

Challenges and Opportunities in IT Transformation of Public Service Delivery: Case of India Post

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Abstract

Purpose: Legacy organizations, particularly government departments, have always remained focused on technology acquisition at a low cost. However, they must balance their quest for better financial performance with a commitment to social obligations and inclusiveness. This study analyses the issues faced by a public sector department, India Post, in its digitization process.

Design/methodology/approach: The study takes a case-based approach to analyze India Post's digitization journey through the theoretical prism of the TOE framework.

Findings: The organization's ability to benefit from innovative technology is constrained by its outdated structure and business processes. The other constraints include the limited technological know-how within the organization and the lack of intricate organizational process knowledge of today's vendors.

Practical implications: The study portends important implications for policymakers and provides a base for several inquiries for future research.

Keywords: Digital transformation, Technology organization, Technology adoption

Paper type: Research paper

1. Introduction

The quality of government service delivery to the rural population remains relatively poor in developing countries, including India. Government departments and organizations have taken recourse to technology and digitalization to address this issue. Digitalization is an instrument for social change (Upadhyay et al., 2022; Hilbert, 2020) and provides a vast quantity of data that redefines decision-making across organizational activities, operations, and strategies (Troisi & Grimaldi, 2022). In India, despite rapid urbanization progress, most of the population still lives in rural and semi-urban areas. The delivery of government services to this vast population is challenged by the sparse distribution of resources (Aderamo & Magaji, 2010), the lack of low-cost collaboration tools (Venkatesh *et al.*, 2014), as well as difficulties in overseeing rural public employees (Deiningner & Mpuga, 2005; Dieleman *et al.*, 2013).

E-government and m-government policies have facilitated efficiency among public servants, with citizens developing trust in the government (Abdulkareem & Ramli, 2022; Alomari, 2022; Jaradat *et al.*, 2018; Lin *et al.*, 2017). However, constraints like inadequate IT infrastructure, outdated organizational

practices, and lack of skilled resources have hindered last-mile delivery of e-government initiatives in rural areas (Choudrie *et al.*, 2005; Dwivedi *et al.*, 2012; Dwivedi & Weerakkody, 2007; Gorla, 2008; Weerakkody *et al.*, 2009).

Thus, it is crucial to understand the appropriate processes of digital transformation in large government organizations with a rural focus. This study presents the digitization journey using a mixed approach by analyzing the inhibitors and enablers from the perspective of India Post, the most expansive postal network in the world. Existing literature highlights numerous factors other than technology for successful digitization in the Indian context (Sharma *et al.*, 2020). In this study, we address the following research question: What are the challenges in implementing digitization by government departments in improving public service delivery with a rural focus?

We conducted an in-depth case study to analyze the benefits and challenges of technology adoption in India Post, which plays a pivotal role in last-mile connectivity in rural areas. Of the 156,600 post offices in the country, 90.04% are rural-based. Besides its core mail and parcel delivery activity, India Post provides a diverse range of retail services like money remittances, insurance, banking, and disbursement of social benefit payments (India Post Annual Report 2019–20). Today, under threat from private competitors and reduced government patronage, it is attempting to use technology to improve efficiency and introduce newer services. Our analysis reveals several factors that inhibit technology adoption and value creation within India Post. These findings can help devise strategies and products to deliver several public services effectively. We understand this is a first-of-its-kind study analyzing the underlying nuances of digitalization of a large public sector organization with extensive rural outreach.

The study is structured as follows. Section 2 covers the theoretical context, specifically the IT adoption model required for interpreting our findings. Section 3 describes the research methodology encompassing both data collection and analysis. Section 4 discusses the case study and its findings. The conclusion highlights the limitations and suggests directions for further research.

2. Theoretical Background

The emergence of information technology coupled with mobile technology usage and internet access in rural areas offers an opportunity to enhance government service deliveries (Aker & Mbiti, 2010; Carter *et al.*, 2022; Hooda *et al.*, 2022; Kim *et al.*, 2019; Mukti *et al.*, 2021; Sharma *et al.*, 2021; Upadhyay *et al.*, 2022). The increased focus in public policymaking on digitization and digitalization is an added facilitator. India nurtures a “Digital Dream” of a digitally connected society that enables seamless access and

information resources to create a competitive, innovative, and knowledge-based society. Towards this, the National Digital Communications Policy (NDCP-2018) attempts to integrate the efforts of different agents across businesses, government, and the community at large.

