Journal of Information Systems Engineering and Management
2024, 9(4s)
e-ISSN: 2468-4376
https://www.jisem-journal.com/

Research Article

India's Digital Governance Landscape: Technological Transformation in Public Administration Through ICT

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ARTICLE INFO

Received: 02 Jul 2024
Revised: 18 Aug 2024
Accepted: 27 Aug 2024

ABSTRACT

Technology has continuously evolved to enhance human capabilities, streamline processes, and transform societies. The shift from mechanical to digital systems has led to the widespread adoption of digital transformation across industries, including governance. Digitalisation has emerged as a revolutionary tool for enhancing governmental efficiency through E-governance, which integrates information and communication technology (ICT) into public administration. This study explores the role of digital transformation in Indian governance, analysing the evolution of E-governance, its impact on efficiency, and key initiatives like Aadhaar, Digital India, and BharatNet. A qualitative research approach is adopted, leveraging secondary sources of data like government reports, academic literature, and case studies. The research highlights how E-governance facilitates transparency, efficiency, and inclusivity while addressing challenges like digital literacy and linguistic diversity. By examining India's digital transformation journey, this study contributes to understanding the potential of E-governance in fostering effective governance and equitable development.

Keywords: Digital Transformation, E-Governance, Information and Communication Technology (ICT), Digital India.

1. INTRODUCTION

Technology is the art of easing human effort and revealing the latent potentialities and unimaginable possibilities that were thought to be impossible at some point in human history (Raghaviah, 2015). It has always existed in some or the other form since the beginning of human evolution (Arthur & Polak, 2006). Technology in other words is a process of transforming ideas into a comprehensible form. It refers to the application of scientific knowledge, tools, techniques and systems to provide solutions to enhance efficiency and improve the effectiveness of human life. Technology exists in the usage of a gas stove to the flying of a rocket into space. The evolution of technology has transformed itself from mechanical and analog systems to digitalisation. Digital transformation has become a magical wand that integrates digital technologies into all aspects of an organisation, industry, or government to fundamentally change the way of operations and value delivery (Bennett & Yiu, 2019). It involves adopting and adapting emerging technologies like Big Data analytics, Cloud computing, the Internet of Things (IoT), Block Chain, and Artificial Intelligence (AI), to improve efficiency, decision making ability and create innovative products and services. The United States officially recognised 'Electronic Government' as a concept in 1993.

India is a land of highest population in the world backed up by different cultures, traditions, regions, religions and governing practices. In other words it can be called a world in itself as it houses the number of varieties of practices otherwise found in the entire world. As a nation the governing bodies in India have been experimenting various modes of governance to foster a homogenous administration. Digitalisation has emerged as a transforming tool to enable E-governance, which leverages information and communication technology (ICT) like the internet, mobile devices, and other digital platforms to improve governmental operations, engagement with citizens, accountability and transparency of public administration.

E- governance is an instrument to replace manual, paper based bureaucratic systems with computerisation and AI driven digital governance. This research paper attempts to analyse the role of digital transformation in enhancing the

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efficiency of governance through E-governance. It also tries to examine the historical evolution and development of E-governance in public administration in India. Using a qualitative research approach, this study uses secondary data viz., academic literature, media content, and case studies of E- governance practices in India.

2. METHODOLOGY

Qualitative research is well-suited for examining the nuanced and context-dependent phenomena related to governance and digital technologies (Creswell, 2013). This approach allows for a comprehensive analysis of digital transformation's socio-cultural, organizational, and policy dimensions. The primary sources of data for this study includes academic journal articles, books, government reports, and relevant online databases. Key sources are drawn from reputable journals in public administration, information systems, and digital governance, This is evident in leading academic publications like Journal of Public Administration Research and Theory, Government Information Quarterly, and Public Management Review (Bryman, 2016). Add-ons from international organisations like the World Bank and the United Nations provide insights into global digital governance practices (UN, 2020; World Bank, 2021).

Data collection for this study involves a systematic review of the literature. This process includes identifying relevant keywords related to digital transformation, governance efficiency, and public administration. Comprehensive searches in academic databases such as Google Scholar, PubMed, and JSTOR to gather related literature (Boell and Cecez-Kecmanovic, 2015). The journals selected for the literature were from the publications during the last decade to ensure the relevance and correlation of the data.

