Digital India and Technological Advancements: Critical Analysis

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ABSTRACT:

Digital India initiative was launched by the Government of India on July 01, 2015 with the objective of transforming India into a digitally empowered society and knowledge economy. This programme encompasses the key visions as the digital infrastructure as a utility to every citizen, Governance and services on demand and digital empowerment of citizens. This paper represents an overview of the concept of Digital India initiative, 9 pillars of Digital India as well as Digital India initiatives and the challenges related to the new technological advancements or innovations which have been introduced to demonstrate a consistent upward growth, achieving numerous milestones and programme initiatives. According to the report published by the India's Council on India's Digital Economy 2024, our nation comes on the third place in terms of digitalisation of the economy. With the aim of achieving the vision of "Viksit Bharat" i.e. developed India by 2047, the Government has formulated a comprehensive plan for fostering the inclusive growth, enhancing innovations and other strategic initiatives.

Keywords: Digital economy, digital empowerment, enhancing innovations, digital infrastructure.

INTRODUCTION:

Digital India is a flagship programme of the Government of India, launched on July 1, 2015, by Honourable Prime Minister Shri Narendra Modi with the vision to transform India into a digitally empowered society and knowledge economy. Digital India has been improving the lives of all citizens through the digital delivery of services, expanding the digital economy and employment opportunities.

The Digital India programme has demonstrated a consistent upward growth trajectory, achieving numerous milestones and flagship initiatives. These accomplishments span a wide array of sectors, including developing broadband highways, universal access to mobile connectivity, public internet access programmes and digital governance.

The future of Digital India is poised for remarkable advancements, leveraging emerging technologies to further drive innovation and growth. The ongoing commitment to digital transformation will continue to enhance service delivery, promote inclusive growth and strengthen India's position as a global leader in the digital economy. With sustained efforts and strategic initiatives, Digital India is set to redefine the socio-economic landscape of the nation, fostering a brighter, more connected future for all citizens.

OBJECTIVES OF THE STUDY:

1. To describe the concept of Digital India.
2. To analyse the pillars of Digital India.

3. To critically examine the digital India initiatives related to technological advancements.
4. To analyse the challenges in implementation of the digital India initiative in context to technological advancements.
5. On the basis of findings, we suggest some future policy formation for effective implementation of the Digital India initiative.

LITERATURE REVIEW:

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- Gajanan B. Haldankar. (2018). Digital India – A key to Transform India, ISN 2320-2882. This paper helps to understand the concept of digital India,vision of digital India, the pillars of the campaign, opportunities and also the challenges that might affect the successful implementation of the program.
- Dr. Giridhari Mohanta, Dr. Sathya Swaroop Debasish, Dr. Sudipta Kishore Nanda (2017). A Study on Growth and Prospect of Digital India Campaign ISSN 2415-6663. The objective of this paper is to know the impact, challenges of digital India on all aspects of governance and improvement in the quality of life of citizens.
- Kuldeep Kumar (2018). REVIEW ON DIGITAL INDIA INITIATIVE AND CHALLENGES, ISSN NO: 2249-7455 International Journal of Management, Technology And Engineering. This research paper also considers the major challenges in implementation of digital India such as internet speed, Cloud services, Threat to Network, E-Commerce related issues.
- Suraj Pratap Singh (2021). A Vision of Digital India: Its Negative& Positive Impact on Indian Society ISSN (Online) 2581-9429 International Journal of Advanced Research in Science, Communication and Technology (IJARSCT). Digital India program is an initiative to form technology access to every citizen of the country with a vision to rework India in to a digitally empowered country.

RESEARCH METHODOLOGY:

This research study is based on the secondary data sources. Therefore, the information is fetched from various secondary data sources like websites, journals, reports and published materials from the web.

▪ **CONCEPT OF DIGITAL INDIA:**

The Government of India launched the Digital India campaign in order to make the services of the government available to all the citizens of the country through electronic infrastructure and improved internet connectivity. This will lead to the empowerment of the people of the country digitally through technological advancements.

The main focus of this flagship programme is to technology central for enabling change for the betterment of the society.

