

Digital Transformation in Public Services: Challenges and Opportunities

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ABSTRACT

Objective: This study aims to analyze the critical dimensions of Digital Transformation in the public sector, focusing on its role in enhancing service delivery and aligning administrative functions with 21st-century technological advancements and citizen expectations. **Method:** Employing a qualitative research design, the study utilizes situational analysis tools including SWOT analysis, PEST analysis, and Porter's Five Forces Model. It also incorporates comparative case studies from multiple countries to examine readiness, implementation strategies, and contextual factors influencing digital adoption. **Results:** The findings reveal that while Digital Transformation fosters operational efficiency, citizen-centric services, and strategic planning capabilities, it simultaneously introduces multidimensional risks such as cybersecurity threats, institutional resistance, and regulatory gaps. The analysis also highlights varying levels of preparedness across national contexts, suggesting the need for tailored integration strategies. **Novelty:** The study contributes to existing literature by synthesizing strategic frameworks and empirical cases into a unified roadmap for public sector digitalization, emphasizing not only technological adoption but also governance, risk mitigation, and stakeholder alignment as critical success factors for sustainable digital transformation.

INTRODUCTION

Digital Transformation refers to the use of digital technology in administrative and government services to improve the efficiency, transparency and coverage of public services. This process covers organizational restructuring, developing personnel skills, and creating service systems that are equally accessible to the public [1]. Examples of concepts that related to the transition to digitalization in the public sector include the use of E-Government to manage information and services through online channels, the use of data as a basis for policy and decision-making, and Smart Public Services, which integrate IoT and AI technologies to enhance management efficiency [2]. Thanachart Numnon states that Boston Consulting Group (BCG) outlines the elements of digitalization and recommends that organizations focus on four key elements: 1) Determining and planning business strategies driven by digital technology, which should be aligned with corporate business strategies [3]. This includes recognizing digital trends that will impact operations, such as understanding how the analysis and use of products and services will drive change. 2) Organizational transformation to make digital the core involves operating with digital systems to strengthen the organization [4]. For example, developing Customer Relationship Management (CRM) systems or Enterprise Resource Planning (ERP) systems. At the same time, it is essential to incorporate digital systems to improve operations and create better customer experience. 3) Identifying products and services that can grow digitally, as well as new business models with new

products or services resulting from innovations in digital technology. This may sometimes impact existing business investments, as these investments may require the creation of new business units (e.g., growth hackers) or collaboration with partners within the organization's ecosystem. 4) The driving factors, which are sub-components that will help push the transition to digital technology, include personnel and the organization, data and technology analysis, and the ecosystem, among others [5].

It can be said that digitalization is crucial for the operation of organizations in the modern era that must be supported by all sectors of the organization. Digitalization is not just about introducing technology to modernize operational processes; it focuses more on aligning operations with the digital economy era. The economy in this era differs from the previous one in many ways. Digital transformation should be part of the digital strategy, which should align with changes in the organization's performance and business model. If an organization lacks a digital strategy that aligns with current trends, its future survival may be at risk [5].

Digital Transformation in the public sector has become a crucial approach that helps enhance public services, serving as an important strategy for the development and improvement of management processes in the public sector [6]. To align with technological advancements and the complex needs of people in the 21st century, governments worldwide are committed to developing digital infrastructure and increasing their service delivery potential [7], [8]. However, the application of technology in the public sector focuses not only on efficiency and convenience but also on considering factors related to risks and impacts in various dimensions. This article aims to analyze the key dimensions of digital transformation in the public sector, assess challenges and opportunities, and present academic strategies for sustainable development.

RESEARCH METHOD

This study is qualitative research aimed at examining the readiness, opportunities, and challenges of Digital Transformation in the public sector. The conceptual framework is developed from situational analysis, including PEST analysis and the Five Forces Model, to propose approaches for implementing Digital Transformation in public sector organizations and public services. The data was collected from secondary sources and analyzed using content analysis.