3. LITERATURE REVIEW

1947 marked the beginning of self governance in modern India which was indigenously segregated into many divisions that were individually governed by respective states (Jennings, 2011).The Independent India faced challenges, obstacles and ignorance in its proper governance. The adoption of a five year plan strategy, acceptance of Indian constitution, industrial policies, and division of electorates were some of the administrative tools to govern India into a developed nation (Panagariya, 2010). The implementation of new economic policy marked a major shift in India's economic structure by embracing Liberalisation, Privatisation, and Globalisation. This policy facilitated the growth of E- governance by opening the economic doors to foreign investment and promotion of technology driven development (Harindranath & Liebenau, 1995). Liberalisation helped the removal of government restrictions on businesses and allowed investments leading to the rapid growth of the IT sector (Mathur, 2006). FIIs and FDIs were a welcome investment in IT infrastructure, telecom, and software development that invariably laid a strong foundation for E-governance (Kumar, 2005). National Informatics Centre (NIC) and Railway computerisation in 1995 were epitomic towards digitising paper based processes and public services (Taneja & Agrawal, 1985). Privatisation diluted the governmental monopoly on many nation building sectors like electricity, telecom, mining and steel, chemicals and pharmaceutical industries to mention a few. Globalisation on the other hand helped India integrate with the global economy to adopt international best practices in digital governance. Global companies were allowed to collaborate and establish themselves in India through cutting-edge technology that raised IT hubs in Bengaluru, Hyderabad, Mumbai, Pune etc., (Balatchandirane, 2007). The IT Act of 2000 was influenced by global cyber security standards that enabled secured digital transactions in Indian governance. The government of Andhra Pradesh launched E- seva model in 2001 that paved the way for digital service delivery (K.S., 2012). Several other E-governance initiatives like Bhoomi project launched in 2000 by Karnataka government helped in digitalising land records (Chawla, 2004); E-courts launched in 2005 helped in managing online judiciary cases (Sarkar & Bhattacharjee, 2023); Launched in 2006, the National e-Governance Plan (NeGP) marked a pivotal shift by institutionalizing 31 mission-mode projects, including e-Districts and e-Courts, to digitize core services (Kumar, 2012). The New Economic Policy (NEP) directly and indirectly enabled the expansion of telecom, IT parks and internet connectivity (Sinha, 2016). BharatNet launched in 2011 was India's rural broadband project that aimed at connecting villages with E-governance services (Sharma & Pandey, 2015). This evolved into the ambitious Digital India initiative in 2015, aiming to connect 600 million rural citizens and transform India into a digitally empowered society (Anooja, 2016). Programs like these that got operational since 2013, exemplify this shift, leveraging biometric identification and banking infrastructure to streamline welfare delivery (Schauder, 2020).

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4. EVOLUTION OF E-GOVERNANCE IN INDIA.

The world today is referred to as a 'Global Village', a term coined by Marshall McLuhan and is meant to be synonymous with the concept of world's new electronic interdependence. This era of digitalization does not allow anyone to imagine a government without a digital tool or a digital system of governance (Sen, 2016). The term E-governance was an outcome of the success of E-commerce in representing a public sector equivalent to e-commerce (Csetenyi, 2000). India's diversity is not only visible in its people and practices but also in its gender distribution and geographical division (Jayal, 2006). The vulnerability of these segregations became even more marginalized economically and socially after the implementation of the New Economic Policy (Weber, 2004). These vulnerabilities are credited for an early acceptance of E-governance in India. The accepted changes triggered various administrative reforms that not only improved the quality of life of the communities, but they were able to provide them with more economic opportunities and equitable access. E-Governance synonymous with ICT initiatives have enhanced access to services, lowered expenses, curbed corruption, provided timely assistance, and broadened outreach to previously underserved populations. (Das & Chandrashekhar, 2007). E-governance initiatives are reaching out to Individuals from diverse socio-economic backgrounds across various regions of the country (Anand & Khemchandani, 2019). Greater access to information and services has bolstered economic and social development opportunities (Singh, 2015), facilitating communication and participation in decision-making processes and empowering the weaker sections of society (Fung & Wright, 2001). E-governance has fostered a sense of ownership and helped improve social capital that has a strong foundation for rejuvenating the local economy and transparent governance to all strata of society (Das & Chandrashekhar, 2007).