Source: digitalindia.gov.in

This programme weaves together a large number of ideas and thoughts into a single, comprehensive vision so that each of them is seen as part of a larger goal. Each individual element stands on its own. But is also part of the larger picture. It is coordinated by DeitY, implemented by the entire government. The weaving together makes the Mission transformative in totality.

VISION OF DIGITAL INDIA:

This programme is centred on key focus areas:

- Digital inclusion and accessibility
- Supporting digital entrepreneurship
- Technology for good governance
- Innovation
- Capacity building and skill development

SERVICES OFFERED THROUGH DIGITAL INDIA:

1. **DIGITAL INFRASTRUCTURE AS A UTILITY TO EVERY CITIZEN-**
A. **High speed internet as a core utility:** The provision of high-speed internet, elevated to the status of a fundamental utility akin to water or electricity, stands as the lifeblood of the digital age, ensuring every citizen's seamless integration into the global digital tapestry.
B. **Cradle to grave digital identity:** An unbroken, lifelong digital identity—uniquely tailored and eternally verifiable—serves as the cornerstone of one's virtual existence, granting secure and consistent access to a myriad of online services throughout the entirety of life's journey.
C. **Mobile phone and bank account:** As the essential instruments of modern digital and financial participation, the mobile phone and bank account serve as gateways, unlocking the realms of communication, digital interaction, and economic empowerment.
D. **Easy access to a common service centre:** A meticulously crafted network of Common Service Centres emerges as the connective tissue between the digital and the tangible, extending the reach of governmental and digital services, even to those who may not possess personal digital devices.
E. **Shareable private space on a public cloud:** The provision of a personal, secure enclave within the vast expanse of the public cloud empowers individuals to curate, manage, and share their digital treasures with fluidity and assurance, reflecting the modern ethos of digital autonomy.
F. **Safe and secure cyber space:** A fortified digital sanctuary that shields its denizens from the perils of cyber threats, safeguarding privacy, data integrity, and the sanctity of one's digital engagements, thus fostering a climate of trust and security in the virtual world.

2. GOVERNANCE AND SERVICES ON DEMAND-

A. Seamlessly integrated across departments or jurisdictions: Ensuring that services are harmoniously interconnected across various departments and jurisdictions, fostering a unified and efficient digital ecosystem**.**

B. Real time service availability on online and mobile platforms: Providing services in real-time through online and mobile platforms, ensuring instant access and responsiveness for all users.

C. Cloud accessibility for all citizen entitlements: Making every citizen's entitlement readily available on the cloud, ensuring easy access and secure storage in a centralized digital repository.

D. Digitally transformed services for enhanced ease for doing business: Transforming services through digital innovation to streamline processes, thereby significantly enhancing the ease of conducting business.

E. Electronic and cashless financial transactions: Transitioning financial transactions to electronic and cashless modes, promoting efficiency, transparency, and modern financial practices.

F. Utilising GIS for Decision support and development: Employing Geographic Information Systems (GIS) as a critical tool for informed decision-making and strategic developmental planning.

3. DIGITAL EMPOWERMENT OF CITIZENS-

A. Universal digital literacy: Fostering a culture of digital literacy that empowers every individual to navigate the digital landscape confidently and competently.

B. Universally accessible digital resources: Ensuring that digital resources are accessible to all, breaking down barriers and promoting inclusivity in the digital realm.

C. Cloud Accessibility for All Documents and Certificates: Making all essential documents and certificates readily available in the cloud, providing secure and convenient access for every user.

D. Digital resources and services available in Indian Language: Offering a wide range of digital resources and services in Indian languages, enhancing accessibility and understanding for diverse populations.

E. Collaborative digital platforms for participative governance: Establishing collaborative digital platforms that encourage active citizen participation in governance, fostering transparency and community engagement.

F. Portability of all entitlements through the cloud: Enabling the seamless portability of all citizen entitlements via the cloud, ensuring that individuals can access their benefits anytime and anywhere.

9 PILLARS OF DIGITAL INDIA:

1. **BROADBAND HIGHWAYS-** This is the first pillar of digital India initiative which aims to cover 250 thousand village panchayats and the main area of focus will be the development of new communication infrastructure in the urban areas.