RESULTS AND DISCUSSION

Results

The researcher examined four case studies of Digital Transformation implementation in the public sector to expand the understanding of various aspects that emerged from these examples. The four case studies are as follows:

E-Governance, Estonia

E-Governance in Estonia is widely recognized for its progress in electronic government, with up to 99% of government E-Service offerings today. The significant development of E-Governance and the digital transformation of information in Estonia stemmed from the need to address corruption and reduce public service costs. After gaining independence from the Soviet Union in 1991, Estonia faced challenges such as corruption and a lack of resources. However, one of Estonia's key strengths is the Cybernetics Research Institute, which houses numerous technology experts and has collaborated with the government to establish a strategic plan to promote the development of information and communication technology (ICT). This initiative leveraged digital technology to enhance national potential and competitiveness, while also reforming the government administration system to be more efficient and transparent. Additionally, laws and regulations were adjusted to align with the development of digitalization, and cooperation with financial institutions enabled the expansion of digital services [1], [9], [10].

Aadhaar, India

India has implemented a digital identity verification system known as Aadhaar since 2009 to streamline the registration process for individuals. The Aadhaar initiative facilitates access to essential services for rural populations who may lack official documentation. These services include opening bank accounts, seeking state assistance, and obtaining healthcare. The Aadhaar system has also enabled the government to reduce operational costs and address issues of financial fraud effectively.

Amazon Handmade

A prominent online sales platform like Amazon has supported the craftsmanship of local artisans by providing a marketplace for small entrepreneurs worldwide. Customers can access approximately 3.1 billion Amazon products per month. According to Jungle Scout's 2022 State of the Seller report, 33% of handmade sellers achieve a profit margin exceeding 20% Amazon Handmade offers affordability, as it does not charge a listing fee. Instead, there is a 15% commission per sale, which is transparently reflected in the inventory management dashboard. Additionally, there is no subscription fee for Amazon Handmade, distinguishing it from Seller Central, which charges a subscription fee of 40\$ per month.

Digital Divide, Brasil

Across Latin America, digital inequality is not merely a technological issue but also a reflection of income inequality, with Brazil being no exception. Access to the internet—an essential gateway to education, employment opportunities, and critical services—remains unevenly distributed. To address the digital divide, the public and private sectors have collaborated on targeted local solutions. The initial strategies of the Digital Divide project include the following:

Improving connectivity in underserved areas: This involves promoting Fiber to the Home (FTTH), a technology that leverages fiber optics to deliver fast and reliable high-speed internet directly to households.

Making internet packages and devices more affordable: Reducing the costs of high-speed internet packages and devices ensures greater accessibility for all individuals, thereby fostering digital inclusion.

Promoting digital literacy: Implementing training and awareness programs equips individuals with the necessary skills to use the internet effectively and efficiently.

The result is that Internet access has increased by more than 50% in rural areas and has helped people in the area access more government services and information. In addition, the World Bank is supporting the state of Sergipe in connecting about 1,000 public buildings through fiber optics. This stimulates private investment to bring Internet access to unconnected households by taking these measures. We can work for more equal Internet access in Brazil and around the world. This will ensure that everyone has access to fast, affordable and reliable connections, which are the cornerstone of development in the digital age [11], [12].

SWOT Analysis

Strengths

S1) Improving Operational Efficiency

The implementation of digital transformation enhances operational efficiency by simplifying processes and increasing operational speed. It also reduces costs associated with transitioning from paper-based to electronic systems, including expenses related to document handling, storage space, and redundant workflows. The use of cloud computing for storing government agency data further lowers server management costs while improving information accessibility. Additionally, technologies like automation and artificial intelligence (AI) expedite processes, minimize human errors, and enhance overall organizational efficiency. For example, automated response systems (chatbots) enable government agencies to address public inquiries instantly, eliminating the need for manual intervention.

