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Technology as a Tool of Economic Development: A Review of E-Governance Initiatives in India

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ABSTRACT

With the advent of Information and Communication Technology (ICT), there has been a rapid initiation of a global information society. ICT is changing people's lives, ways of communication, work culture, and participation in decision-making. In the contemporary period, the role of technology has become more significant in communication, governance, and overall economic development. E-governance is about using (ICT) to make various government services available to people. Digital India has brought a revolutionary change in delivering government services to its citizens using electronic mediums, even in remote areas, by improving high-speed internet connectivity and related infrastructure. This paper explores the emergence and role of ICT in governance over the years. Benefits and challenges in implementing e-governance, especially digital delivery of services, creation of digital infrastructure, and digital literacy, have been discussed.

Key Words : Technology, E-governance, Economic Development, Digital India

INTRODUCTION

The emergence of technology has a great impact on human thinking and functioning. There is a paradigm shift towards the digital revolution. Technology has blurred the lines between the digital and biological domains (World Economic Forum, 2016). In the era of digital technology, smartphones, computers, tablets, and laptops are leading equipment that use the internet to connect to the world of information. Earlier information was stored in the form of text, but the scenario has changed now. Information technology has brought a revolutionary change in information generation, presentation, and dissemination. ICT is the convergence of three revolutions: Electronics, Computing, and Communications (Al-Shalabi, 2005). In e-governance, 'e' denotes electronic, and 'Governance' is about linkages between government and its role in politics, society, and administration. 'E-governance' is about using Information and Communication Technology (ICT) to provide government services. It includes dissemination of information, administration, democratic process, government transactions, and integration of previously existing services and information portals (Dawes, 2008). It is the application of technology in all interactions between citizens, private business, and government, as well as across the departments of government so as to simplify procedures and provide better governance (Kettl, 2002). This paper explores the transformation from e-government to e-governance, the 'Digital India' program, its benefits, and challenges.

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Research Objectives

Objectives of this paper have been derived from a review of existing literature. The main objectives of this paper are to understand the use of technology for economic development and governance and to explore the implications of e-governance initiatives for economic development and governance in India. This paper is descriptive. It describes various concepts such as digital India and e-governance and their implications at the ground level. This paper discusses the idea of e-governance, its pillars, e-governance initiatives of the Government of India, and issues and challenges associated with e-governance. Secondary data sources such as journals, research papers, books, government annual reports, and magazines have been referred to conceptualize e-governance and digital India programs for economic development and better governance.

Historical Evolution of E-Governance

India has made steady progress in the area of e-governance. It was initiated in the year 1970 with the establishment of the Department of Electronics followed by the National Informatics Centre (NIC) in the year 1977. By 1980, the process of making government offices equipped with computers was taking place at a very fast pace. In the initial years, the usage of these computers was confined to word processing. In 1987, the first national satellite-based network, equipped with database services was launched by the National Informatics Centre (NICNET). Over the years the purview of NICNET extended from state to district headquarters. The "Reinventing the Government" drive during the 1990s called for drastic and paradigm change in the functioning of government. Bureaucratic procedures had to be replaced by customer-driven and result-oriented procedures (Osborne and Gaebler, 1992). In the late 1990s, the acceptance of ICT rapidly entered all domains of government. The invention and expansion of wireless networks and advanced search tools further increased the usage of several Web-based applications (Dawes, 2008). In the year 2000, the Ministry of Information Technology was established and it initiated a 12-point agenda for implementation of e-governance across all Ministries and Departments of the government. By 2001, Web-based ICT continued to bloom and strongly influence the information ecosystem. In the year 2006, the National e-Governance Plan (NeGP) was initiated to automate essential routine tasks. It also provided secure online access to services of the Ministry of Corporate Affairs to stakeholders in an expedient manner. Program E-Kranti was conceptualized to provide electronic delivery of services to citizens. World Wide Web (WWW) brought a revolutionary change in information communication and dissemination. ICT made significant development over the years which made it essential for the government to view ICT as a strategic asset. It has the potential to help policymakers restructure and assimilate services to foster relationships with stakeholders and attain major policy objectives (Andersen, Belardo, and Dawes, 1994). Using Extensible mark-up language, or XML, it is possible to convert the display format of information without modifying its connotation (Gil-Garcia *et al.*, 2007). The growing availability of web tools like blogs, social media sites, and virtual platforms offer sources of information exchange and create a dialogue among the public on common issues (Dawes, 2008). The fusion of information technology into government workplaces has changed the work culture, skill requirements of the new workforce, work processes, job design, and organizational structure. It also requires new strategies and leadership behaviours (Perry and Kraemer, 1993).