2. **UNIVERSAL ACCESS TO MOBILE CONNECTIVITY-** This pillar basically focuses on increasing the reach of the network and filling the gaps in connectivity around the country. Around 55,669 villages in India do not have mobile coverage yet.

3. **PUBLIC INTERNET ACCESS PROGRAMME-** The two components of the Public Internet Access Programme are Common Service Centres (CSCs) and Post Offices as multi-service centres. CSCs would be strengthened and their number would be increased from approximately 1,37,000 operational at present to 2,50,000 i.e. one CSC for each Gram Panchayat.

4. **E- GOVERNANCE REFORMING GOVERNMENT THROUGH TECHNOLOGY-** This was one of the most important initiatives which focused on using the technology sources in order to develop the government services through internet. Online repositories for various certificates, educational degrees, identity documents, etc. should be mandated so that citizens are not required to submit these documents in physical form.

5. **E- KRANTI ELECTRONIC DELIVERY OF SERVICES-** This pillar focused on the areas like E- education, E- healthcare, Technology for farmers, Technology for farmers, Technology for farmers, Technology for security, Technology for Financial inclusion and Technology for justice.

6. **INFORMATION FOR ALL-** Open Data platform and online hosting of information & documents would facilitate open and easy access to information for citizens. The government shall proactively engage through social media and web-based platforms to inform citizens. MyGov.in has already been launched as a medium to exchange ideas/ suggestions with the Government. It will facilitate 2-way communication between citizens and government.

7. **ELECTRONICS MANUFACTURING-** This goal requires coordinated action on many fronts like taxation incentives, economies of scale, incubators, skill development, consumer and medical electronics.

8. **IT FOR JOBS-** The main aim of this pillar is to provide training to the one crore students from small towns and villages for IT sector jobs over 5 years. The second component focuses on setting up Business Process Outsourcing services (BPOs) in every northeastern state to facilitate ICT-enabled growth in these states. Under the third component, the focus is on training three lakh service delivery agents as part of skill development to run viable businesses delivering IT services. The fourth component focuses on training of five lakh strong rural workforce for the Telecom Service Providers (TSPs) to cater to their own needs.

9. **EARLY HARVEST PROGRAMMES-** This pillar includes the programmes for developing a mass messaging platform that will cover elected representatives and all the government employees. 1.36 Cr mobiles and 22 lakh emails. Biometric Attendance system for all central Govt. offices. It also includes development of Public Wi-Fi hotspots, SMS based weather information and National portal for Lost and Found children.

DIGITAL INITIATIVES IN RELATION TO TECHNOLOGICAL ADVANCEMENTS:
Technological advancements are one of the most important initiatives which was formulated under the Digital India Campaign. The following is the list of initiatives formulated by the Government of India:

1. **Development of Centre of Excellence for Gaming, VFX, Computer Vision & AI at Hyderabad:** This was the first initiative taken under the category of technology advancements in collaboration with the Telangana government, the Software Technology Park of India, the Ministry of Electronics and IT, and the gaming industry. The main aim of this initiative is to offer resources to offer resources to start-ups in the fields of gaming, animation, VFX, computer vision, and AI through proper allocation of funds, technology support and mentorship.

2. **Centre of Excellence on Virtual & Augmented Reality (VARCoE) at IIT Bombay:** Virtual reality and augmented reality (VR and AR) provide enormous promise for innovation in a wide range of sectors and scientific domains. Currently, research and innovation activities are being conducted in a number of areas, including productivity software, art and architecture, transportation,

construction, tourism, health and medical sciences, product and skill development, entertainment and education.

3. **National Programme on Artificial Intelligence:** As we see a rapid pace of technological changes, introduction of Artificial Intelligence is seen as one of the important technology upgradations in the field of innovations and new start ups are being encouraged to promote innovation, inclusion and adoption for social impact. The Ministry of Electronics and Information Technology (MeitY) of India is implementing this National Programme on Artificial Intelligence in order to achieve this goal of adoption of Artificial Intelligence in all the sectors of the market. It consists of four main pillars namely the National Centre on AI, Data Management Office, Skilling in AI, and Responsible AI.