S2) Improving the Quality of Service

Digital transformation significantly improves the delivery of government services by prioritizing efficiency and responsiveness to public needs. Digital channels such as mobile applications and websites provide convenient, accessible services that allow citizens to engage with the government from anywhere. e-Government systems reduce the need for physical visits to government offices, alleviating the burden on citizens. Personalization of services through Big Data Analytics and Machine Learning ensures tailored solutions, such as healthcare applications that adapt to a patient's medical history.

S3) Enhancing Government Transparency and Credibility

Digital transformation fosters transparency in government operations, a critical factor in building public trust. Real-time data display enables immediate scrutiny of government activities, such as procurement and budgeting, through Open Data systems that make spending information publicly accessible. Blockchain technology further enhances credibility by preventing fraud in procurement, ensuring transparent vote counting during elections, and safeguarding against document forgery.

S4) Data-Driven Decision Making

Digital transformation facilitates effective data collection and analysis, enabling informed policy and strategic decisions. Big Data tools allow government agencies to process vast datasets to predict potential challenges and devise appropriate responses. Additionally, these tools support crisis management by monitoring situations in real time and enabling swift emergency responses.

Weaknesses

W1) Complexity and Dispersion

Digital transformation often increases complexity and system fragmentation, as governments adopt various new technologies and shift from traditional workflows. This complexity can hinder system integration and impede seamless operations, while dispersed information remains a significant obstacle.

W2) Shortage of Personnel with Digital Skills

A lack of technological expertise among government personnel poses a significant challenge. Skills in programming, data analysis, and advanced digital system management are often insufficient, as traditional human resource development systems have not adapted to the digital era. This skill gap delays project implementation, increases reliance on external experts, and raises costs, ultimately hindering the successful adoption of digital technologies.

W3) Digital Infrastructure Imbalance

In many developing countries, digital infrastructure such as internet networks, cloud storage systems, and data centers is often inadequate and unevenly distributed. This results in a digital divide between urban and rural populations, limiting access to digital services for those in remote areas. Consequently, traditional processes may persist in regions with insufficient infrastructure, reducing service equality and delaying project success.

W4) Budget Constraints and High Costs

According to a McKinsey report (2018), 70% of digital transformation projects in developing countries fail to achieve their goals due to budget constraints. High costs for system development, equipment procurement, and personnel training challenge the implementation of digital transformation in public services. Limited financial resources in some countries exacerbate these issues, reducing the likelihood of project success.

W5) Long-Term Change Management

Digital transformation is an ongoing process requiring flexibility and sustained management. However, many government agencies lack long-term strategic plans, leading to project stagnation and unsustainable development. Projects without robust plans often fail to adapt to technological advancements or policy shifts. Political changes, such as leadership transitions, can further disrupt digital initiatives, as priorities may shift when new governments assume office. For instance, public concerns have arisen about the potential disruption of the digital wallet project following the resignation of a prime minister.

