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Barriers And Impact of Digitalization in Rural Areas- A Case Study

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Abstract

Digitalization has revolutionized economies and societies globally, but its implementation in rural regions is confronted with specific challenges. This case study investigates the challenges to digitalization in rural regions and its effects on economic development, education, healthcare, and social inclusion. The study also identifies potential strategies to overcome the digital divide.

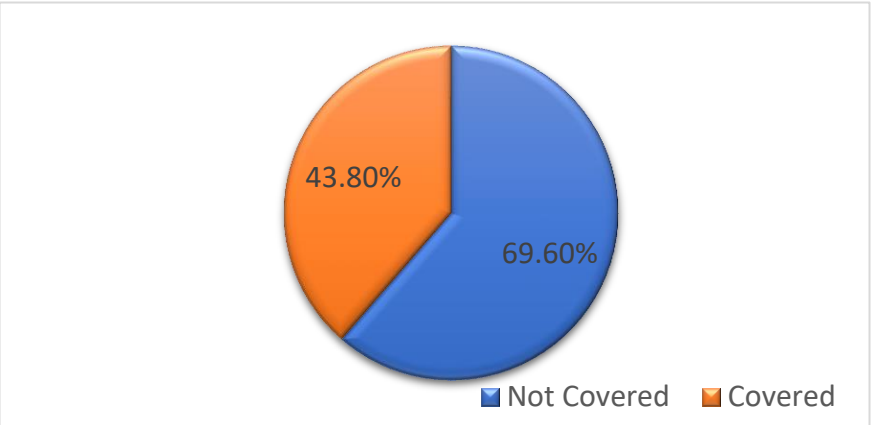
Keyword: Digitalization, Economic development, Revolutionized, Social inclusion

Introduction

In the healthcare industry, digital usage and the implementation of modern technologies improve the growth in the health sector. The new technologies bring better health procedures in which they control mass data and reduce costs. Several factors contribute to the development of healthcare, and they also determine barriers from the perspective of the patient, clinician and the organizational model *(Suresh and Natarnjan,2024)*. Digitalization is the process of integrating digital technologies into day-to-day life and business processes. Though urban regions have embraced digital changes at a quick pace, rural regions tend to lag behind owing to infrastructural, economic, and social reasons. This research discusses a rural area's process of digitalization, the critical hurdles, and assesses the socio-economic implications.

Barriers to Digitalization in Rural Areas

1. **Limited broadband connectivity and mobile network coverage to many villages-** According to "Bharat Broadband Network Limited" project only **199655** villages are covered out of **655968** so the **remaining 456313** villages are still not covered with broadband connectivity. *(bbnl ,2025).*



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2. **High cost of infrastructure development in remote areas** - Rural India infrastructure costs are high as a result of a number of factors such as low population densities, hard geographies, non-availability of skilled manpower, complexity of acquiring land, shortage of existing infrastructures, the necessity for distant connectivity, among other factors which result in relatively higher construction and maintenance costs for rural India when compared to an urban region. *(Chaurey & Trung le, 2022)*
3. **High costs of digital devices and internet services-** In rural India, the exorbitant price of digital equipment such as smartphones and computers, as well as that of internet services, is a major obstacle to access, allowing for a "digital divide" where many residents lack the means to afford going online, largely because of low incomes, low population densities, and the high infrastructure expenses of carrying connectivity to far-flung locations. (*ACT,18th march, 2024)*
4. **Limited funding and investment in digital initiatives** - Low investment and limited funding for digital projects in rural India are largely attributed to inadequate infrastructure, low rural population digital literacy, perceived low ROI in the rural setting, geographical difficulties in accessing remote villages, and a general absence of awareness concerning the possible advantages of digitalization in rural India, resulting in a deep "digital divide" between urban and rural India. *(Sato, 2024)*
5. **Preference for traditional business and communication methods**- In India, there remains a liking for conventional business and communication practices owing to reasons such as strong personal relationship orientation, vast rural population with limited access to the internet, cultural norms favoring face-to-face communication, hierarchical business organization, and overall familiarity with standard practices despite growing usage of digital technologies.*(Chegg,2024)*

Digitalization in various fields in India:(*source- Shobana & Kumar,2024***)**

The term "digitalization" refers to the process of transferring analog data or processes into a digital format, which entails modifying and improving operations, services, or goods using digital technology.

1. **Digital Payments**: The transition from cash-based transactions to electronic payment methods is facilitated by digital technology. Digital payments have undergone a revolution since the Unified Payments Interface (UPI) was implemented in India. (*NPCI, 2019*).
2. **E-Governance**: The provision of information, communication, and government services to citizens through the use of digital technology. The Government of India's

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"Digital India" plan seeks to create a society in which technology is empowering. (*Government of India, 2015*).