4.1 Below is the chronology of the evolution of E-governance in India:

1995 - Launching of Internet in India
1998 - Establishment of Department of Information Technology, GOI, E-procurement, StateData Centre, Common Service Centers, State-wide Area Network,National Taskforce of Information Technology and Software Development.
2006 - Sanction of approval to National E-governance Plan (NeGP)
2007- Broadband Launch
2009- Expansion of Broadband connections reached 2.99 million.
2010 - Introduction of 3 G Services
2015 - Introduction of 4 G services
2016 - Announcement of Smart Cities concept, Digital payment drive, UPI (Unified Payments Interface), Aadhaar-Enabled Payment System (AePS), BHIM (Bharat Interface for Money) App, DigiLocker Expansion.
2017- UMANG (Unified Mobile Application for New-age Governance. A mobile a platform for accessing 100+ government services across the department, viz., EPFO (Employment Provident Fund), PAN services, Passport applications; eNAM (National Agriculture Market)
2018 - Ayushman Bharat Digital Initiatives such as Pradhan Mantri Jan Arogya Yojana, Telemedicine services; E-Courts 2.0 - Virtual courtrooms and online case tracking systems.
2019 - BharatNet Phase 2 (Expanding Rural Digital Connectivity); FASTag for Digital Toll Collection
2020 - Aarogya Setu Aap; CoWIN Portal; National AI Portal
2021 - E-RUPI (A digital voucher-based payment system for direct benefit transfers (DBT); Drone Rules.
2022 - Account Aggregator Framework (A data sharing system to securely share financial data with banks, insurance companies, and fintech firms).
2022 - Launching of 5G Network
2023 - National Single Window System, Bhashini (AI-powered Language Translation)
2024 - Digital Personal Data Protection Act (DPDP Act).

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These digital advancements accelerated the swift growth of e-governance under the Digital India initiative.

5. ROLE OF DIGITAL TRANSFORMATION IN ENHANCING GOVERNMENT EFFICIENCY THROUGH E-GOVERNANCE

Digital transformation in governance has become the new normalcy. Innovations and the changes in the expectations of the citizens compelled the governments to transform governance from traditional methods to digital modes. Digital transformations are harnessing cutting-edge technologies to modernize and develop India on par with the developed nations of the world. It is widely recognized as a pivotal factor to enhance efficiency and effectiveness of governance (OECD, 2016). It has become such an initiative that reduces bureaucratic hurdles and promotes transparency, ultimately fostering and improving citizen's access to government services (Vassil, 2015). Moreover, digitalization enables governments to leverage data analytics for better decision-making through the utilization of big data and predictive analytics, public institutions anticipate citizen needs, optimize resource allocation, and address issues proactively (Mergel, Edelmann, and Haug, 2019). This data-driven approach not only improves the responsiveness of public services but also strengthens decision-making processes and builds trust between the government and its constituents by demonstrating a commitment to informed and effective governance. This growth of knowledge is vital for practitioners, policymakers, and the wider audit community. For practitioners, it serves as a strategic tool for designing and implementing digital transformation projects, making them maximise impact (Gasco-Hernandez et al., 2022). Policymakers may use of the insights to craft policies that encourages interdepartmental cooperation and the development of integrated digital infrastructures, there by optimizing the use of public resources (Van Noordt & Misuraca, 2022). For auditors, this provides a structured approach to evaluate the performance of digital initiatives and assess their effectiveness, enabling more accurate and actionable recommendations (Chung & Kim, 2019). Tackling these challenges results in government services that are more effective, transparent, and accountable, thereby strengthening public confidence and improving overall societal welfare.

6. SUCCESSFUL INITIATIVES OF E-GOVERNANCE IN INDIA

E-governance has become an important tool that helps the government as well as the citizens to communicate, participate, and have transparency in the execution and implementation of welfare schemes and programs. Listed below are some of the E-governance initiatives that has transformed the way of governance.