Opportunities

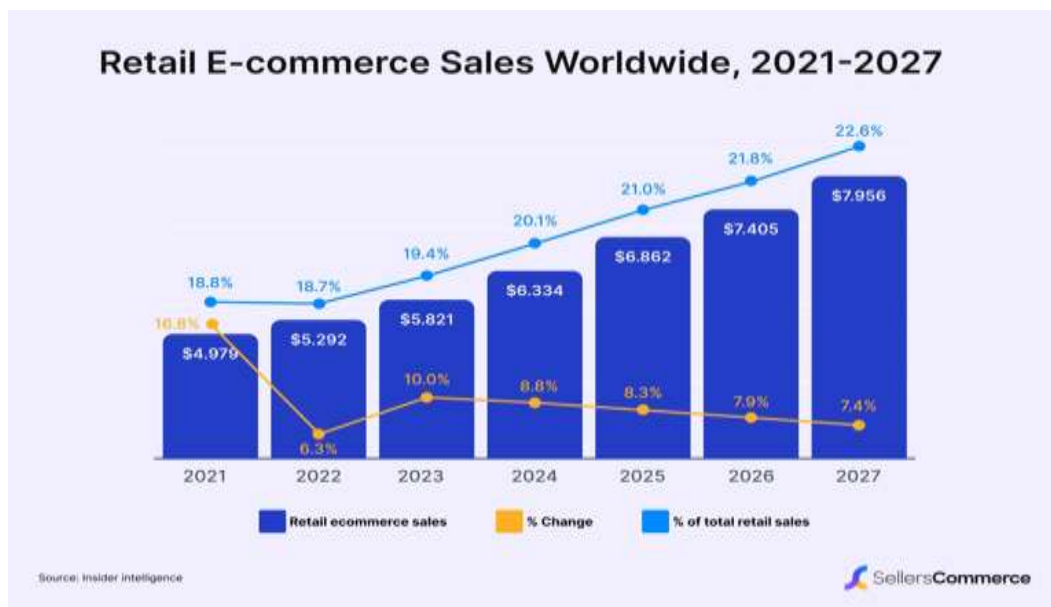
O1) Enhancing the Efficiency of Public Service Operations

The integration of digital technology into government organizations offers significant cost-reduction opportunities, including decreased labor costs due to reduced dependence on manual processes. Digital technologies expedite operations, particularly those involving large-scale data management, while improving resource utilization. Transitioning from paper-based systems to software not only prevents data loss but also enables long-term data storage. Additionally, digital systems facilitate better resource tracking and management, reducing the risk of corruption within organizations. Technology-driven systems enhance transparency by enabling real-time monitoring of government spending and operations, thereby strengthening accountability.

O2) Increasing Access to Services for All Demographics

Digital public services enhance convenience and reduce disparities in service access. The implementation of M-Government (Mobile Government) leverages mobile technologies, such as smartphones, tablets, and applications, to deliver government services. This approach makes accessing government information and services more convenient for individuals and organizations. Services like fee payments, tax filings, and notifications can be provided through user-friendly mobile applications or websites, enabling two-way communication. Citizens can engage with government agencies in real-time to request information, lodge complaints, or provide feedback. The use of intelligent technologies such as artificial intelligence (AI), chatbots, GPS, and automated notification systems further improves service delivery and access to critical information.

O3) Supporting the Local Economy Through Digital Platforms



Source : Insider Intelligence

Digital transformation presents opportunities to promote local economic growth by linking the digital economy with government operations. According to Insider Intelligence, global e-commerce sales are projected to reach \$6.86 trillion in 2025, marking

an 8.37% increase from 2024. This growth is expected to continue at a compound annual growth rate (CAGR) of 7.8% between 2025 and 2027, reaching \$8 trillion by 2027 – more than double the growth rate of physical retail stores. These figures highlight the increasing profitability of e-commerce as a platform for businesses, underscoring its potential to boost local economic activity when supported by digital public policies and platforms.

Therefore, it presents a significant opportunity for the government to support small entrepreneurs in accessing these prospects. This effort should begin with the development of digital infrastructure, such as expanding high-speed internet networks to ensure coverage and accessibility in all areas, particularly to facilitate online business operations for individuals in remote regions. Furthermore, the government can enhance support by promoting the development of cloud platforms tailored for small and medium-sized enterprises (SMEs), enabling them to better manage information and services. Additionally, the government must advocate for the promotion of local products in international markets. By integrating data with Big Data technologies, both the government and local entrepreneurs can gain a deeper understanding of the objectives and behavior of service providers. The adoption of Big Data technologies will also enable the government to devise more precise and efficient strategies for promoting products.

