital literacy programs specifically tailored for women to empower them with the skills needed to use mobile internet effectively.

- Encourage initiatives that provide affordable access to mobile devices for women in both urban and rural areas.

4. Affordability Measures:

- Implement policies to reduce the cost of mobile internet services, making them more affordable for a broader segment of the population.

- Explore partnerships with private sector entities to provide subsidized or free access in economically disadvantaged areas.

5. Digital Literacy Programs:

- Develop and implement comprehensive digital literacy programs targeting both urban and rural populations.

- Collaborate with educational institutions, NGOs, and private organizations to offer training on digital skills, emphasizing the advantages of mobile internet usage.

6. Community Engagement:

- Encourage community-based initiatives that promote digital inclusion and provide support at the grassroots level.

- Foster partnerships with local organizations, community leaders, and influencers to spread awareness and build trust in digital technologies.

By strategically addressing these areas through targeted policies, India can work towards closing the digital divide, achieving widespread internet access, and ensuring that all segments of the population, regardless of gender or geographic location, can fully participate in the digital economy.

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

Our Response:

The Government's initiative, Mission Antyodaya, aims to extend urban-level services to the rural or economically disadvantaged population. To achieve this goal in the telecom sector, the effective utilization of BharatNet infrastructure is crucial. The following proposal suggests incentivizing and encouraging service providers through fiberization of towers in rural areas:

1. Accessibility to BBNL Fiber on Commercial Grade Basis:

- Existing Fiber Infrastructure: BBNL has already laid out an extensive network of fiber across the country, including under-covered and uncovered rural/semi-urban areas.

- Commercial SLA Basis: The proposal recommends making this fiber available to Telecom Service Providers (TSPs) on a commercial grade Service Level Agreement (SLA) basis, ensuring high reliability with over 99.9% uptime and penalty clauses for any service disruptions.

- Market Pricing: The fiber should be accessible at market pricing applicable to rural/semi-urban areas, ensuring affordability for service providers.

- Policy Amendments: Relevant provisions of policies, guidelines, master service agreements, and acts need to be amended to facilitate this arrangement.

2. Encouraging Effective Utilization:

- Incentives: The government can provide additional incentives or subsidies to TSPs utilizing the BharatNet infrastructure for extending connectivity to rural institutions, households, and individuals.

- Public-Private Partnerships: Encourage public-private partnerships to promote collaboration between the government and private entities in the deployment and management of telecom infrastructure.

3. Rural Connectivity Development:

- Fiberization of Towers: The proposal emphasizes the fiberization of towers in rural areas, which involves connecting telecom towers with high-capacity fiber-optic cables, enhancing the overall network quality and capacity.

- Last-Mile Connectivity: The focus should be on extending fiber connectivity to the last mile, ensuring that even remote areas have access to high-quality and reliable telecom services.

4. Policy Revisions:

- Amendments: Proposes revising policies, guidelines, and agreements to accommodate the commercial use of BBNL fiber for rural connectivity.

- Alignment with Objectives: Ensure that these policy amendments align with the broader objectives of Mission Antyodaya, aiming for equitable access to telecom services in rural areas.

In summary, the proposal suggests a strategic approach to leverage existing BharatNet infrastructure by making BBNL fiber available to TSPs on commercial terms, encouraging fiberization of towers, and fostering a supportive policy environment. These measures aim to enhance rural connectivity, aligning with the overarching goal of bringing urban-level services to the rural and economically disadvantaged population.

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?

Our Response:

No Comments.

Q.9 What measures are required for adopting a collaborative approach to utilise 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.

Our Response:

a. Passive infrastructure sharing in India has been successfully established, positioning the country as a pioneer in this domain. To further promote this collaborative approach, we recommend the following measures:

b. The government should actively encourage infrastructure sharing by allowing the pass-through of any consideration paid by one Telecom Service Provider (TSP) to another for both passive and active infrastructure sharing. This entails permitting infrastructure-sharing charges as pass-through items when determining the Adjusted Gross Revenue (AGR) for the calculation of License Fee (LF) and Spectrum Usage Charges (SUC).

c. In alignment with the Telecom Regulatory Authority of India's (TRAI) recommendations on "Rating of Buildings or Areas for Digital Connectivity" dated February 20, 2023, it was suggested that revenues generated from the sharing of active wireless equipment should not attract LF. Such revenues should be subtracted from the Gross Revenue (GR) to ascertain the Adjusted Gross Revenue (ApGR) of the lessor licensee. We request TRAI to recommend this stance to the Department of Telecommunications (DoT) for prompt implementation.

By implementing these recommendations, the government and regulatory bodies can foster a conducive environment for infrastructure sharing, ultimately contributing to the efficiency and optimization of the telecommunications sector in India.

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?

Our Response:

Globally, numerous countries have recognized the importance of expanding telecommunication services through multiple service providers to achieve Universal Connectivity for all individuals, households, and communities. The primary focus of these efforts is to address the challenge of inadequate connectivity in economically challenging areas, especially rural regions, with the support of government funds.

Key Observations:

1. Objective of Universal Connectivity:

- The central objective in many countries' schemes is to attain Universal Connectivity, ensuring that services from multiple telecom service providers are available to all.

- Government funds are allocated to establish network infrastructure that can be utilized by all telecom service providers, fostering connectivity for the entire population.

2. Avoidance of Connectivity Islands:

- The emphasis is on avoiding the creation of "connectivity islands," where access is restricted to subscribers of a specific telecom service provider.

- The overarching goal is to establish a shared network infrastructure that benefits the public at large, ensuring that connectivity is not limited or exclusive to users of a particular TSP.

3. Focus on Public Good and Economic Benefits:

- The approach is well-established across various countries, aligning with the principles of public good and contributing to economic development.

- By creating shared infrastructure accessible to multiple service providers, these initiatives contribute to the broader objectives of Digital Inclusion, ensuring that the benefits of connectivity are widespread.

4. Economic Impact and Digital Inclusion:

- The efforts aim to not only address connectivity challenges but also have a positive impact on the economy by promoting widespread access to digital services.