4. **Global Partnership on Artificial Intelligence:** The Global Partnership on Artificial Intelligence (GPAI) aims to foster productivity, growth and prosperity of the nation through continuous development in the technological changes in order to achieve the global level in the adoption, innovation, creativity and inclusion. On 15th June India made itself as the founding member of Artificial Intelligence and submitted a nomination to become the next council chair of GPAI, positioning itself as one of the biggest economies in the Global South and a leader in the AI race.

5. **POC for Artificial Intelligence Research Analytics and knowledge dissemination:** This project was launched by the Government of India to provide a platform for shared computer programming for the overall operation of Artificial Intelligence. This introduced the AI research labs, innovation hubs, scientific community, industry, startups. With a large, power-optimized AI cloud infrastructure connecting all Centers for Research Excellence in Artificial Intelligence (COREs), Indian Centers for Transformational AI (ICTAIs), and other Academic, Research Labs, Scientific Community, Industry, and start-up institutions with National Knowledge Network, this AIRAWAT PoC of 200 Petaflops Mix Precision AI Machine will act as a common computational cloud platform for Big Data Analytics and Assimilation.

6. **Design, Development and Deployment of National Artificial Intelligence Portal (INDIAai):** The digital India initiative launched the e portal for Artificial intelligence related information and subjects and therefore aimed at solving all the problems related to AI. This will lead to foster leadership, excellence, promote economic expansion and enhance people lives. Along with this, AI related case studies, reports and studies are being uploaded on regular basis on the portal (https://indiaai.gov.in/).

7. **Centre of excellence on block chain technology at Gurugram**: Other than AI, the next main area of technological advancement is the introduction of the block chain technology. The Centre of Excellence in Blockchain Technology operates as a coordinated, interoperable blockchain ecosystem across the country. It is a gateway to test and develop the best solutions for projects undertaken by NIC at the Centre and State levels. Intending to foster stronger collaboration between the government, public and private sectors, CoE in Blockchain Technology promotes the use of blockchain technologies and facilitates rapid adaptation and onboarding of solutions.

8. **Artificial Intelligence Committees Report**- Artificial Intelligence (AI) is expected to change the way we work and live. In view of its positive impact on the economy, technology is being embraced by countries across the world. Its proliferation is being regarded as the fourth industrial revolution. From time to time, the government of India has also expressed the intention to support research and

the adoption of technology. In view of the possible impact of AI on the economy and society and to develop a policy framework on AI, MeitY constituted the following four committees on AI.

HYPOTHESIS OF THE STUDY:

H0: Internet Literacy and implementation of digital India initiatives related to technological advancements are independent.

H1: Internet Literacy and implementation of digital India initiatives related to technological advancements are interdependent on each other.