Threat or Challenge

T1) Digital non-artificiality

According to the National Statistics Office of Thailand, it was found that in the fourth quarter of 2023, the Thai population aged 6 years and over was about 66.0 million, with about 62.9 million mobile phone users, accounting for 95.2% of this population. Therefore, the population that does not use mobile phones accounts for about 4.8% of the population aged 6 years and older. There are also areas without internet or telephone signals in Thailand. Clear and current information is still limited. However, it is reported that there are more than 700 schools that do not have telephone signals, internet, or even electricity, which reflects the problems in accessing technology in some areas of the country. In addition, there is a survey that Thailand has Internet users accounting for 85.3% of the total population, which means that about 14.7% of the population has not yet used the Internet.

Although the introduction of Digital Transformation into the use of government agencies and public services is very challenging, both in terms of resisting the change of certain groups of people. The challenge of changing from the original system to using the digital system and other challenges, but the use of Digital Transformation in government agencies has more advantages over disadvantages. In addition to reducing labor costs, it can also monitor government operations. Make the work more transparent. In addition, the introduction of Digital Transformation into use will make the government can make policy decisions. Plan public service strategies accurately and effectively to achieve public satisfaction, which is at the heart of public services.

Table 1.

		Opportunity	Challenge
PEST analysis			
P: Political Factors	Efficiency of public services. In addition to Digital Transformation will increase the efficiency of public services. It also helps reduce waste and add value to the overall economy. For example, public health management with digital platforms can reduce patient care costs and increase the quality of treatment.	Bureaucratic delays and opposition from certain interest groups. Changes in the complex government administration system may cause delays in operations or not in accordance with the original goals. In addition, political instability or government changes may cause relevant policies to lack continuity. which affects the implementation of digital projects in the long term Cyber security. The government faces pressure to develop laws and comprehensive security measures. This is to protect personal information and create confidence for the public.	
E-Economic Factors	Digital Transformation can reduce the cost of government operations. Digital Transformation can significantly reduce the cost of government operations. By using automation, it reduces time and resources for services such as document preparation, data processing and communication between departments. In addition, investing in digital infrastructure also stimulates the broad	Economic inequality and budget restrictions. Economic inequality and budget constraints remain major obstacles, especially in developing countries. A shortage of resources in both capital and skilled personnel may delay project implementation or fail to achieve the set goals. In addition, investing in digital technology often comes with high initial costs such as infrastructure installation, personnel training and equipment	

	Opportunity	Challenge
	economy, especially in the rapidly growing technology industry. Improving the efficiency of public services In addition to Digital Transformation will increase the efficiency of public services. It also helps reduce waste and add value to the overall economy. For example, public health management with digital platforms can reduce patient care costs and increase the quality of treatment	maintenance. These can be a financial burden for the government, especially in situations with budget constraints.
S-Social Factors	People can access public services more conveniently and quickly. The government's introduction of Digital Transformation into the agency will allow people to access public services more conveniently and quickly, such as requesting official documents through the online system. Payment for service fees through digital platforms or accessing public information through government agencies' websites These things reduce complexity and increase transparency in the service process. In addition, digital transformation also reduces the gap between population groups with different levels of access to	Resistance to change from some demographics Resistance to change from some population groups, especially the elderly or those who are not familiar with technology. It is a major obstacle to the introduction of digital services. The government needs to invest in educating and creating understanding about the use of digital services. In addition, concerns about data privacy are still issues that need to be addressed. A small number of people may not trust that their personal information will be used safely.

	Opportunity	Challenge
	public services. The development of services through mobile devices such as smartphones also helps people in rural or remote areas have equal access to public services.	
T- Technological Factors	Able to monitor state performance and make accurate policy decisions. The government's introduction of new technologies such as AI, Blockchain and Internet of Things (IoT) into the agency will have the potential to change public services to be more efficient and transparent. For example, using AI to analyze data allows the government to make accurate policy decisions. Or using Blockchain to create transparency in the procurement system. In addition, Cloud Computing technology also helps reduce restrictions on data storage and increase the ability to expand public services to cover a wide range of people.	Modification from an outdated system to a digital system. The transition from an outdated system to a modern digital system is a challenge that requires time and resources. In addition, cybersecurity risks increase when relying on technology increase. Therefore, the government must develop modern and flexible security measures against potential threats to the public. In addition, the skill gap in personnel working in the government is also a major obstacle. Many personnel still lack knowledge and skills in dealing with advanced technology. Making the implementation of digital projects unable to fully achieve their goals.