- Digital Inclusion is considered a critical aspect of these initiatives, recognizing that a connected population contributes to economic growth, innovation, and overall societal progress.

a.) Germany:

Germany has approved a substantial €1.1 billion plan aimed at funding the construction of approximately 5,000 communication sites across the country. The primary objective of this plan is to significantly enhance network coverage, with the specific targets of reaching 99.95% of households and covering 97.5% of the total landmass.

Key Points of the Plan:

1. Financial Allocation:

- The German government has allocated a substantial €1.1 billion for the execution of this ambitious plan.

- The significant financial commitment underscores the importance placed on expanding and improving the country's communication infrastructure.

2. Site Construction:

- The plan involves the construction of approximately 5,000 communication sites, indicating a comprehensive effort to boost the existing network infrastructure.

- These sites are strategically positioned to maximize coverage across the entire country, with a focus on reaching underserved or remote areas.

3. Coverage Targets:

- The specific targets set by the plan include achieving coverage for 99.95% of households in Germany.

- Additionally, the plan aims to cover 97.5% of the total landmass, emphasizing a commitment to extending network services to even geographically challenging areas.

4. Improving Connectivity:

- The overarching goal of the plan is to improve connectivity for the population by addressing potential coverage gaps and ensuring a more comprehensive network reach.

- This initiative aligns with the broader efforts to enhance digital access and connectivity for citizens across the country.

5. Impact on Rural Areas:

- By aiming for widespread coverage, the plan is likely to have a significant impact on rural and remote areas, which often face challenges in accessing reliable communication services.

- Improved connectivity in these regions can contribute to economic development, education, healthcare, and overall quality of life for residents.

b.) United Kingdom

The United Kingdom (UK) government, in collaboration with Telecommunication Service Providers (TSPs), is developing a joint solution to address coverage issues in rural areas. This model is seen as having the potential for implementation in other countries, benefiting all stakeholders involved:

Key Features of the UK Government's Approach:

1. Collaborative Solution:

- The UK government and TSPs are working together to develop a collaborative solution to improve coverage in rural areas.

- This collaborative model is designed to address the concerns of partial not-spots (areas with coverage by some but not all Mobile Network Operators - MNOs) and total not-spots (areas without any coverage).

2. Shared Rural Network (SRN):

- The proposed solution involves the establishment of a Shared Rural Network (SRN) over a 20-year period.

- To address partial not-spots, TSPs commit to upgrading existing rural sites to accommodate all four MNOs.

- For total not-spots, TSPs will jointly build new sites, ensuring comprehensive coverage in areas with no existing network infrastructure.

3. Government Incentives:

- The government incentivizes TSPs to collaborate by planning to impose national roaming on the MNO that wins the coverage obligation.

- This approach encourages collaboration among TSPs, allowing for a more cost-effective and efficient expansion of the network.

4. Coverage Goals:

- The overarching goal of this initiative is to provide high-quality 4G coverage to 95% of the country by 2025.

- Each MNO is expected to reach at least 92% coverage individually by this date, with the anticipation that increased sharing on existing sites will contribute to achieving 88% coverage for each MNO.

Benefits to Stakeholders:

1. Government:

- The government can achieve its policy goals related to coverage in rural areas at a reasonable cost.

- The collaborative approach reduces the burden of imposing onerous and distortive coverage obligations on individual TSPs.

2. TSPs:

- TSPs can reasonably expand their networks without facing excessive coverage obligations.

- The collaboration allows for more efficient utilization of existing infrastructure and joint investments in new sites.

3. Consumers:

- Consumers benefit from better services, as multiple Mobile Network Operators are present in more places.

- The initiative addresses concerns related to partial and total not-spots, ensuring improved connectivity for rural residents.

c. Australia

Australia, similar to the UK, has implemented schemes to enhance mobile coverage through multiple carriers, demonstrating a commitment to digital inclusion, economic opportunities, and public safety. The Australian Government's Better Connectivity Plan for Regional and Rural Australia is a significant initiative, allocating substantial funds to address connectivity challenges in rural and regional communities. Here are key details;

Better Connectivity Plan Highlights:

1. Government Investment:

- The Australian Government has allocated more than $1.1 billion to the Better Connectivity Plan, forming part of a larger investment of over $2.2 billion in regional communications.

2. Telecommunications Agenda:

- The Better Connectivity Plan is a crucial component of the government's broader telecommunications agenda, aiming to enhance connectivity in regional and rural areas.

3. 2022-23 Budget Allocation:

- In the 2022-23 October Budget, $656 million was allocated over five years for the Better Connectivity Plan to improve mobile and broadband connectivity in rural and regional Australia.

4.Key Funding Allocations:

- Boosting Multi-Carrier Mobile Coverage: $400 million is allocated to enhance multi-carrier mobile coverage on regional roads, improve coverage in underserved regional and remote communities, and increase the resilience of communications services and public safety facilities.

- Regional Connectivity Program: $200 million is designated for two additional rounds of the Regional Connectivity Program. This program focuses on investing in place-based digital connectivity infrastructure projects in regional communities.

- On-Farm Connectivity: $30 million is allocated to enhance on-farm connectivity, allowing farmers to leverage connected machinery and sensor technology.

- Independent Audit of Mobile Coverage: $20 million is dedicated to conducting an independent audit of mobile coverage to identify black spots and guide investment priorities.

- Regional Tech Hub: $6 million is designated to boost funding for the Regional Tech Hub, supporting regional consumers in accessing advice and support on digital connectivity options.

Objectives:

- The Better Connectivity Plan aims to address mobile and broadband connectivity issues, enhance public safety, and provide economic and social opportunities in rural and regional Australia.

This comprehensive plan highlights the Australian Government's commitment to bridging the digital divide, fostering economic development, and ensuring the safety and connectivity of communities in regional and rural areas. It serves as a notable example of a multi-stakeholder approach to achieving better connectivity for the benefit of the public.

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 are required to be taken to make it more affordable? Please explain your answer with suitable justification.