3. **E-Commerce:** Digital platforms enable the purchasing and selling of products and services over the internet. By enabling online buying, platforms like Flipkart and Amazon India have changed the retail scene. (*Kumar et al., 2020*).
4. **Digital Education**: The use of digital technology to facilitate learning and education through online platforms Initiatives like the National Digital Library of India provide access to a vast repository of educational resources. (*NDLI, n.d.*).
5. **Telemedicine:** The provision of healthcare services remotely through digital communication technologies During the COVID-19 pandemic, telemedicine saw a surge in adoption in India, enabling patients to consult with doctors online. (*Government of India, 2020*).
6. **Smart Agriculture**: The use of digital technology, data analytics, and IoT devices to optimize agricultural practices. The use of precision agriculture techniques and IoT sensors to monitor soil health and automate irrigation (*ICAR, 2021*).

Emergence of Digitalization in India:

India started opening up its economy and making it more open to globalization in the early 1990s, and that was when the nation's digitization started. That was when information technology (IT) and the software services sectors started booming and when key centers of technology like Bangalore started surfacing. The National Informatics Centre (NIC), established in 1976, played an important role in promoting digitalization efforts by providing e-governance solutions.

Impact of digitalization in various fields in India:

1. **Education:** Increased Access: E-learning platforms have expanded access to quality education, especially in remote and underserved areas. In 2020, the e-learning market in India was valued at approximately USD 247 million, and it is expected to grow at a CAGR of 24% from 2021 to 2026 (Research and Markets, 2021). Not all students have access to digital devices or reliable internet connectivity, creating a disparity in access to online education (*UNICEF, 2021*).
2. **Healthcare:** Digital health platforms have facilitated remote consultations and healthcare services. During the COVID-19 pandemic, telemedicine consultations increased significantly, reaching 319% growth in April 2020 compared to the previous year (*Practo Insights, 2020*).

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3. **Agriculture:** Digital technologies like IoT and AI are being used for precision farming, optimizing resource use. Precision agriculture can lead to a 20-25% increase in crop yields and a 30% reduction in water usage (*FICCI, 2019*).
4. **Finance and Banking:** Digital banking and payment systems have contributed to financial inclusion. As of 2020, India's digital payment transactions accounted for 34% of total non-cash transactions (NITI Aayog, 2020). The rise in digital transactions has also led to an increase in cybersecurity threats. In 2020, India experienced a 37% increase in cyberattacks compared to the previous year (*CERT-In, 2021*).

Some state government run project on ICT are: -

- **Warana Project- The** Prime Ministerís Office Information Technology (IT) Task Force introduced Warana "Wired Village" project in the year 1998. The main aim was to improve the efficiency and productivity of the sugar cane co-operative. To achieve this aim by providing a wide range of information and services to beneficiaries from 70 villages around Warana, this project utilised 150 state-of-the-art computer networking nodes and internet facilities.

  This project provided the villagers with access to information about crops, market prices, government employment schemes, revenue records, health schemes, credit schemes and educational opportunities in their local language. The implementation is done through the facility centres established in the villages. It also links the villages to the Warana cooperative complex. As a result, the villagers gained easy access to knowledge and information from across the world through the National Informatics Centre Network.
- **Gyandoot Project**- Introduced in Madhya Pradeshís Dhar district on 1st January, 2000, Gyanoot is a unique e- governance project that was economical as well as self-sustainable. The project was introduced with 21 telecentres in the village councils of 5 blocks of the district. Over a period of time, 600 villages in Madhya Pradesh introduced this project to establish easy communication with rural people through information kiosks. Many people are depending on the kiosks to get information about a verity of government services. The farmers can easily access to the variation in prices of agricultural produce in different markets. The project was found successful in the initial years post implementation, and was awarded the Stockholm challenge information technology (IT) award in 2000 for public service and democracy. But the subsequent evaluations of the project revealed lack of enthusiasm and poor delivery. So, sustainability of the project needs more comprehensive efforts.

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Problems and Challenges in Implementation of digitalisation in rural India

Illiteracy, lack of awareness, financial problems, lack of skill development, inadequate infrastructure like frequent power cuts, poor internet connectivity, etc., digital poverty and language dominance are the major problems in the implementation of digitalization in rural India. Beyond these, it is also challenging because of the basic human nature of resisting

change and hesitation to revolutionise.

Strategies to Overcome Barriers

- Expansion of affordable internet infrastructure.
- Government and private sector collaborations.
- Digital literacy campaigns and community training programs.
- Financial support through subsidies and grants for digital tools (McKinsey, 2022).

Conclusion

Digitalization holds immense potential for transforming rural areas by fostering economic growth, improving education, and enhancing healthcare services. However, overcoming barriers such as poor infrastructure, economic constraints, and digital illiteracy requires a multi-stakeholder approach. Addressing these challenges can pave the way for inclusive and sustainable development.

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