E-Governance: Conceptual Definition

E-governance is about using ICT by government agencies to carry out government operations, engage citizens, and provide government services. E-governance uses ICT to accelerate the relationship between government, citizens, and businesses by disseminating information and engaging citizens in decision-making (Malik, 2014). State governments have initiated various programs to use information technology as a tool to provide services to people. Digitally connected India can boost socio-economic development by providing easy and reliable access to services like education, health, and finance. However, ICT alone cannot make a difference unless it is used as a tool for the development of other support systems such as education, health, basic infrastructure, overall business environment, innovation, and entrepreneurship. E-governance plays a crucial role in the global economy. International organizations like the United Nations and the World Bank are encouraging the use of e-governance (Kumar, 2017). ICT empowers citizens by providing them access to information, superior service delivery, improved communications with business and industry, and overall efficiency in the management of government affairs (Fraga, 2002). The interaction

between the government and citizens could relate to obtaining and disseminating information and making payments for services (Sharma and Gupta, 2003; Sharma 2006). The resulting benefits come in the form of reduced fraud and corruption, enhanced transparency and convenience to citizens, growth in government revenue along reductions in operating costs (Sharma, 2004). Governmental bodies associate with private firms and nongovernmental organizations (NGOs) for enhancing governance (Palvia and Sharma, 2007). E-governance deals with a gamut of relationships and networks within the government regarding the application of ICT in performing various government activities and enhancing governance (Sheridan and Riley, 2006). It is a procedural approach to the incorporation of standard procedures within the confines of public administration (Bedi, Singh, and Srivastava, 2001; Okot-Uma, 2000). It focuses on providing citizens with transparent, and equitable service delivery, improving the quality of service, and enhancing citizen participation in the governance process (Sharma, 2017). E-governance has changed the way citizens and government relate to each other. It involves realizing the infinite potential of ICT in serving the citizens through electronic means like e-mail, websites, and others (Prabhu, 2015).

India is emerging as a global hub of technological revolution. E-governance is becoming momentous in India. Countries that are top-ranked in e-governance are prosperous (Khan, 2016). Therefore, the economy should be accelerated with the use of technology in all three sectors of the economy; agriculture, industrial, and service sectors. E-governance is getting its importance daily in economic spheres over the years. The Indian economy has been progressive, along with good governance (Nagaraja, 2016). E-governance has eased and bridged the gap between government and citizens. World Bank describes five interconnected objectives of e-governance. They include revisions in policy framework, improvements in public services, efficiency and cost-effectiveness in operations of government; involvement of citizens in the democratic process, and institutional reforms (Dawes, 2008).

E-Governance: Benefits

E-governance has enhanced transparency and accountability in the functioning of government and improved public administration using various tools of e-governance. The government has expanded its reach of governance to the common people through its governance initiatives. E-governance has created an enabling environment for the promotion of economic development. ICT-enabled e-governance has created an enabling environment and benefitted the people. The use of ICT has improved and scaled up efficiency internally within the government system. It has also eased government functioning in providing various services to people. It has avoided duplication, reduced transaction costs in government operations for service delivery, simplified bureaucratic procedures, achieved better efficiency, it has promoted greater coordination and communication between the different stakeholders, has also promoted and enhanced transparency in the government system, it has promoted information sharing between agencies, and security of information management. E-governance has also improvised and created an efficient system externally connecting the different stakeholders. ICT-enabled governance contributes to the faster service delivery of government services, it has increased flexibility of service use, it has brought innovation in service delivery, and it has promoted greater participation of people in the decision-making and eventually empowerment of the people.