Our Response:

The Indian government has implemented several initiatives to promote domestic smartphone manufacturing, such as the production-linked incentive (PLI) scheme, which has led to a 20% local value addition in the smartphone sector. Additionally, the government has reduced custom duty on the import of certain inputs for phone manufacturing, which is expected to result in cheaper mobile phones in the coming years. Furthermore, India is considering import duty cuts on components key to producing high-end smartphones, which could potentially boost local manufacturing and exports. These measures collectively create a framework that encourages companies to invest in domestic manufacturing, leading to job creation, economic growth, and reduced import dependency in the smartphone industry. The government's push with multiple PLI schemes has shown a positive impact, with increased local manufacturing share in the smartphone sector. The approval of subsidies for tech hardware manufacturers under the PLI scheme is expected to further bolster the country's electronics supply chain ambitions and create a significant number of jobs.

To achieve this:

1. Tax Subsidies and Input Subsidies:

- Introduce a dedicated low-cost phone with a subsidized cost structure, potentially through direct input subsidies or tax subsidies to manufacturers.

- Consider the removal of sales tax and subsidization or elimination of Value-Added Tax (VAT) on imported parts used in local assembly to significantly reduce overall costs.

2. Sourcing Efficiencies at Scale:

- Explore the potential benefits of sourcing at scale to lower shipping, warehousing, distribution, and sales costs.

- Implement just-in-time sourcing and large-volume sales strategies to realize substantial cost reductions.

3. World Bank Study and Proposal:

- Propose the World Bank to conduct a comprehensive study to assess the feasibility of these measures and recommend a viable proposal to the Telecom Regulatory Authority of India (TRAI), Department of Telecommunications (DOT), and the Ministry of Electronics and Information Technology (MEITY).

4. Consumer Financing Options:

- Recognize that even if current government schemes aimed at incentivizing local manufacturing prove successful, the impact on pricing will take time.

- In the interim, consider consumer financing options as crucial intervention streams to make smartphones more accessible to a wider demographic.

5. Stimulating Consumer Device Financing Market:

- Focus on stimulating the supply of financing in the consumer device financing market.

- Implement risk reduction efforts for suppliers to encourage their participation in the consumer financing ecosystem.

By adopting these measures, the government can work towards making smartphones more affordable in the short term while simultaneously supporting the growth of local manufacturing in the long run. This multifaceted approach aims to address both immediate consumer needs and contribute to the development of a robust and sustainable local manufacturing ecosystem.

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.

Our Response:

We strongly advocate for the significance of the second-hand smartphone market as a crucial contributor to improving affordability. This market provides consumers with cost-effective alternatives, making advanced technology more accessible across a broader demographic, while simultaneously addressing electronic waste and promoting sustainability.

The second-hand smartphone market presents substantial opportunities for rural populations grappling with the financial constraints of acquiring expensive smartphones. Offering affordable used devices can significantly empower rural communities, narrowing the digital gap prevalent in the country. By granting access to more economical smartphones, this initiative not only alleviates financial burdens for rural residents but also facilitates their active participation in the digital sphere. Consequently, this contributes to a comprehensive reduction in the digital divide, ensuring that individuals in remote areas can harness the benefits of technology and connectivity for personal and economic advancement.

However, we believe that the growth of the second-hand smartphone market is best fostered through market dynamics.

Additionally, we propose placing increased emphasis on microfinancing schemes and lending propositions for customers, enhancing their purchasing capacity to afford digital devices.

Leveraging software platform capabilities could be instrumental in implementing targeted subsidies to further support affordability initiatives.

Furthermore, strategic partnerships with smartphone and e-commerce players could be established to introduce propositions such as free screen replacement and extended warranties. This approach not only enhances the consumer experience but also encourages continued device utilization without the concern of incurring additional financial expenses.

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.

Our Response:

We acknowledge that several state governments have undertaken schemes to address the digital divide, resulting in significant uptake and the connection of numerous customers in affected areas. However, a critical flaw in these initiatives is their limited scope, focusing on specific states and areas rather than providing comprehensive coverage to all Indians. Furthermore, there has been a lack of follow-up on these schemes to facilitate device upgrades or plan improvements.

To address these shortcomings and ensure a more inclusive and sustained impact:

1. National Device Upgradation Scheme:

- Propose the introduction of a national device upgradation scheme that goes beyond regional limitations, aiming to cover all Indians.

- Design the scheme to not only provide initial connectivity but also focus on facilitating ongoing device upgrades and plan enhancements.

2. Outcome Measurement Through IMEIs:

- Evaluate the outcomes of these schemes by collaborating with device manufacturers to assess the number of active International Mobile Equipment Identities (IMEIs).

- Utilize data on active IMEIs as a measure of the continued presence of devices in the market, though it may not pinpoint whether all original beneficiaries are still actively using the service.

3. Comprehensive Monitoring and Evaluation:

- Introduce robust monitoring and evaluation mechanisms for the national device upgradation scheme to track its effectiveness over time.

- Incorporate regular assessments to ensure that the connectivity provided is sustained and that device upgrades and plan improvements are implemented as needed.

4. User Feedback and Engagement:

- Incorporate user feedback mechanisms to understand user experiences and challenges faced, enabling policymakers to make informed decisions for ongoing improvements.

- Establish channels for ongoing engagement with users to address evolving needs and preferences.

By implementing these measures, the government can transition from localized efforts to a comprehensive national strategy that not only connects individuals initially but also ensures ongoing access and upgradation opportunities. This approach addresses the digital divide on a broader scale and creates a more sustainable and inclusive framework for digital connectivity across the country.

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.

Our Response:

Individuals who continue to be excluded from the advantages of mobile internet tend to be disproportionately impoverished, less educated, persons with disabilities, residing in rural areas, and women. Given that affordability is a significant hurdle they face, it is imperative to address this issue, taking into account diverse socio-economic backgrounds and demographics. However, efforts to enhance affordability for specific population groups should not negatively impact market dynamics.

Certain mobile operators have introduced data offers targeting underserved or disadvantaged customer segments, such as those enrolled in social security programs or residing in remote locations. Policies and regulations should allow flexibility for the development of these and other pricing strategies that benefit underserved users.