However, an urban-rural “digital divide” is a reality worldwide in this digitized era. The digital divide refers to the inequalities in access to, use, or the impact of the internet and ICT between the digital haves and have-nots across distinct groups based on social, geographical, or geopolitical factors. Such inequalities between rural and urban areas manifest in the rural-urban digital divide. The literature indicates, among others, the following fundamental reasons behind this divide. Owing to low population density, the provision of broadband service in rural areas becomes a high-cost and low-incentive business affair for service providers compared to urban areas (Grubestic, 2010; Glass & Stefanova, 2012). That often leads to limited broadband coverage in rural areas. Besides, government policy measures promoting ICT usage in rural areas often do not produce the expected outcome (Holt & Galligan, 2013; Nucciarelli *et al.*, 2010) as they are not attuned to their different socioeconomic contexts (Birch & Cumbers, 2010).

Given such realities, government service organizations must rework business processes and make other alignments to suit the technological requirements of service delivery using the digital medium to reap maximum benefits (Lin *et al.*, 2017). It necessitates building on the varied aspects of technology adoption within the organization and examining its internal resources and capabilities to remain relevant to its external environment.

Further, customers of government services (or citizens) expect better service delivery than its competitors, which provide similar benefits but with greater efficiency (Kumar *et al.*, 2021) and better customer experience, usually at a higher price. Hence, the success of digital transformation initiatives will depend on their ability to navigate the existing organizational compulsions and the dynamic challenges of the evolving socio-technical external environment.

In this background, the authors believe that the Technology Organisation and Environment (TOE) framework is appropriate to study the outcome of the digitization process of India Post. The framework enables to capture the interfaces of internal organization, external environmental uncertainties, and technological developments in one go.

The TOE framework (Tornatzky & Fleischer, 1990) combines the firm’s internal and external factors and the technological factors that may influence the adoption of technological innovation. The consideration of these factors has made this framework invaluable over other models in value creation

from innovation use, appropriation, and development (Neumann, et. al. 2022; Oliveira *et al.*, 2011; Ramdani *et al.*, 2009; Zhu *et al.*, 2003).

2.1 Organizational Readiness

Organizational readiness is defined by Iacovou *et al.* (1995) as “the availability of the needed organizational resources for adoption”. Service organizations rely heavily on technology consultants for knowledge and experience due to lack of in-house technical expertise (Doom *et al.*, 2010) and external support factors. Besides, the availability of financial resources (Drew, 2003; Mole *et al.*, 2004; Riemenschneider *et al.*, 2003; Thong & Yap, 1995), technological feasibility is also a significant driver of technology adoption (Nelson & Shaw, 2003; Upadhyay *et.al.* 2022).

2.2 Environmental Factors

Extant literature points out that the external pressure faced by any organization can be attributed to competitive pressure, supplier pressure, and customer pressure (Chong *et al.*, 2009; Kula & Tatoglu, 2003; Kumar *et.al.*, 2021). Competitor pressure drives firms to emulate competitor behavior (Gibbs & Kraemer, 2004). Customer pressure is considered a key driver of innovation for product and service delivery (Carmichael *et al.*, 2000; Kula & Tatoglu, 2003).

2.3 Technological Aspect

Over the past decade, governments particularly in developing economies have focused on providing public services through the online platform, “Platform Governance or E-Government”. The success of technology should be measured through simplicity in its adoption and providing value. Thus, the techno-social acceptability of any new “Technology” proves its actual value. Extant research has been done in the technology adoption field to understand the aspects of adoption by users (Davis, 1989). Additionally, through increased digitization, governments strive to reduce their operation cost while ensuring improved transparency, accountability of functions, and an integrated view of citizens across all government services (Tavana *et al.*, 2013; Upadhyay *et.al.* 2022).