## CHALLENGES OF DIGITAL INDIA INITIATIVE RELATED TO TECHNOLOGICAL ADVANCEMENTS:

1. INTERNET LITERACY: One of the most challenging factors for implementing the technological advancements related to AI, block chain and cryptocurrency is the internet literacy of the people of our country. According to ASSOCHAM- Deloitte report on Digital India, November 2016, around 950 million Indians are still not on internet. In 2021, India had a rank of 73 out of 120 countries for internet literacy. As per the below mentioned graph, only 25% of the rural households are digitally literate and 61% of the urban households are digitally literate which comes to 38% of the total households are digitally literate.
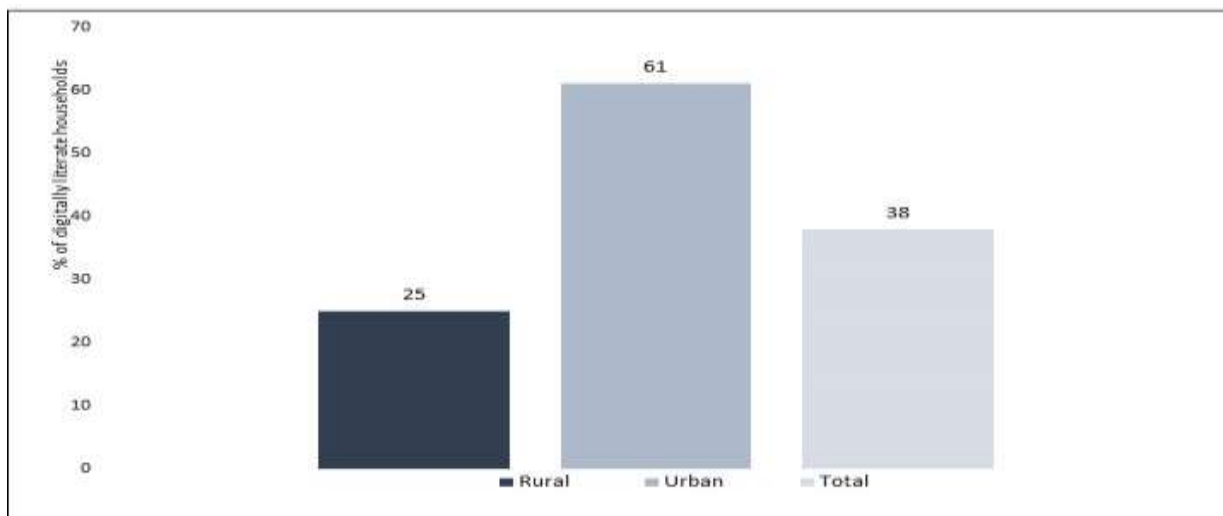
Source: NSS data author's calculations (ideasforindia.in) The digital dream upskilling India for future.

2. INTERNET PENETRATION RATE: As we can see, that the internet penetration rate in India has rose at 52.4% by the year 2024 but internet usage in India has yet to reach its full potential. Despite of the fact that urban population internet usage has tremendously increased but the rural India is still unaware of the internet services as well as a tangible gender gap is one of the reason for not installing internet and mobile connections in the rural population.

Internet penetration rate in India from 2014 to 2024
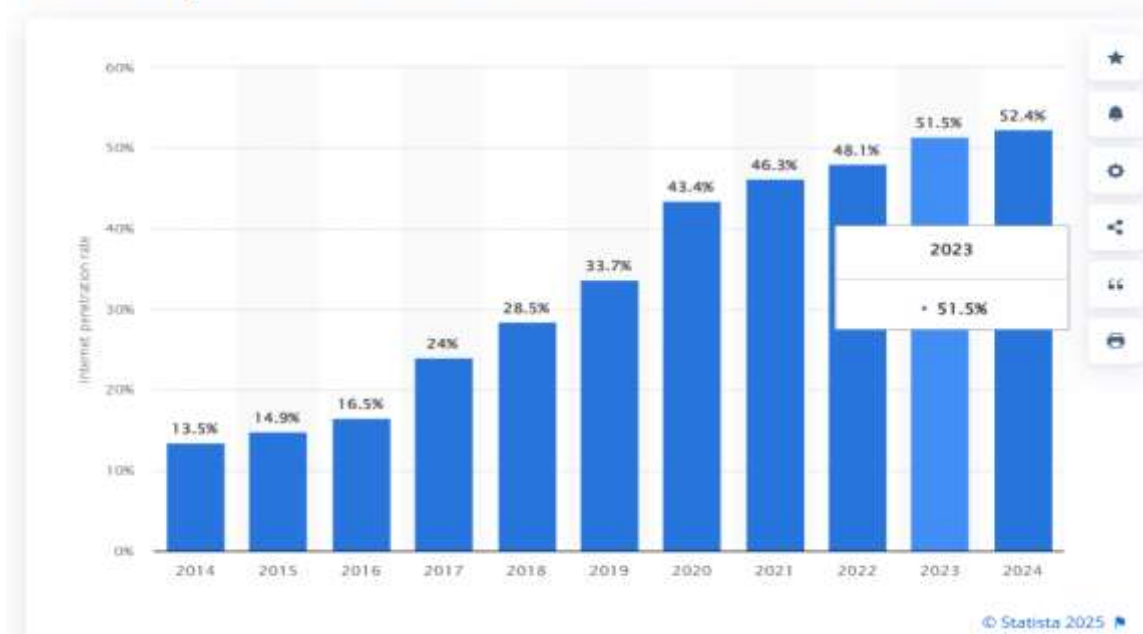
Source: statistica.com