Consideration may also be given to subsidizing social tariffs or internet-enabled handsets, as mentioned in the response to Question 15. Establishing eligibility criteria for such programs should involve careful consultation with the private sector and other government stakeholders. Eligibility criteria should be linked to broader policy objectives, ranging from enhancing productivity in agriculture to promoting women's empowerment. For instance, handset subsidies have been implemented to facilitate the distribution of public health insurance benefits to targeted women, while data subsidies have supported specific students in accessing remote learning. Therefore, beneficiaries of affordability interventions, through handset or data subsidies, should be tailored to the context of a particular initiative.

Women, particularly those in rural areas, often face the affordability barrier more profoundly than men due to lower average incomes, limited access to external sources of finance, and less financial independence. Therefore, prioritizing women for affordability interventions becomes crucial, especially considering that rural women are among the most digitally excluded. In India, for instance, mobile internet usage is reported at 62% for urban men, 42% for urban women, 47% for rural men, and only 26% for rural women.

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.

Our Response:

Certainly, various international best practices have been implemented to enhance digital devices and digital connectivity affordability, promoting inclusive participation in the digital society. Here are some key strategies and practices observed globally:

1. Subsidy Programs:

- Governments and organizations offer subsidies on digital devices to reduce the upfront cost for citizens, making technology more accessible.

2. Public-Private Partnerships:

- Foster collaborations between public and private sectors to jointly invest in and implement infrastructure projects, sharing the financial burden and accelerating digital development.

3. Incentives for Local Manufacturing:

- Encourage local manufacturing of digital devices through tax incentives, reducing production costs and promoting economic growth.

4. Spectrum Efficiency:

- Optimize the allocation and utilization of spectrum to enhance network efficiency, ensuring that available resources are used effectively to provide affordable connectivity.

5. Community Networks:

- Support community-driven initiatives to establish local networks, reducing costs and expanding connectivity in underserved or remote areas.

6. Digital Literacy Programs:

- Implement comprehensive digital literacy programs to empower citizens with the necessary skills to utilize digital devices and services effectively.

7. Universal Service Funds:

- Establish Universal Service Funds (USF) to finance projects aimed at providing affordable access to digital services in remote or economically disadvantaged areas.

8. Zero-Rating and Data Bundling:

- Collaborate with service providers to offer zero-rated services or data bundles, enabling users to access essential applications and services without incurring additional costs.

9. Smart Regulation:

- Adopt flexible and smart regulatory frameworks that foster competition, innovation, and investment in the digital sector while ensuring consumer protection.

10. E-Waste Management:

- Implement effective e-waste management programs to handle the disposal of electronic devices responsibly, promoting sustainability and minimizing environmental impact.

11. Digital Inclusion Policies:

- Develop comprehensive policies that prioritize digital inclusion, addressing the needs of marginalized or underserved populations to bridge the digital divide.

12. Public Wi-Fi Initiatives:

- Launch public Wi-Fi initiatives in urban and rural areas, offering affordable or free internet access in key locations to enhance connectivity for the general public.

13. Global Funding and Aid:

- Seek international funding and aid to support digital infrastructure projects, especially in developing nations, to bolster digital connectivity and affordability.

Adopting and adapting these best practices can contribute to the creation of an inclusive digital society, ensuring that citizens, regardless of their economic background or geographical location, can access and benefit from digital services.

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.

Our Response:

Implementing a results-based approach through the accreditation of literacy courses can have a substantial impact on digital literacy initiatives. This approach involves regular check-ins, feedback mechanisms, tests, and concrete recognition of accreditation through practical application of acquired information. While advanced digital literacy is crucial for leveraging digital services and emerging technologies like AI, basic digital literacy is particularly essential to bridge the adoption gap in rural, lower-income, and less-educated demographics.

Several government-driven digital literacy interventions, including the noteworthy PMGDISHA program, have been initiated to address this gap. To maximize the effectiveness of these initiatives, integration with existing large-scale government programs and services, such as those facilitated through Digital Public Infrastructures (DPIs) rails, is recommended. Bundling basic digital literacy efforts, like PMGDISHA, with digital financial service products or digitally enabled primary healthcare can significantly enhance the reach and impact of these programs.

The Indian government has implemented several initiatives to promote digital literacy, such as the IT Mass Literacy (National Digital Literacy Mission) and the Scheme for 'Digital Saksharta Abhiyan' (DISHA). The Pradhan Mantri Gramin Digital Saksharta Abhiyan (PMGDISHA) is another notable example of a government-driven digital literacy intervention. However, these schemes have been limited to certain states and areas only and do not cover all Indians. A results-based approach through accreditation of literacy courses would be impactful, with regular check-ins, feedback, tests, and concrete recognition of the accreditation through actual use of the information. Basic digital literacy is the key literacy area addressing the adoption gap in rural, lower income, and less educated demographics. Integrating with existing large-scale government programs and services and bundling with digital financial service products or digitally enabled primary healthcare can help further offer basic digital literacy efforts like PMGDISHA at scale. The measure for the outcomes of these schemes can be found from the device manufacturers based on the detail of active IMEIs, which will give the measure on how many devices are still in the market.

Key strategies for success include:

1. Coordination with Existing Programs:

- Collaborate with existing large-scale government programs, especially those leveraging DPIs, to integrate and streamline digital literacy efforts seamlessly.

2. Leverage Synergies:

- Bundle digital literacy initiatives with digital financial services and digitally enabled primary healthcare to create synergies and provide a more holistic approach to users.

3. Scale Through Integration:

- Integrate basic digital literacy efforts, such as PMGDISHA, into broader government initiatives to ensure scalability and wider reach.

4. Public Messaging and Coordination:

- Ensure clear, transparent, consistent, and trusted public messaging to convey the importance and benefits of basic digital literacy. Coordinate efforts to avoid duplication and optimize impact.

5. Results-Based Accreditation:

- Implement a results-based accreditation system that includes regular check-ins, feedback loops, and practical assessments to gauge the effectiveness of digital literacy courses.

6. Practical Application:

- Emphasize the practical application of acquired digital literacy skills, ensuring that users can apply their knowledge in real-life scenarios.