3. Research Methodology

In this study, a mixed approach was adopted. The authors, through field visits, have studied the efficacy of technology implementation in India Post’s rural branches. Semi-structured interviews were conducted with the customers of India Post as well as other stakeholders. The study involves an in-depth analysis of

a single holistic case. Scholars have argued for the use of case study-based research to (a) address how and why questions and (b) focus on the contemporary phenomenon (Yin, 2014, Eisenhardt, 1989). Case studies are also recommended when there is limited theoretical understanding to conduct a confirmatory and deductive analysis (Eisenhardt & Graebner, 2007)

3.1 Data Collection

We collected primary data using two different methods. Using a semi-structured interview protocol, we interviewed 35 Branch Postmasters (BPMs) across the states of Uttar Pradesh, Haryana, and Rajasthan. Each of these interviews lasted about 30–45 minutes. Moreover, we interviewed three middle-level managers, heads of districts in these states with predominantly rural branches, and one highest-level officer, former Secretary cum Director General India Post. We also interviewed 12 top-level officials, including Post Master Generals and technology leaders representing the Centre for Excellence in Postal Technologies of India Post. Two more focused group interactions (comprising 5–7 villagers) were conducted to study the advantages and challenges of using post offices for investment and banking products. We collected data from rural post offices of the three states within a 100 km radius of India's National Capital Region (NCR) between December 2020 and July 2022. As the rural services provided by India Post remain uniform across the length and breadth of the country, factors surrounding technology adoption in regions close to the NCR region can be taken as a reasonable approximation of those prevailing in the rest of rural India.

3.2 Data Analysis

The interviews conducted in regional languages were translated into English and the transcribed data were analyzed in two phases. The qualitative data analysis software ATLAS.ti 8.3 was used for the thematic analysis of the interviews. It facilitates structured coding and allows us to study relationships within our data in a systematic way (Barry, 1998; Mukhopadhyay *et al.*, 2019). The transcripts were reviewed multiple times to assign first-level codes, which were grouped under a higher-level theme and then into three aggregate dimensions to arrive at a hierarchical coding structure. We used the technique detailed by Gioia *et al.* (2013) for recursive thematic data analysis, which allows inductive theory building from qualitative data. The resultant data structure (Figure 1) can be termed the core framework of our research findings.

4. Case Study: India Post

With 156,600 post offices (as of March 2022), India Post is the most expansive postal network in the world. India Post's IT modernization project was approved in November 2012, but its implementation in rural branches has been a recent development. The broad objectives of this transformation process are provided here.

- (a) Leveraging the digital network of all post offices to support e-commerce, e-governance, and financial inclusion. India Post wants to be a significant player in the retail financial services industry by introducing online and mobile banking and mobile payment apps;
- (b) Developing infrastructure to extend the reach of the e-commerce industry to tier-2 and tier-3 towns and rural areas;
- (c) Providing a bouquet of citizen-centric services such as the enrolment of citizens in the government's identity database (Aadhaar);
- (d) Evaluation of newer disruptive technologies such as artificial intelligence (AI), internet of things (IoT), and cloud computing for citizen-centric services;
- (e) Achieving financial sustainability by lowering operational costs and earning additional revenue without compromising on the social inclusion objective.

There has been mixed success in this technology adoption exercise. India Post maintains its dominant position in mail and parcel delivery but has not expanded its retail financial services business. Although India Post launched its mobile payment app amidst a surge in demand for digital payment services in India (Upadhyay *et.al.*, 2022), the app has not achieved the requisite end-user adoption.

Central to the case is India Post's RICT (rural information and communication technology) through rolling out handheld devices at the rural branches and supporting technology infrastructure in its regional and central offices. This computerization drive has been rolled out in nearly 130,000 rural units. These devices work with battery or electricity and use mobile connectivity to digitally execute activities such as (a) booking and delivery of mail and parcels; (b) money remittance; (c) opening of bank accounts and deposits; (d) selling of insurance and other financial products. Transaction details are made available instantly on the servers of India Post after its completion. Customers can also use the web or mobile app to check the status of their transactions.

However, our finding reveals that the devices face mobile connectivity issues in many places. Also, Rural branches do not receive adequate technical support. Moreover, the machines are 2G compliant, whereas India has migrated to 4G and is currently rolling out 5G services. Further, the process for

handling any failed transaction is also not adequately defined, leading to friction between employees and customers. Delays in servicing and maintenance of the devices also often lead to the disruption of services.

4.1 Thematic Analysis and Discussion

A thematic analysis based on the interviews done during data collection is presented in Figure 1.