The idea of Digital Government was embraced by the National Science Foundation, with the objective of using ICT to sustain and provide government services and engage citizens in a democratic setup. The digital India initiative is to transform India into a knowledge economy. Though digital India faces many challenges, its proper implementation can provide online services to people to shape the knowledge economy (Midha, 2016). The digital India mission has eased people's lives and ensured the availability of government services for common people. It has benefitted people to access various information and services in their village Panchayat office. This has promoted inclusiveness in terms of access to government services. People can get better access to various services such as education, health, information related to agriculture, weather-related information, etc. E-governance has helped in the reduction of corruption in service delivery. Online portals for various services like old-age pensions, student scholarships, e-tenders, and access to various other online services have reduced cases of corruption. It has promoted transparency in the government system such that chances of corruption have automatically reduced. Digital locker systems have provided storage of documents in electronic format like

PAN cards, passports, driving licenses, mark sheets, etc. To help quick transactions in business and services, there are provisions for cashless transactions and the adoption of online payment systems. This is a revolution as people are adopting online payment systems. Even small vendors like vegetable sellers, fruit sellers, Kirana stores, and small retailers have started using an online payment system. ICT and e-governance have supported the growth of e-transactions among the people and facilitated and accelerated economic growth and development in India. Digital India has the potential to boost the GDP of India by up to $1 trillion by 2025 (Sharma, 2016).

Functions of E-Governance

E-governance is a dominant tool to provide public service to the citizens. Some of its functions are discussed in the present section.

1. **De bureaucratization:** Due to e-governance, the dependence of citizens on the bureaucracy for availing government services is significantly narrowing.
2. **E-Services:** It facilitates provision of government-to-citizens (G2C), government-to-business (G2B), and government-to-employees (G2E) services etc. using the Internet.
3. **International Services:** E-governance helps in providing all the essential government services to citizens living outside their country.
4. **Enhances expression of citizen's views:** It provides a mechanism for citizens to express their views on any bill, act, or decision of the government in the form of a grievance portal.
5. **Economic Development:** Information on basic government procedures like import-export processes, series of compliances by companies, opportunities for investment, etc., are available through the Internet. This results in saving time and increases economic dynamism.
6. **Reduce inequality:** E-governance tools empower citizens by providing them with relevant information about government services at marginal cost, time, and effort.

Digital India Initiative

Keeping in mind India's population size and diversity in terms of geographical area and cultures, it is necessary to use ICT to bring about a change in government processes and policies from a manual system to a computerized system. Launched on 1st July 2015, Digital India is an initiative to make available government services to citizens of the country in electronic mode by improving online infrastructure and internet connectivity. The Digital India initiative is a system that can facilitate quick and efficient communication with the citizens of the country and provide better services to them. It aims to transform India into a digitally empowered society and knowledge economy by transforming manual systems into electronic systems. 'Digital India' is a flagship initiative of the government of India to connect swiftly and efficiently with the citizens and provide them with electronic delivery of government services (Singh, 2016). Digital India can help improve the socio-economic situation of the citizens through the development of economic activities along with education, health, and financial services (Sharma, 2016). Digital India is crucial in significant transformation in the agriculture sector and entrepreneurship development in rural sector. Digital India also empowers women in rural areas (Gupta and Arora, 2015). Digital India has provided various services to people, such as Wi-Fi, connectivity to a telephone, digital inclusion, high-speed internet, digital locker, e-education and e-health, national scholarship system (Mohanta, 2017). ICT has opened several job prospects for the youth and provided a boost to the economy. Digital India is a pioneering approach in the direction of providing access to government services online for the masses. It is instrumental in the digital empowerment of the citizens in the country (Paramasivan and Thangaraj, 2018). The Digital India program aims at making a transition towards a digitally empowered economy. Its success is based on three vision areas:

1. **Digital Infrastructure availability:** The basic prerequisite for the success of e-governance is digital infrastructure. It includes the availability of high-speed internet connection, digital identity, a mobile phone that supports digital transactions, a bank account, accessible service centers, safe and secure cyber-space, and cyber laws, especially in rural areas.
2. **Availability of Governance services online**: Services of government departments and jurisdictions need to be made available online as well as on mobile platforms. This is necessary for ease of doing business, making financial transactions electronically, and heading towards a cashless economy. Slowly and gradually, the country is progressing towards a governance

system wherein the need to use documents and certificates in physical form will be limited.