7. Feedback Mechanisms:

- Establish effective feedback mechanisms to continuously improve digital literacy programs based on user experiences and evolving needs.

By taking these actions, the government can ensure the success and impact of digital literacy initiatives, contributing to the reduction of the adoption gap in rural, lower-income, and less-educated demographics. Coordination, integration, and a focus on practical application and results-based accreditation will be instrumental in achieving these goals.

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

Our Response:

To ensure widespread access and effective utilization of digital literacy tools, a collaborative and open approach is recommended. Here are key strategies that involve the government, World Bank (WB), TRAI, DoT, MEITY, and other civil society organizations:

1. Open Access and Repositories:

- Make digital literacy tools open and available to all by creating repositories. Ensure that these tools are easily accessible to the public, possibly through platforms like UMANG (Unified Mobile Application for New-age Governance), enhancing their reach.

2. Customization with WB Support:

- Collaborate with the World Bank to produce and customize content for digital literacy initiatives. Leverage the expertise and resources of the WB to enhance the quality and relevance of educational materials.

3. Integration into Government Apps:

- Integrate digital literacy tools into government apps, such as UMANG, to make them readily available to a wider audience. This helps leverage existing platforms for distribution.

4. Engagement with Civil Society Organizations:

- Utilize the public sector roles of TRAI, DoT, and MEITY to engage and coordinate with civil society organizations. Leverage their last-mile distribution networks, including mobile network operator (MNO) retail branches, government ration shops, and utility offices.

5. Awareness Campaigns:

- Coordinate efforts with civil society organizations to conduct awareness campaigns in collaboration with TRAI, DoT, and MEITY. These campaigns should focus on promoting digital literacy tools and offerings.

6. Targeted Outreach:

- Leverage devolved powers at the national and local levels to coordinate efforts for targeted outreach. Use "trusted faces in local places" such as government officials, community leaders, and local influencers to connect with individuals and businesses in need of digital literacy support.

7. Public-Private Partnerships:

- Explore public-private partnerships to enhance the distribution and accessibility of digital literacy tools. Engage with private entities that have established networks and distribution channels.

8. Monitoring and Evaluation:

- Implement robust monitoring and evaluation mechanisms to assess the effectiveness of outreach efforts. Gather feedback from the target audience to continuously improve and tailor digital literacy initiatives.

By adopting these strategies, the government can maximize the impact of digital literacy programs by ensuring broad access, customization, effective distribution, and targeted outreach. Collaborative efforts involving government agencies, international organizations, and civil society entities contribute to a comprehensive and inclusive approach to digital literacy promotion.

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.

Our Response:

The messaging around digital literacy needs to extend beyond basic skills, emphasizing the broader aspects of motivation and confidence, as well as the ability to apply digital skills effectively in various aspects of life and work. The World Bank (WB) is actively studying global best practices in digital literacy to formulate strategic recommendations tailored to the needs and opportunities in India and other South Asian countries. The WB seeks to involve the Telecom Regulatory Authority of India (TRAI) as a key informant stakeholder through interviews for this initiative, with plans to share recommendations upon completion.

Prominent global best practices identified thus far include:

1. Engagement with Employers:

- Collaborating with employers early in the process to enhance the absorption of women into the digital workforce. This has been successfully implemented in countries like Kenya and the Philippines.

2. Industry Collaboration for Outreach Trainings:

- Working closely with industry players such as Airbnb, Uber, and eCommerce platforms to conduct outreach trainings for women and members of marginalized groups. The focus is on enabling participation in the gig/platform economy and eCommerce. This approach has seen success in Southeast Asia and Latin America.

3. Bundling Programs with Financial Services:

- Bundling digital literacy and digital financial literacy programs with financial services and device purchase schemes. This targeted approach aims at women, the unbanked/low banked, and

other marginalized sections of society, as seen in successful implementations in Nigeria and Ghana.

These practices highlight the importance of a holistic approach to digital literacy that goes beyond skill acquisition. Involving employers, collaborating with industry players, and bundling programs with financial services can contribute significantly to increasing digital literacy and empowerment, especially among women and marginalized groups. TRAI's participation in informing these efforts ensures a comprehensive understanding of the local context and needs, fostering effective and targeted interventions.

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.

Our Response:

Effectively monitoring the impact of Digital Public Infrastructures (DPIs) on underserved and vulnerable segments of society is imperative for ensuring their success and inclusivity. The following steps should be taken to establish a comprehensive monitoring framework:

1. Define Clear Objectives:

- Establish clear and specific objectives for DPIs, particularly focusing on their impact on underserved and vulnerable populations. These objectives should be measurable, time-bound, and aligned with broader digital inclusion and socioeconomic development goals.

2. Data Collection and Analysis:

- Gather baseline data on digital access, skills, and socioeconomic status among the target populations before implementing DPIs. This baseline serves as a reference point for assessing changes over time.

- 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:

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

- Organize focus group discussions and qualitative interviews to delve deeper into the impact of DPIs, capturing nuanced insights and personal stories from the beneficiaries.

4. Digital Skills and Usage Patterns:

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

- Analyze data on how underserved communities are utilizing digital services. Understand which services are most used and how they contribute to their daily lives.

5. Partnership with Research Institutions:

- Collaborate with academic and research institutions to conduct in-depth studies on the impact of DPIs. These studies should employ rigorous research methodologies to provide valuable insights.

6. Regular Impact Assessments:

- Plan and conduct regular impact assessments at defined intervals (e.g., annually or biennially). These assessments should cover a wide range of indicators and include both quantitative and qualitative data.

7. Incorporate User Stories:

- Adopt a user-centric approach by incorporating 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:

- Involve community leaders and Community Advisory Groups (CAGs) in the monitoring process. They can offer valuable input, facilitate communication, and help gather community perspectives.

9. Regular Reporting and Transparency:

- Publish regular reports on the impact of DPIs, sharing findings, successes, challenges, and future plans. Transparency in reporting builds trust and accountability among stakeholders.

By diligently following these steps, the monitoring of DPIs will be comprehensive, incorporating quantitative and qualitative data, community perspectives, and real-life stories to ensure a thorough understanding of their impact on underserved and vulnerable populations.