Figure 1: Data analysis and evolution of the constructs

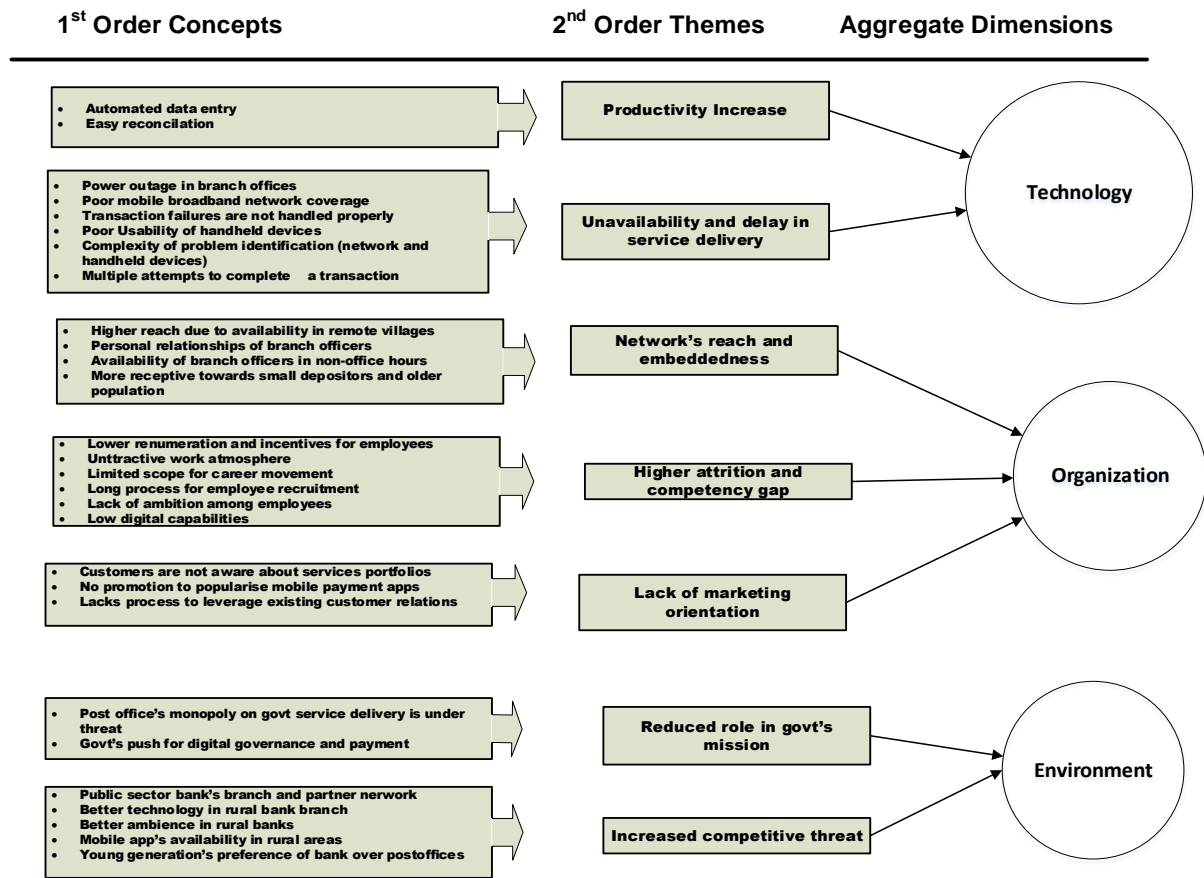


Figure 1 shows first-order codes, second-order theoretical sub-categories, and third-order aggregate theoretical dimensions. The three aggregate dimensions bring out the following three categories of themes in line with the TOE framework.

4.1.1 Technology. The infrastructural technology acquired for rural post offices was supposed to automate and streamline day-to-day work at branch offices and later be augmented by more advanced and innovative technologies. Power outages, inadequate mobile network coverage, and problems with handheld devices hindered the automation process. One rural branch office could not do any transactions for a long time, and the technology vendor support was lacking. The branch's postmaster commented, "All work in our branch has stopped. Many customers have moved to the nearby SBI branch. Despite numerous complaints, the handheld device still does not work in our locality". In another interview, one of the top-level officers commented, "we are struggling with connectivity. From the experience of the Department of Post, one can say that however much we wish that our entire nation be seamlessly connected digitally, the reality is quite different". Another top-level official highlighted a possible lacuna in vendor contracting by India Post, which did not internalize prospects of enabling the latest technology, and said, "the rural area hardware contract was drafted in 2012 when we had 2G and 3G coming up, whereas 4G was never in the purview. When 4G was introduced, many of the service providers started upgrading to 4G, and in many places, this meant that 3G was no more available. When that happened, we were hit".