From the analysis of Digital Transformation with the above tools, it will show opportunities and challenges. But this transition, the government has to face the problem of diverse external factors. The author has therefore brought Micheal Porter's Five Forces Model to analyze competitive factors, cooperation and in-depth challenges. Details are as follows:

Table 2.

	Opportunity	Challenge
Five Forces Model		
Industry Rivalry	Driving force for innovation. Competition encourages government agencies to develop new technologies such as Single Window Services systems that help reduce operational procedures.	Limited budget and resources. Government agencies often face budget constraints, which makes digital development difficult compared to the private sector.
	Building cooperation between government agencies. The development of a data linkage system between departments reduces duplication, such as the use of the National Data Exchange system that allows various agencies to share information with each other.	Outdated old system (Legacy Systems) Government agencies in many countries still rely on old systems such as offline document storage systems such as paper recording, which makes it difficult to integrate with new technologies. Shortage of specialized personnel. Bringing Digital Transformation into government and public service agencies requires personnel with knowledge of advanced technologies such as AI and Cybersecurity, which are resources that are scarce in many areas.
Bargaining Power of Suppliers	Using Open Source Technology. The government can reduce dependence on major suppliers by supporting the use of Open Source without copyright restrictions, for example, the PostgreSQL database system or the Linux operating system.	Increased cost of technology procurement. Although major suppliers offer advanced technology, high prices and restrictions on the state budget, which can be an obstacle to the procurement and development of technology.
	Development of local suppliers. Promoting domestic technology companies	Technology Transition Challenges. If government agencies want to change system suppliers, there

	Opportunity	Challenge
	reduces dependence on international suppliers and supports the domestic economy. Development of Supply Ecosystem. Government agencies can create multiple partners (Multi-Supplier Partnership) to diversify risks, such as using Cloud services from multiple service providers instead of relying on a single one.	may be problems with data migration (Data Migration) and it takes a long time to train personnel to use the new system, causing delays in changing technology systems.
Bargaining Power of Buyers	Development of services that meet people's needs. Government agencies can develop easy-to-use services such as applications for the elderly or systems that support multiple languages. Promote public participation (Civic Engagement) The state can create a platform that allows people to participate, such as giving suggestions or online voting. Using data to improve the service (Data-Driven Services) Analysis of data from people's use helps the state understand real needs, such as the development of public transport routes based on travel information.	Unequal access to technology. People in rural areas or underprivileged groups may not have access to the Internet or digital devices, making it impossible to use government online services. Data Security Risk (Data Privacy) Concerns about personal information breaches may cause people to hesitate to use government services. The complexity of digital systems. Some poorly designed services may make it difficult for people to use, resulting in dissatisfaction.
Threat of New Entrants	Stimulate innovation in government agencies. Competition from new players encourages government agencies to develop services and adopt new technologies to meet the needs of the people.	Inequality in resources. New players often have better flexibility and innovation, making government agencies that lack resources at a disadvantage in competition.

	Opportunity	Challenge
	Cooperation between the public and private sectors. New players can work with the state in Public-Private Partnerships (PPP) such as digital infrastructure development. New players add options to the public, such as a variety of payment systems or queue booking applications that meet the needs.	Confidence in the state system has decreased. If a new player offers a better alternative, people may stop relying on government services. Issuing regulations that do not keep up with technology. The state may delay in supervising new players, causing legal loopholes and potentially causing problems.
Threat of Substitutes.	Creating pressure for the state to develop. The availability of substitutes will be able to encourage government agencies to improve their services and develop new technologies to meet the needs of the people. Cooperation opportunities with the private sector. The state can cooperate with alternative product developers to improve services and make the public service use more convenient.	Reducing the role of the state. If private substitutes are more popular than government services, it may cause people to stop relying on the state. Inequality in access. Substitute products may not cover all groups, such as people in rural areas may not have access to technology.