3. **Digitally empowered citizens:** Digital literacy is a prerequisite for being able to make use of digital infrastructure and governance services (Holmes, 2002).

Pillars of Digital India: Some popular E-governance initiatives

The Digital India program is based on nine pillars that require support from across multiple Ministries and Departments. Its main pillars are:

1. **Broadband Highways: '**Broadband for All' is about providing optical fiber networks across the country. Its implementation requires coordination between the Department of Telecommunication (DoT) and village panchayats across the country. National Information Infrastructure (NII) integrates the network and cloud infrastructure to facilitate the provision of high-speed connectivity and cloud platforms.
2. **Mobile Connectivity:** Mobile coverage is being provided to villages and remote locations across the country in a systematic manner.
3. **Public Internet Access Programme:** There are two access programs; one is Common Service Centres (CSCs) and the second is Post Offices as multi-service centers. CSCs are multi-functional service delivery points of government and business services at the Gram Panchayat level. This scheme is implemented with the support of The Department of Posts.
4. **Reforming Government Processes:** Re-engineering of Government processes makes use of ICT to deliver government services more efficiently and effectively across various government Ministries and Departments.
5. **Electronic delivery of services:** To simplify the distribution of public services and enhance good governance, transparency, and service orientation, integration of the back-end processing systems for integrated service delivery, essential ICT infrastructure such as internet connectivity, cloud, and mobile platforms have been provided to departments as required. Its implementation is a collaborative effort of National Information Infrastructure (NII) and DeitY. Cloud technologies are being increasingly used while designing service delivery applications. Government Departments are required to communicate through the Government cloud only. For communicating via a private cloud, permission from the Department of Electronics and Information Technology is required. Such permission is given only after an assessment of the security and privacy aspects. Mobile applications are modified from time to time to enable the delivery of services through mobile. For fast-track approval of any MMPs, empowered committees may be formed to take implementation decisions on a fast track. Information relating to e-governance services must be available in Indian languages as well besides English. All institutions are required to adhere to prescribed security measures for cyber security as prescribed by The National Cyber Security Policy. A platform; MyGov. was launched in the year 2014, for citizen engagement in governance and as a medium to exchange suggestions between citizens and the Government. It facilitates two-way communication.
6. **Electronic Manufacturing:** The focus is on promoting domestic production of electronic equipment and its spare parts with the aim of maximum import substitution over time. It requires coordinated and planned initiatives on multiple fronts like the provision of incentives in taxation, economies of mass production, and reducing cost disadvantages.
7. **National Policy on Electronics:** The National Policy on Electronics initiated in 2012 is a holistic, investor-friendly, and market-driven policy that aims at creating a conducive environment for global as well as domestic investors. From time to time, electronic manufacturing clusters and electronic products are notified. To encourage producers to engage in the manufacturing of electronic products, incentives may be given in the form of tax subsidies or preference in Government procurement.
8. **IT for Jobs:** It focuses on imparting skills and training to the youth from smaller towns and villages so as to make them capable of availing opportunities for employment in the Information Technology sector.

9. **Early Harvest Programmes:** These projects are to be implemented in an early timeline. Various initiatives under this scheme are providing an information technology platform for communication. Some developments include e-greetings across government departments, biometric attendance, availability of Wi-Fi network in office, standardized email design for government communication, use of e-books in schools and colleges; SMS for weather updates, disaster alerts, a portal for information about lost and found children at National level.