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.

Our Response:

In the realm of digital literacy programs, integrating decision-making support and leveraging emerging technologies can significantly enhance the effectiveness and scalability of these initiatives:

1. In-App Decision-Making Support:

Customer Nudges: Implement decision-tree algorithms within digital literacy apps to provide in-app decision-making support. These algorithms can guide users through learning paths, offering tailored suggestions based on their progress and challenges.

Interactive Guidance: Utilize decision-tree structures to create interactive decision-support modules within the app, assisting users in navigating digital literacy content and addressing specific queries.

2. Big Data and Deep Learning for Macro-Level Assessment:

Comprehensive Data Capture: Leverage Big Data to capture information on different cohorts participating in digital literacy training nationwide. This data can include demographics, learning styles, and progress metrics.

- Before-and-After Literacy Improvement: Apply Deep Learning algorithms to analyze large-scale data sets, allowing for the assessment of before-and-after literacy improvement on a national scale. This macro-level analysis can provide insights into overall program effectiveness.

3. Consistent Content and Delivery Improvement:

- Continuous Evaluation: Use data analytics to continuously evaluate the effectiveness of digital literacy content and delivery methods. Analyzing large datasets can reveal patterns and trends that help in refining and enhancing program elements.

- Adaptive Learning Paths: Implement Deep Learning algorithms to create adaptive learning paths within digital literacy programs. These paths can dynamically adjust based on individual user progress, ensuring personalized and effective learning experiences.

4. Emerging Technology for Decision Support:

- Artificial Intelligence (AI): Integrate AI technologies to offer personalized recommendations and adaptive content delivery based on individual learning preferences and performance.

- Virtual Assistants: Implement virtual assistants within digital literacy apps to provide real-time support, answering queries, and offering guidance during the learning process.

5. Government and Stakeholder Decision-Making Support:

- Policy Formulation: Use data analytics to inform government policy formulation related to digital literacy. Insights from large-scale assessments can guide decision-makers in allocating resources and shaping effective strategies.

- Resource Allocation: Utilize data-driven insights to optimize resource allocation for digital literacy programs, ensuring that efforts are focused on areas with the greatest need.

6. Scaling Digital Literacy Efforts:

-Predictive Analytics: Apply predictive analytics to anticipate future digital literacy needs and challenges. This foresight can aid in proactively developing scalable solutions and adapting programs to evolving technological landscapes.

-Scalable Content Development: Use Deep Learning algorithms to develop scalable and adaptive digital literacy content. This ensures that content remains relevant and effective for diverse learner cohorts.

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?

Our Response:

Throughout history, a student's education has been confined to the resources available within the physical confines of their school. Technology-enabled learning has the transformative potential to break these limitations, allowing learners to access resources and expertise from anywhere in the world, beginning with their own communities. However, the integration of information technology in education still faces significant challenges. Information technology stands as a crucial tool in enhancing access to quality education and elevating literacy rates in a country.

According to a survey conducted in over 1500 US schools, technology emerges as the most significant focus area for school innovation in the next 1-2 years. Nevertheless, a substantial digital divide exists, mirroring similar conditions in India. Urban schools generally enjoy better access to resources compared to their rural counterparts, and further divisions persist within urban areas, favoring metropolitan schools over those in smaller cities. Addressing these disparities requires targeted government programs to ensure equal access to educational resources.

However, having resources alone is insufficient without the knowledge and capability to utilize them effectively. Emerging technologies cannot contribute significantly to education and learning

without a focus on improving the understanding of technology fundamentals. Teacher training becomes a pivotal area to enhance digital literacy.

Efforts in these key areas are essential to ensure that digital literacy is not just a theoretical concept but a practical reality. A comprehensive digital literacy program must involve simultaneous improvements in the mentioned key areas to enhance the skills necessary for accessing digital resources.

Policies need to be crafted to promote fair and ethical use of Artificial Intelligence (AI) and new technologies. This includes measures to prevent discrimination and bias in technological applications, as well as ensuring the security and privacy of users. Investments should be directed towards developing new technology that is accessible, affordable, and inclusive. Crucial infrastructure must be established to guarantee access to high-speed and stable internet connectivity. By addressing these aspects, a holistic approach can be taken to bridge the digital divide and ensure that the benefits of technology in education are accessible to all.

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?

a) Digital Connectivity

b) Digital Affordability

c) Digital Literacy

Our Response:

Measuring, monitoring, and tracking the progress of digital inclusion initiatives is essential for ensuring their effectiveness. Key Performance Indicators (KPIs) play a crucial role in evaluating the impact of these initiatives and guiding decision-making. Here are key factors of digital inclusion along with corresponding KPIs to measure progress:

1. Internet Access:

Percentage of Population with Internet Access: Measure the population percentage with internet access 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.

2. Digital Literacy and Skills:

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

Digital Literacy Assessment Scores: Measure improvements in digital skills through assessments, tracking 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, indicating affordability.

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

4. Usage and Adoption:

Frequency of Internet Use: Measure how often individuals use the internet, indicating higher adoption rates with regular usage.

Number of Transactions Conducted Online: Track online transactions to assess the adoption of digital services.

5. E-Government Services:

Number of E-Government Service Users: Measure citizen usage of online government services.

User Satisfaction with E-Government Services: Gauge user satisfaction with the quality and accessibility of e-government services through surveys.

6. Inclusivity:

Digital Inclusion Index: Develop a composite index considering factors like access, skills, and affordability to measure overall digital inclusion progress.

Targeted Population Participation Rates: Measure 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.

8. Digital Safety and Security:

Cybersecurity Incidents: Monitor reported cybersecurity incidents and breaches, along with 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 participation in workshops, events, and online discussions.

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

Regularly monitoring these KPIs enables policymakers and organizations to assess the effectiveness of digital inclusion initiatives, identify areas for improvement, and adjust strategies 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?

Our Response:

Ensuring high-speed broadband connectivity for schools in regions with limited internet infrastructure is crucial for advancing educational opportunities and digital literacy. To achieve this goal, the following measures can be implemented:

1. Needs Assessment and Planning:

School Internet Mapping: Conduct a thorough survey and mapping of schools lacking 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, choosing the most suitable options based on geographical and infrastructural conditions.