The author of the article has studied from sample countries that have been implemented and successfully implemented Digital Transformation, and qualitative analysis has shown important opportunities for implementing Digital Transformation. At the same time, it reveals various challenges as well. The positive aspect of this analysis process is that the use of digital platforms increases efficiency and access, reducing the duration of administrative operations and providing opportunities for people in remote areas to access necessary services. It also helps strengthen public participation. Through two-way communication on mobile applications and social media, which helps promote transparency and responsibility. With increased public satisfaction, the challenge, the government may take some time to change the traditional work system to the use of digital system. And there is also a chance of resistance within the organization. Including external factors that are difficult to control, technological inequality that some people still have not access mobile phones and are far from internet signals and some people are still worried about cybersecurity.

Discussion

This article employs qualitative analysis to develop a conceptual framework derived from Situational Analysis, incorporating SWOT Analysis, PEST Analysis, and the Five Forces Model, to provide an overview of the transition to digitalization in the public sector. It assesses factors influencing both opportunities and challenges, highlighting that Digital Transformation is a critical process for advancing and improving public service delivery in the public sector. The adoption of digital technologies in operations enhances efficiency, facilitates performance monitoring, promotes transparency, and improves access to public services. This transformation encompasses organizational restructuring, skill development among personnel, and the utilization of data to inform policy decisions (Data-Driven Governance), employing concepts such as E-Government, Smart Public Services, and the integration of IoT and AI technologies to enhance management effectiveness [13], [14], [15], [16], [17].

Making the Five Forces Model shows that there is an opportunity to send public participation to use feedback to improve services and encourage new innovations. But there are still challenges in terms of pressure from people who want the government to have a standard of service that is equal to the private sector. And the introduction of digital technology into government agencies and public services also have budget restrictions and technological inconsistency. In addition, in some areas, there are still problems with people who do not have phones and cannot access to the Internet services.

Case studies of countries that have successfully implemented Digital Transformation in their public sectors provide valuable insights. However, challenges remain, particularly in securing adequate budgets to restructure organizations and integrate new technologies effectively.

CONCLUSION

Fundamental Finding : This study concludes that Digital Transformation significantly improves the efficiency, transparency, and responsiveness of public sector services by leveraging technologies such as AI, IoT, and Big Data, as demonstrated through PEST and SWOT analyses. **Implication :** The successful implementation of digital systems has the potential to modernize public administration, reduce operational costs, and foster citizen trust through improved accessibility and decision-making processes. **Limitation :** However, this research is limited by its qualitative nature and reliance on secondary data, which may not capture the full spectrum of institutional and cultural barriers, particularly in under-resourced or developing regions. **Future Research :** Further empirical investigation is recommended to explore cross-national comparative models of digital governance, including quantitative assessments of impact, stakeholder engagement, and the role of digital literacy in bridging the digital divide for inclusive public service transformation.