NICNET – National Informatics Centre Network enables facilities for supporting services, projects and programmes in the special work areas. Speedy Court Cases Trials through video conferencing in Bihar; redressal of public grievance through video conferencing in Chhattisgargh; AGMARKNET – provides global market to Indian agriculture; Rural Soft helps in implementing povery alleviation schemes in rural areas; SMART Nagarpalika is an ICT framework for functioning of administrations of Municipal Corporations; EPanchayat helps in panchayat administration; SERMON facilitates intranet solutions for the Central Excise Revenue Collection; SARATHI and VAHAN provides SMART revolution in road transport sector of India; CARD, STAR, PEARL, CORD, HARIS, PRISM softwares help in property registration; BHOOMI- Project revolutionised the land records system by digitising data and establishing touch-screen kiosks across all talukas, enabled farmers to get their revenue documents by paying nominal user fee of ₹15. BHUMI, TAMILNILAM, BHOOLEKH, HIMBHOOMI, BHUIYA, APKAK, DHARNI etc., help in computerization of land records; Egranthalya helps in library automation and networking to usher in "India- a Knowledge Society"; HOPTS helps in transaction processing system in the Indian Postal System (McKinsey, 2019). KAVERI (Karnataka Valuation and e-registration Project): It is the Karntaka's first public private in the domain of e-Governance. It is designed in away that it is not a financial burden to government. The initiative aims to digitize more than 200 sub-registrars across the state and has enabled property registration to be completed within 30 minutes of document submission, a significant improvement from the previous 45-day processing period

Aadhaar, uses biometric authentication to provide a unique ID to 1.3 billion citizens, enabling seamless integration across services like banking, welfare, LPG, and taxation. India's e-governance model is predominantly centralized, with Aadhaar serving as the backbone. It links identity to over 650 government schemes, such as Direct Benefit Transfer (DBT), which delivers subsidies directly to bank accounts, reducing leakages by 20% (MeitY, 2020). Artificial intelligence (AI) plays a growing role—CoWIN, a cloud-based platform, managed 2 billion COVID-19

vaccinations with real-time tracking, showcasing scalability ().These initiatives showcase India's ambition to digitize at scale.

7.CHALLENGES OF IMPLEMENTING E-GOVERNANCE

India stands among the fastest-growing economies globally and has secured the 58th position in the Global Competitiveness Index, which has been five places up since 2017 (Global Competitiveness Report, The World Economic Forum, 2018). Achieving equitable growth continues to be a pressing concern. The government is enthusiastic about authentic and reliable digitisation to bring in economic inclusivity and drive social transformation through initiatives like "Digital India", "Make in India", and Skill India. This resulted in it entering an era of increased digitisation, moving towards 4th generation of industry, powered by new-age technologies such as the Internet of Things (IoT), Artificial Intelligence (AI), and Robotics. Yet, the peak of success is not free from challenges.

India is a nation marked by the Kaleidoscopic variety, with 22 officially recognised languages spoken across 29 states and six union territories. Most of the applications in E-governance are in English, which is understood by only 10.35% of the Indian population ("List of countries by English-speaking population", 2015.). Thus making it a challenge to transform applications into more than one language. India's literacy level (This includes the capacity to interpret and utilize language, numeracy, visual representations, and other tools essential for engaging with the prevailing symbolic systems of a culture.), as per the Census, 2011 is 74.04% which becomes an obstacle in the implementation of E-governance projects ("Ranking of States in India by Literacy Rate," 2015, para. 3). Digital literacy is non-existent among more than 90% of India's population ("National Digital Literacy Programme", 2015). Citizens are not aware of the governance facilities, which is enhancing the challenge of educating ignorant citizens. More than 6.5 lakh villages in India are remotely located and isolated from computer technology, creating hurdles in the implementation of e-governance. A poverty-ridden population, low per capita income, and fluctuating inflation rates are add-ons to the challenges of the successful implementation of e-governance in India.

8. CONCLUSION

The analysis of best practices in digital transformation highlights the importance of the integration of advanced technologies in public services to enhance governance efficiency through improved service delivery and increased citizen engagement. Through technologies of E-governance platforms, big data analytics, and smart technologies, government institutions have successfully addressed bureaucratic inefficiencies and fostered transparency and accountability in public administration. E-governance has significantly promoted transparency and accountability in public administration, playing a crucial role in advancing technological development within developing nations. Its core aim is to create equal opportunities for global interaction and access. By leveraging digital platforms, countries can enhance governance and work toward building a more progressive and inclusive society.

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