Besides, inherent transaction complexities got reflected in technologies being developed, requiring multiple data sources and interfaces with other systems (Novak & Eppinger, 2001). The persistence of such issues can complicate knowledge transfers as the interactions tend to explode across data sources, modules, and other systems, thereby contributing to knowledge exchange hazards and inefficiencies and ultimately affecting the outcome of the digitalization process.

4.1.2 Organization. The analysis highlighted different strengths of the institution. Post offices are accessible from any remote location and rural people trust post offices. One customer explained, "BPM is always available, and we can even reach him over the phone. As we are from the same village, there is a personal touch. Though banks have better facilities, they do not like entertaining poor people". However, India Post needs to work on resourcing and employee engagement policies to make the best of technology. Newer generations view jobs in the postal department as lowly paid with minimal career progression prospects. Concerning the job, a young BPM commented, "The salary is not attractive enough. I would leave the job immediately if I had an alternative". Also, India Post needs to leverage existing customer relationships and aggressively market its services. A random customer at a regional post office in Behror, Rajasthan commented, "if a customer lands up at the counter at 13:58 hours to book an urgent courier, then that customer is likely to go unserved as lunchtime starts at 14:00 hours. It is not the case with private

courier services. Besides, post offices need to compete effectively in providing better amenities for customers and service quality. Further, banks and financial institutions make efforts to understand the customer profile and cross-sell their financial products, but this does not happen at India Post”.

Centralized decision-making sometimes acts as an inhibitor to seamless service delivery. While discussing the servicing, repair, and replacement of the handheld devices in the rural post office, a senior superintendent of a region commented that “Whenever post offices inform us about such problems, we try to sort it out the very day. But if we can’t resolve the problem, we seek the advice of the CEPT (Centre for Excellence in Postal Technologies). It gets sorted in two or three days, but replacement is a slow process. We conduct due diligence for the requirement of new devices. That is procured centrally. I do not have the authority to buy a new device”.

India Post could not harness the full potential of technology adoption at the organizational level due to the lack of experience, appropriate skill sets for large-scale IT project implementation, and insufficient vendor knowledge about specific processes. In one of the interviews, a technology leader commented, “We did not have the experience for the implementation of such a large-scale project. I think we were also not very clear about what we wanted. The vendors were also learning with us, but the post office was never on their list of priorities”.

4.1.3 Environment. The changing financial ecosystem and reduced patronage by the government have negatively impacted India Post’s ability to benefit from technology. Banks and digital payment providers have better technology infrastructure. Multiple government schemes provided exclusively by the post office earlier are now available through numerous other channels. One of the postal department employees says, “Options with the public have increased. Several platform-based businesses like mobile wallets and banks have replaced services offered by the post office. Earlier it was mandatory to open accounts in India Post for students getting stipends from the government in India Post, but that is gone now”.

4.2 Theoretical and Policy Implications

The long-drawn digitization process at India Post has been very challenging for both the officials and the government. When this is observed through the lens of the TOE framework, certain specificities emerge about the nuances that add to the existing knowledge base.

With no similar studies in the context of large government departments like India Post, this study tries to identify the accelerators and inhibitors of technology adoption and value creation in such enterprises.

The study highlighted the following: (a) infrastructural deficiencies; (b) inefficient technical devices; (c) limited support from technology vendors; (d) inefficiencies in extant technologies to synchronize complex transactions across multiple interfaces; (e) hazards of knowledge exchange and transfer.

From the perspective of organizational challenges, it highlights the (a) weakness in resourcing and employee engagement policy to make the best of technology; (b) negative perceptions of postal jobs among the new generation; (c) higher attrition rates and competency gap; (d) lack of technological aid to nurture and leverage existing customer relationships to sell more services.

From the environmental perspective, there are challenges of (a) reduced government patronage, (b) rising competition, and (iii) mounting technological gap with competitors.

Despite these challenges, the study highlights India Post's trust in rural India and its personalized customer relationship.

Amid the absence of adequate expertise within India Post, most technology-specific activities are outsourced to vendors on a contractual basis. Besides, multiple actions in the same process flows are being supported by different vendors, necessitating an additional need for effective coordination for the desired outcome. Without sufficient in-house technical expertise, such arrangements risk breeding several disincentives that could foster inferior results.

Most vendor contracts are broadly designed in terms of lump sum payments in exchange for the completion of required services. So vendors are unlikely to bear the risks of any cost escalation. However, clients (India Post) have a lesser incentive to incur coordination costs, resulting in inferior quality service (Kalnins & Mayer, 2004).