REFERENCES

- [1] L. E. Chigova and C. Hofisi, "Positioning Digital Transformation of Public Sector Human Resources in Zimbabwe and South Africa: Challenges and Opportunities," in *Digital Transformation in Public Sector Human Resource Management*, IGI Global, 2024, pp. 251–270. doi: 10.4018/979-8-3693-2889-7.ch013.
- [2] M. Kayyali, "Digital Transformation in Public Sector Management: An Overview," in *Enhancing Public Sector Accountability and Services Through Digital Innovation*, IGI Global, 2025, pp. 289–324. doi: 10.4018/979-8-3693-9251-5.ch009.
- [3] A. Karnaushenko, "Digital drivers of business model transformation in the circular economy paradigm," in *Economy in the era of digital transformation: trends, opportunities and perspectives*, Scientific Route OÜ, 2025, pp. 27–50. doi: 10.21303/978-9908-9706-0-8.ch2.
- [4] J. Child, "On Organizations in Their Sectors," *Organization Studies*, vol. 9, no. 1, pp. 13–19, Jan. 1988, doi: 10.1177/017084068800900105.
- [5] D. Kumar, "Digital Transformation: Technology and New Business Models as Drivers of Customer Experience," in *Impact of Digital Transformation on the Development of New Business Models and Consumer Experience*, IGI Global, 2022, pp. 57–73. doi: 10.4018/978-1-7998-9179-6.ch004.
- [6] T. K. Hazra and B. Unhelkar, "Strategic Planning for Digital Business," in *Enterprise Architecture for Digital Business*, Auerbach Publications, 2020, pp. 57–72. doi: 10.1201/9781315120409-3.
- [7] J. Jarke, "Co-Creating Digital Public Services," in *Co-creating Digital Public Services for an Ageing Society*, Springer International Publishing, 2020, pp. 15–52. doi: 10.1007/978-3-030-52873-7_3.
- [8] S. L. Naji and L. Goosen, "Effectiveness of Using Education Management Information Systems for Data-Driven Decision Making: Enhancing the General Education Sector in Ethiopia," in *Enhancing Public Sector Accountability and Services Through Digital Innovation*, IGI Global, 2025, pp. 381–408. doi: 10.4018/979-8-3693-9251-5.ch012.
- [9] S. R. Chohan and G. Hu, "Strengthening digital inclusion through e-government: cohesive ICT training programs to intensify digital competency," *Inf Technol Dev*, vol. 28, no. 1, pp. 16–38, Nov. 2020, doi: 10.1080/02681102.2020.1841713.
- [10] M. E. Milakovich, "The Transition from Electronic Government to Smart Digital Governance," in *Digital Governance*, Routledge, 2021, pp. 26–54. doi: 10.4324/9781003215875-2.
- [11] S. Makouei and Z. D. Koozekanani, "Design of pseudo-symmetric high bit rate, bend insensitive optical fiber applicable for high speed FTTH," *Opt Commun*, vol. 332, pp. 379–383, Dec. 2014, doi: 10.1016/j.optcom.2014.07.015.
- [12] S. K. Brown, *Voters Want Affordable High-Speed Internet Access for All New Yorkers: Infographic*. 2020. doi: 10.26419/res.00416.003.
- [13] A. Lima and J. Pacheco, "New Trends and Tools for Customer Relationship: Challenges in Digital Transformation," in *Educational and Social Dimensions of Digital Transformation in Organizations*, IGI Global, 2019, pp. 1–26. doi: 10.4018/978-1-5225-6261-0.ch001.
- [14] A. Soni and I. Treasaden, "Qualitative study: learning from recovery: what do people who have recovered from alcohol dependence have to teach those who are still struggling?," *BJPsych Open*, vol. 7, no. S1, pp. S292–S292, Jun. 2021, doi: 10.1192/bjo.2021.775.

- [15] G. Schwarz, "Comparative economic organization of support services: shared services versus government agencies," in *Public Shared Service Centers*, Springer Fachmedien Wiesbaden, 2014, pp. 107–137. doi: 10.1007/978-3-8349-4480-1_4.
- [16] D. Valle-Cruz and R. García-Contreras, "Towards AI-driven transformation and smart data management: Emerging technological change in the public sector value chain," *Public Policy Adm*, vol. 40, no. 2, pp. 254–275, Jul. 2023, doi: 10.1177/09520767231188401.
- [17] P. Elimian, C. Kiyak, and D. Cetinkaya, "Adoption of Digital Health Technologies in Supported Living Services," in *Proceedings of the 10th International Conference on Information and Communication Technologies for Ageing Well and e-Health*, SCITEPRESS - Science and Technology Publications, 2024, pp. 181–189. doi: 10.5220/0012631300003699.

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