3. RURAL-URBAN GAP IN CONTEXT TO INTERNET PENETRATION:

As we can see that India has 58% of the rural-urban gap in the population of India. This gap is calculated as the difference between the rural and urban penetration rates, divided by the overall population rate. This is one of the major challenges of the implementation of the technological related initiatives under digital India.

Urban-Rural Gap
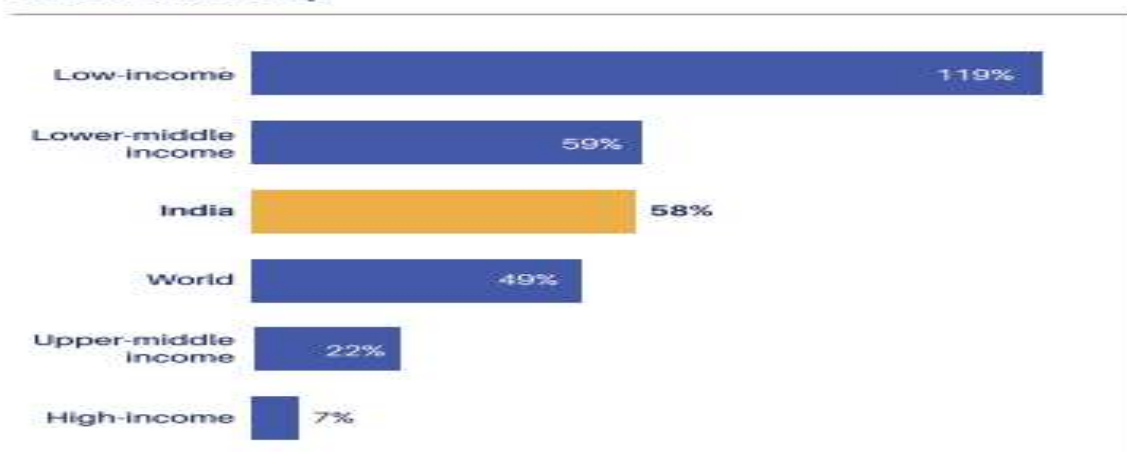
Source: statistica.com

4. INCREASE IN CYBER CRIME FRAUD IN INDIA:

In the below mentioned data, it is observed that the number of Cyber Crime cases registered from the year 2002 to 2022 in India is around 33798k which is one of the most challenging factors for making India a digitalised economy in terms of technological advancements through application of AI, blockchain and cloud computing in India.

Source: www.ceicdata.com (National Crime Research Bureau)