2. Public-Private Partnerships:

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

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

3. Infrastructure Development:

Fiber Optic Expansion: Invest in expanding fiber optic networks to connect schools in remote areas, ensuring high-speed and reliable internet connectivity.

Wi-Fi Infrastructure: Establish Wi-Fi networks within schools for seamless connectivity, facilitating easy access to educational resources.

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, ensuring connectivity in geographically isolated areas.

5. Digital Education Platforms:

Offline Access: Implement offline digital education platforms accessible without a continuous internet connection, periodically updating when internet access is available.

Educational Content Servers: Set up local servers within schools hosting educational content, enabling resource access without relying on external internet connections.

6. Community Engagement:

Community Internet Centers: Establish community internet centers near schools, serving as hubs for digital learning for both students and local residents.

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

7. Government Initiatives and Funding:

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

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

8. Capacity Building:

Teacher Training: Provide training to teachers on utilizing digital resources and integrating technology into teaching methods, emphasizing digital literacy for effective use of internet resources.

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

9. Regular Monitoring and Support:

Regular Performance Monitoring: Implement a monitoring system to track internet connectivity performance in schools, addressing 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?

Our Response:

A dashboard serves as a highly effective tool for evaluating and tracking progress in the realm of digital inclusion due to several key reasons:

1. Centralized Data Visualization:

Data Aggregation: Dashboards aggregate data from diverse sources, offering a centralized view of multiple indicators. This simplification aids policymakers in interpreting complex data for informed decision-making.

2. Real-Time Monitoring:

Timely Updates: Dashboards offer real-time or near-real-time updates, enabling continuous monitoring. Timely data is crucial for prompt decision-making and adjusting strategies based on current trends.

3. Customization and Drill-Down Capabilities:

Customizable Metrics: Dashboards can be tailored to display specific metrics aligned with the goals of digital inclusion initiatives.

Drill-Down Functionality: Users can delve into specific data points, providing detailed insights for identifying trends, challenges, and areas requiring intervention.

4. Data Transparency:

Transparency: Dashboards enhance transparency by making data accessible to stakeholders, fostering trust and accountability in digital inclusion efforts.

5. Performance Monitoring:

Key Performance Indicators (KPIs): Dashboards display KPIs related to internet access, digital skills, affordability, and usage patterns, offering a clear understanding of program performance.

Comparative Analysis: Dashboards facilitate the comparison of data over time or across regions, aiding evidence-based decision-making.

6. Decision Support Tool:

Informed Decision Making: Dashboards serve as decision support tools, providing data-driven insights to policymakers for effective resource allocation and improvement identification.

7. User Engagement and Accountability:

Engagement: Public access to dashboards encourages citizen engagement, fostering community involvement and accountability among stakeholders.

8. Early Warning Systems:

Alerts and Notifications: Dashboards include alert systems to notify stakeholders when metrics fall below or exceed predefined thresholds, allowing for timely interventions.

9. Continuous Improvement:

Feedback Loop: Dashboards facilitate a feedback loop where data informs the refinement of digital inclusion strategies, ensuring adaptability for greater effectiveness.

10. Resource Optimization:

Resource Allocation: Data from dashboards guides resource allocation, directing funding, training programs, and infrastructure investments to areas with the greatest need.

In summary, a well-designed dashboard is a powerful instrument for evaluating and tracking progress in digital inclusion initiatives. It offers actionable insights, supports evidence-based decision-making, enhances transparency, and engages stakeholders, 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?

Our Response:

Effective evaluation and tracking of digital inclusion initiatives require collaborative efforts among various stakeholders. These entities share responsibilities to ensure a comprehensive, transparent, and efficient monitoring process. Here are the key stakeholders and their roles:

1. Government Agencies:

Policy Formulation: Formulate policies related to digital inclusion, setting goals, objectives, and indicators.

Data Collection: Collect official data on internet penetration rates, digital literacy levels, and access to online government services.

2. TRAI (Telecom Regulatory Authority of India):

Data on Connectivity: Collect data on internet connectivity, broadband penetration, and the quality of services provided by ISPs to track availability and quality of internet access.

3. Local Government and Municipalities:

Infrastructure Development: Play a role in developing infrastructure, expanding broadband networks, establishing public Wi-Fi hotspots, and ensuring internet access in public spaces.

4. Educational Institutions:

Digital Literacy Programs: Engage in digital literacy programs, providing data on the number of students trained, digital skills assessment scores, and technology integration into the curriculum.

5. CAGs (Civil Society Organizations) and Community Groups:

Community Engagement: Work closely with local communities, collect qualitative data, conduct surveys, and engage in community-based digital inclusion initiatives.

6. Private Sector and ISPs:

Data on Internet Usage: Provide data on internet usage patterns, customer demographics, and user behavior.

Partnerships: Collaborate with government and NGOs to sponsor digital literacy programs, offer subsidized devices, and support infrastructure development.

7. Research Institutions and Academia:

Research and Analysis: Conduct studies, surveys, and analysis on digital inclusion trends and challenges, offering inputs for policymaking and program evaluation.

8. Technology and Data Analytics Experts:

Dashboard Development: Design digital inclusion dashboards, integrating data sources and ensuring functionality.

9. Citizens and Communities:

User Feedback: Provide valuable qualitative data through feedback, experiences, and participation in surveys, ensuring programs align with the actual needs of the population.

10. International Organizations and Donors:

Funding and Support: Provide funding, expertise, and technical support for digital inclusion initiatives, supporting research, capacity-building, and innovative projects.

Collaboration and coordination among these stakeholders through regular meetings, data sharing, and feedback loops ensure that digital inclusion initiatives are comprehensive, well-informed, and responsive to evolving community needs. Involving citizens and communities in the evaluation process enhances inclusivity and effectiveness.

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?