Also, a lesson can be learned from experiences in the UK for expanding the broadband framework. Two different models were used (Gerli & Whalley, 2021): community-led initiatives and the public-private partnership (PPP) model. The community-led initiatives were found to be more effective in expanding broadband in a locality, which, however, lacked scalability. The PPP model did not give the expected result, as private partners could not be engaged enough to address broadband supply issues because of a lack of sufficient incentives. India Post attempted to apply the community-led model in a modified structure by engaging private people as BPM first to expand the reach of postal services to rural areas, followed by gradual incorporation of ICT usage in such services. However, India Post could not fully exploit the benefit since it did not allow flexibility in local-level decision-making in terms of choice of telecom network or quick updation or replacement of devices.

Legacy organizations like India Post possess specific knowledge and practices developed over time. The persistence of such knowledge specificities increases the cost of knowledge transfers to vendors (Choudhury & Sampler, 1997; Dibbern *et al.*, 2005). Such client-specific knowledge “can be highly tacit, ‘sticky,’ and deeply embedded in the idiosyncratic internal practices of the client firm” (Tiwana & Bush, 2007). Moreover, owing to the limited scope of replicability of this client-specific customization elsewhere, vendors may be less interested in investing in such customizations.

The necessity of specific institutional aspects has been underscored in the literature on organizational behavior that facilitates successful digitalization. The presence or absence of specific institutional aspects in different forms and, to various extents, may impede that process within India Post. For example, the leading role of managers has been emphasized in either fostering or inhibiting digitalization, which crucially depends on how carefully it gets planned and implemented (Ashaye & Irani, 2019). Individual interactions with the branch postmasters brought out possible lacunae in transmitting the vision of digitalization imperatives and their implementation.

Further, rich literature underscores the need for interagency information sharing to solve critical problems that are otherwise difficult to address with the existing capacities of a single organization. It can be particularly relevant for India Post with specificities and predispositions. Barriers to trust and risk-taking emanating from professional identities and organizational culture can act as inhibitors or even prohibit information and knowledge sharing across organizations (Dawes *et al.*, 2009).

The numerous challenges highlighted by the study have several policy ramifications. The above discussion signifies the need for policies that facilitate capacity building in such organizations to effectively manage technology vendors that enable two-way knowledge transfers for desired outcomes besides ensuring timely vendor support.

The study also highlights the need for policies to onboard resources with new skill sets and comprehensive change management initiatives at the specific organizational level. This will facilitate existing employees across functions to imbibe the digital culture envisaged by the management and highlight their technology-enabled services in every interface with existing and potential customers.

5. Conclusion, Limitations, and Scope for Future Work

Our analysis shows that India Post retained its central position in rural service delivery for a long time. Its digitalization initiatives resulted in automating several manual activities performed by its customer-facing employees. Yet, India Post could extract only limited benefits from these initiatives.

There were also limitations to the technologies acquired – these were transactional compared to the innovative technologies adopted by competitors, also, such technologies had limited efficiency owing to the lack of integrated design involving networks, devices, and applications. Also, most technology-specific activities are outsourced to organizations on a contractual basis. Here, vendor management and knowledge transfers, especially in the presence of knowledge specificities, tacit knowledge, and inherent transaction complexities, are some of the issues that could be relevant and need to be researched further.

Moreover, the existing business processes of India Post do not seem to be reconfigured to leverage digital technologies. The steps taken to ensure that current employees are comfortable with digital technologies were inadequate. Its rigid recruitment process did not allow onboarding of resources with new skills. Its customers were not apprised of technology-enabled service delivery and the availability of a broader services portfolio. The study highlights prospects for research inquiry into the efficacy of conveying the vision of digitalization so that it gets imbibed across India Post and the importance of interagency sharing of skills and information to solve critical problems.

Our study has a few limitations, some of which can be turned into research opportunities. It is based on a single organization, that of a government department in a specific country. Scholars can focus on research designs using multiple case studies. A comparative analysis focusing on flourishing and less effective technology adoption scenarios in government organizations can provide essential insights. The study can be further expanded by focusing on issues of vendor management of government organizations across different levels of digital maturity towards developing specific insights for the digital transformation of large government organizations. A large-scale survey focusing on the managers of such organizations can provide interesting results. Instead of the TOE framework, an alternative theoretical prism, such as organizational culture and e-government maturity models, can be explored to analyse this case.

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