5. STRUGGLE FOR THE SMALL & MEDIUM SCALE INDUSTRIES/ ENTERPRISES IN REGARD TO OPERATING THROUGH DIGITAL PLATFORM:

In the below graphs, it is observed that the small and medium scales industries have been facing difficulties in implementing the new technology advancements in their businesses due to lack of capital funds. Therefore, India is standing on the second last position where around 50% small scale industries are operating through digital platform and around 60% of the medium scale industries are operating through digital platform. Henceforth, the high cost implementation of the advanced technology becomes a hurdle for the businesses.
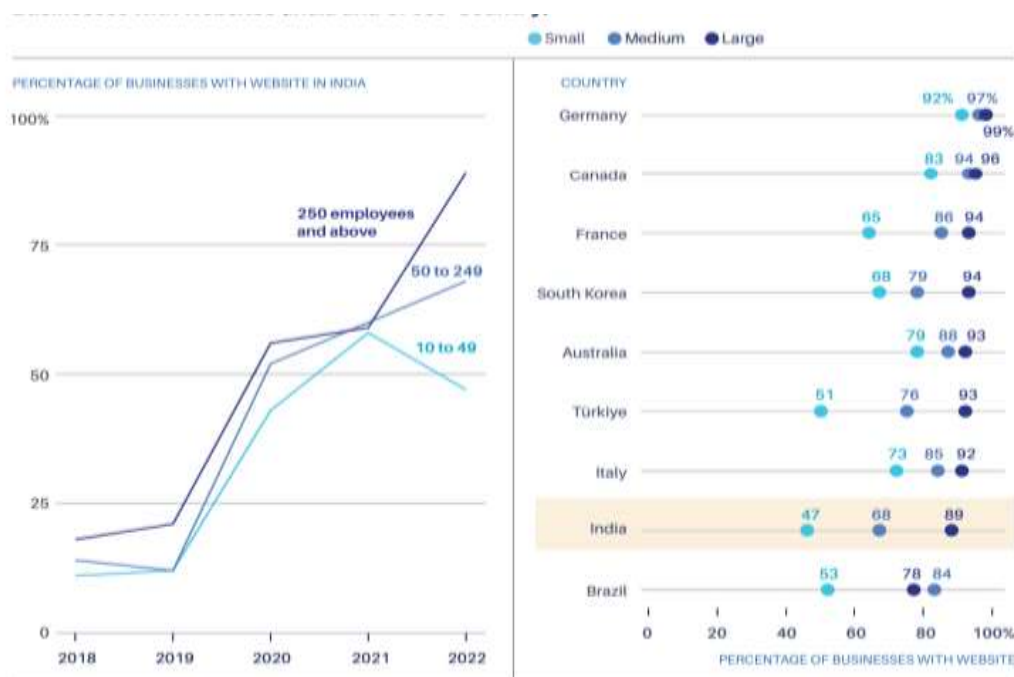
Source: OECD Statistics (2023/2022) and Kantar (2022) for India

FINDINGS OF THE STUDY:

- This programme weaves together a large number of ideas and thoughts into a single, comprehensive vision so that each of them is seen as part of a larger goal. Each individual element stands on its own.
- There is a wide range of services available for all the citizens of the country.
- The 9 pillars of the digital India initiative becomes the base for the formulation and implementations of the digital India initiatives.
- The initiatives related to technological advancements are focused more on diversifying and developing the usage of AI and blockchain technology.
- There are various challenges for the implementation of digital India initiatives related to technological advancements likewise internet literacy, internet penetration, high cost implementation, skilled manpower, cyber crime fraud etc.
- On the basis of the data related to the first challenge i.e. Internet literacy rate in India, it is found that the H0 hypothesis is rejected and H1 hypothesis is accepted. Therefore, it is concluded that Internet Literacy and implementation of digital India initiatives related to technological advancements are interdependent on each other.

SUGGESTIONS OF THE STUDY:

- Firstly, the Government should make such policies which will be helpful in reducing the urban-rural gap in the population in order to achieve the goals of digitalised economy.
- Then, the efforts should be made to increase the internet literacy rate, so that the people of the society are able to access the internet products or services.
- The Government should formulate plans for the increasing the awareness about the digital India initiatives among the rural population, so that the rural population is also able to access the digital products & services.
- The Digital India initiatives formulated by the Government are only focused on some technological advancements like Artificial intelligence and block chain technology only instead there are some major areas where initiative is must i.e. infrastructure development including digital platforms also so that the rural people are able to achieve the bracket of internet literacy and skill development which are needed to use the Artificial Intelligence, block chain and cloud computing system.
- Lack of skilled manpower is also one of the major concerns which are needed to operate the digital India initiatives. Therefore, the Government policies should focus more on rural India so that they are also able to avail the digital services.
- The measures should also be formulated to reduce the mobile traffic over the internet in order to maintain the speed of the internet or WiFi services.

CONCLUSION:

The Government of India launched the Digital India campaign in order to make the services of the government available to all the citizens of the country through electronic infrastructure and improved internet connectivity. This will lead to the empowerment of the people of the country digitally through technological advancements. There is a wide range of services available for all the citizens of the country. The 9 pillars of the digital India initiative becomes the base for the formulation and

implementations of the digital India initiatives. The initiatives related to technological advancements are focused more on diversifying and developing the usage of AI and blockchain technology.

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