Our Response:

a. We assert that Telecom Service Providers (TSPs) are currently delivering dependable and swift digital connectivity to Micro, Small, and Medium Enterprises (MSMEs).

b. With the impending implementation of 5G, promising high-speed connectivity, TSPs are well-positioned to offer reliable digital connectivity to MSMEs at an affordable cost.

c. We contend that MSMEs, integral to the country's economic development, can greatly benefit from the initiatives undertaken by TSPs to provide high-speed broadband, extending even to remote areas.

d. The challenges faced by MSMEs in rural or remote areas mirror those encountered by other marginalized sections, with the affordability of devices being a significant concern. We posit that the measures recommended for addressing device affordability in preceding sections are equally applicable to MSMEs. This is crucial for achieving digital accessibility, thereby advancing digital inclusion.

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?

Our Response:

Certainly, leveraging the BharatNet project is a viable option. Please refer to the response provided to question number 7 for insights into the widespread adoption of broadband facilitated by BharatNet at an affordable cost.

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

Our Response:

Digital Public Infrastructures (DPIs) play a pivotal role in facilitating access to modern technologies for marginalized communities and Micro, Small, and Medium Enterprises (MSMEs).

a) Open Data Infrastructure DPIs, such as government open data platforms, digital identity, and payments architectures, offer small businesses a seamless integration into these frameworks, enabling the creation of innovative, scalable services tailored for marginalized communities.

b) Participation-centric DPIs, emphasizing open APIs, sandbox environments, and community collaboration, empower developers from underprivileged backgrounds to address local challenges faced by marginalized groups through relevant solutions.

c) Strategic partnerships with entities like the National Small Industries Corporation, a Government Enterprise, simplify access for millions of small businesses to Connectivity, Conferencing, Cloud, and Security solutions.

d) Establishing digital school infrastructure becomes crucial to fostering inclusion at the foundational level, ensuring that educational opportunities are accessible to all.

e) Evolving regulations over time is essential to strengthen norms, adapting to the dynamic nature of technology and digital landscapes.

To enhance technological participation, DPIs should proactively incorporate inclusivity principles, including vernacularity, affordability, and accessibility. Standardized interfaces should be made available for MSMEs and communities to develop localized solutions.

A notable example of such inclusive infrastructure is the Open Network for Digital Commerce (ONDC), a network connecting various stakeholders in the digital commerce value chain. It links manufacturers, suppliers, logistics providers, and consumers, offering secure payment options and logistical support, contributing to a more inclusive digital commerce ecosystem.

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.

Our Response:

As we transition into a post-AI world, a critical question emerges regarding the intersection of 5G technology and the accessibility of Artificial Intelligence (AI) solutions, particularly for Micro, Small, and Medium Enterprises (MSMEs). While 5G stands as a connectivity network technology, its potential will be fully realized through collaborative efforts as diverse use cases and applications are developed over time. Simultaneously, ensuring affordable and ethical AI solutions for MSMEs becomes a key consideration.

In order to facilitate widespread access to AI/ML solutions for MSMEs, a collaborative approach is imperative. Government bodies such as the Ministry of Commerce, Small Scale Industries, and related entities, along with trade bodies and associations representing SMEs and MSMEs, must join forces. Together, they can formulate policies and initiatives aimed at providing affordable access to unbiased and ethical AI solutions.

Organizing workshops and training programs becomes a valuable strategy in this context. These initiatives can serve to educate MSMEs about the potential applications of AI in their specific domains, promoting awareness and understanding of how these technologies can enhance efficiency, productivity, and competitiveness. Workshops can also provide insights into ethical considerations surrounding AI, ensuring responsible and fair use.

In addition to governmental and institutional efforts, the onus is on entrepreneurs and startups to contribute to the democratization of AI. Developing simple yet effective AI solutions tailored to the needs of MSMEs is crucial. This approach prevents AI from becoming the exclusive domain of large corporations, fostering a landscape where a diverse range of businesses can benefit from AI technologies.

Encouraging innovation within the MSME sector is not only about developing AI solutions but also about creating an ecosystem that supports experimentation, learning, and adaptation. Collaboration between government bodies, trade associations, and entrepreneurs can help create an environment conducive to the growth of AI adoption among MSMEs.

In summary, the integration of 5G and AI represents a transformative potential for MSMEs. A collaborative effort involving government bodies, trade associations, and entrepreneurial ventures

is essential to ensure affordable, unbiased, and ethical access to AI solutions. Workshops and educational initiatives play a pivotal role in raising awareness, and the development of user-friendly solutions by startups contributes significantly to democratizing the benefits of AI for the broader business community.

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.

Our Response:

The success of a digital inclusion policy hinges on the establishment of a clear governance framework for implementation. It is crucial to recognize that barriers to mobile internet adoption are interconnected, and addressing them in isolation is insufficient. Existing policy initiatives often suffer from fragmentation, primarily because responsibilities are distributed among different ministries, regulators, and agencies, each dealing with various factors influencing digital inclusion.

Effective policy strategies acknowledge the cross-cutting nature of digital inclusion and advocate for a holistic approach through a whole-of-government paradigm. Adopting such an approach entails a cross-sectoral and cross-organizational perspective in formulating and implementing digitalization policies and frameworks. This approach encourages collaborative efficiencies, streamlining decision-making processes, and offers substantial benefits, including cost savings through the avoidance of redundant efforts and ensuring inclusivity by considering diverse stakeholder perspectives.

To embrace a whole-of-government approach, policymakers need to prioritize collaborative governance models that garner support for digital inclusion initiatives across ministries, regulatory bodies, and all participants in the digital ecosystem, including non-government entities. Some governments have established action task forces or formalized multi-stakeholder platforms to enhance coordination among internal and external stakeholders, promoting strategic priorities and implementing actions to advance digital inclusion.

Addressing the gender digital divide requires specific organizational structures and processes to effectively integrate gender goals and considerations into strategies, policies, plans, and budgets. This may involve creating councils, steering committees, champions, or gender focal points that include relevant departments and stakeholders. Regular, impartial evaluations are crucial to understanding the impact of policies on women, and these insights should inform adaptations to digital inclusion strategies. These evaluations should assess whether women are benefiting proportionately from policy interventions or if unintended negative consequences are experienced.