Challenges Before the Digital India Program

There are different issues related to e-governance in its execution and implementation such as economic, technical, and social issues. The challenges before Digital India programs are as follows:

1. **Language dominance:** In India, a vast majority of the population does not speak and understand English. People communicate in regional languages or Hindi. The dominance of the English language on the internet restricts the usage by the non-English speaking population. Due to English being the dominant medium of communication over these channels, their usefulness is limited in Indian villages. There are a total of 121 languages and 270 mother tongues of which 22 languages are part of the Eighth Schedule to the Constitution of India. The diversity of the Indian language poses a barrier to developing e-content and services in the local language. These barriers are being removed through the development of e-content in local languages.
2. **Illiteracy:** The technical as well as financial literacy levels are generally low in developing countries like India. A study conducted by the National Centre for Financial Education in their study found that only 27% of Indians are financially literate (Agarwal, 2015). There is a long way to achieve financial literacy in India. It is one of the big challenges on the road to e-governance and digital India.
3. **Inequality and Digital Divide:** There is inequality in the availability of government services across various sections of citizens, especially between urban and rural communities, between the educated and illiterate, and between the rich and poor. The digital divide denies access to digital education, work, and participation in modern life. The digital divide requires attention and redressal. The digital divide is an uneven distribution of resources between urban and rural India. The digital divide causes economic inequality among the people (Warschauer, 2003).
4. **Cyber Security:** Safety and security are a big concern for every individual and government in the operation of e-governance. Cyber security is one of the most important concerns in the online transaction of business and financial transactions. Therefore, protection of information systems (hardware, software, and associated infrastructure), computer devices, mobile devices, and networks from malicious cyber-attacks. The banking sector, e-commerce, and government websites are prone to cyber-attacks. Therefore, strong cyber policy and acts are the need of hours which can protect from cyber-attacks and hacking and at the same time provides a smooth and people-friendly e-governance ecosystem.
5. **Lack of infrastructure:** Infrastructure is another challenge before e-governance in India. Providing high-speed internet in all Gram Panchayat requires physical infrastructure. Availability of electricity, optical fibre networks, computers, smartphones, etc. are some of the basic requirements needed to avail of e-governance services. It requires government expenditure as well as private sector participation for the creation of infrastructure, especially in rural areas. Lack of basic ICT infrastructure, power supply, internet connectivity, medium of technology, and communication is likely to delay the implementation.
6. **Re-structuring of the processes:** Implementation of e-governance requires major restructuring and redefining of administrative processes which is usually resisted by employees in almost all departments at all levels.
7. **Skill development among people:** Lack of skills and poor knowledge among people is another matter of concern in the implementation and execution of e-governance. People's participation is equally important for making any

program successful. Hence awareness should be created and skill training should be imparted related to information technology as well as financial literacy among the people in both rural as well urban areas.

Conclusion

A digital India has the potential to explore different sectors of the economy. During the COVID-19 pandemic e-governance was used at its full capacity to serve the people at their doorsteps. Innovations like e-Sanjeevani-National Telemedicine Service enabled online service delivery of medicines. Aapada Sampoorti Portal enabled fast disbursement of compensation due to disaster-affected families. Pravasi Shramik and Rojgar Setu Portal helped in providing employment opportunities to migrant labourers in their own state. Arogya Setu was a mobile application designed to provide essential health services to the people of India. E-office helped in the smooth functioning of government offices during the pandemic. E-governance is a revolution in the delivery of government services to people that has resulted in the Indian economy gradually transforming into a digital economy. Prior to the launch of e-governance, the dissemination of information and services to people was slower. But it has been eased now due to the ICT revolution. Central and State governments have devised programs and policies to execute and implement e-governance. Although the government is pushing hard for better and more efficient utilization of government services with technology, success is below expectations due to the digital divide and lack of awareness and financial cost. There is a need to revamp the physical infrastructure and provide short-term training programs at every Panchayat to make people aware and learn to avail the government services at the common resource center. Certain hurdles in the execution and implementation of e-governance such as poverty, access to information and lack of awareness among people, lack of financial resources to buy different gazettes and devices to avail e-services, financial illiteracy among people to do e-transaction, security issues, and cost of implementation require attention. Access to data and lower cost of devices especially smartphones are needed for the hours. If people can afford low-cost smart devices, then it will bring a digital revolution at the rural level which will transform the entire e-governance ecosystem. Quality and local language content are other challenges, if the content is available in the local language then people will be comfortable to understand and use it.

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