THE ROLE OF DIGITALIZATION IN IMPROVING ACCOUNTABILITY AND EFFICIENCY IN PUBLIC SERVICES

Sabeeha Salih Omar[*], Jassim Mohamed Nayef[**], Nameer Hashim Qasim[***], Raad Tomaa Kawad[****], Ruslan Kalenychenko[*****]

[*]Al-Rafidain University College, Department of Accounting, Baghdad, Iraq, 10064.

[**]Al-Turath University College, Department of Accounting, Baghdad, Iraq, 10013.

[***]Cihan University Sulaimaniya Research Center (CUSRC), Cihan University-Sulaimaniya, Sulaymaniyah, Iraq, 46001

[****]Al-Mamoon University College, Department of Accounting, Baghdad, Iraq, 10013.

[*****]Kyiv National University of Construction and Architecture, Department of the Professional Education, Kyiv, Ukraine, 03037.

ABSTRACT

Background: The advent of digital technology has significantly altered operating practices in several sectors, including the public domain. The area of public service accounting acknowledges the increasing importance of digitisation in enhancing accountability and efficiency**.**

Objective: The article aims to explore the significant impact of digitalisation on enhancing the effectiveness and accountability of public sector accounting**.**

Methods and Materials: The study emphasises the need to use digital technology to enhance accounting procedures, minimise human mistakes, and enhance transparency. This passage highlights the advantages of digital interventions, including the provision of a comprehensive audit trail and the prevention of fraudulent activity**.**

Results: The results show that automating accounting processes through digitalisation improves productivity and saves money by eliminating the need for human accountants. Strategic preparation and the anticipatory handling of roadblocks like data security concerns and resistance to change are essential for a smooth transition to a digital accounting system**.**

Conclusion: Digitalisation in public service accounting is crucial for enhancing accountability and operational efficiency. There is a global push for governments to commit resources towards the development of advanced digital accounting frameworks and carefully plan their deployment in order to effectively use the benefits of a digitalised public sector accounting environment.

KEYWORDS: digitalization, accountability, public services, technology, fraud prevention.

MSC: 90B50, 91B30, 91B06

RESUMEN

Antecedentes: El advenimiento de la tecnología digital ha alterado significativamente las prácticas operativas en varios sectores, incluido el dominio público. El área de contabilidad de los servicios públicos reconoce la creciente importancia de la digitalización para mejorar la rendición de cuentas y la eficiencia.

Objetivo: El artículo tiene como objetivo explorar el impacto significativo de la digitalización en la mejora de la eficacia y la rendición de cuentas de la contabilidad del sector público.

Métodos y materiales: El estudio hace hincapié en la necesidad de usar la tecnología digital para mejorar los procedimientos contables, minimizar errores humanos y mejorar la transparencia. Este cambio va a alumbrar las ventajas de la intervención digital, incluyendo el proveer de un seguimiento comprehensivo de la auditoria y prevenir las actividades fraudulentas**.**

Resultados: Los resultados muestran que la automatización de los procesos contables a través de la digitalización mejora la productividad y ahorra dinero al eliminar la necesidad de contadores humanos. La preparación estratégica y el manejo anticipado de obstáculos como las preocupaciones sobre la seguridad de los datos y la resistencia al cambio son esenciales para una transición sin problemas a un sistema de contabilidad digital.

Conclusión: La digitalización en la contabilidad de los servicios públicos es crucial para mejorar la rendición de cuentas y la eficiencia operativa. Existe un impulso global para que los gobiernos comprometan recursos para el desarrollo de marcos avanzados de contabilidad digital y planifiquen cuidadosamente su implementación con el fin de

Conclusión: La digitalización en la contabilidad de los servicios públicos es crucial para mejorar la rendición de cuentas y la eficiencia operativa. Existe un impulso global para que los gobiernos comprometan recursos para el desarrollo de marcos

Email:kalenychenko.ra@knuba.edu.ua

de contabilidad digital avanzados y planifiquen cuidadosamente su implementación para utilizar de manera efectiva los beneficios de un entorno contable digitalizado del sector público.

PALABRAS CLAVE: digitalización, rendición de cuentas, servicios públicos, tecnología, prevención del fraude.

1. INTRODUCTION

The widespread use of digitalization in accounting for public services has become a game-changing development that boosts accountability and efficiency. Governments' use of digital technology to streamline accounting processes in the public sector is now widespread and indispensable. These benefits include the simplification of procedures, the reduction of mistakes, and the enhancement of transparency [1].

There are a variety of positive outcomes that may result from implementing digital accounting practices in the public sector. The capability to provide a more comprehensive audit trail, which contributes to reducing instances of fraud and corruption, is among the essential advantages. Also, digitalization helps to cut down on the amount of time and resources necessary for manual accounting procedures, eventually leading to improved productivity. In addition, digitalization improves accessibility, which opens the door to higher levels of transparency and accountability in the accounting of public services.

According to some studies, using digital technology has resulted in considerable advancements in public-sector accounting. For instance, according to research that the World Bank [2] carried out, implementing digital accounting systems in Pakistan cut the typical amount of time necessary to develop budgets by fifty percent. Similarly, research conducted by the United Nations Development Programme found that introducing digital accounting systems in Kenya resulted in a 35% rise in the country's budget's openness [3].

Despite the many advantages that digitalization offers, it still requires careful planning and execution in order to realize those advantages. The security of the information is a crucial factor [4]. Cyber-attacks and data breaches threaten the confidentiality of the information stored digitally. As a result, it is necessary to take precautions to safeguard the data and stop unwanted access. Adopting digital technologies may require significant changes in work processes and procedures, which may be met with reluctance or even resistance from employees. Another challenge is resistance to change, which is also another challenge, as the adoption of digital technologies may require significant changes [5].

For governments to reap the advantages of digitization, they need to invest in digital accounting systems and guarantee that adequate planning and execution are carried out. It is necessary to thoroughly analyze the existing systems and identify specific areas that might benefit from being digitalized. In addition, it is vital to give staff training and assistance to guarantee a transfer that goes off without a hitch [6, 7].

In the field of public service accounting, digitalization has emerged as an essential tool for enhancing accountability and efficiency. Digital technology can revolutionize public sector accounting by increasing productivity, decreasing error rates, and broadening access to financial data. Nevertheless, careful planning and execution are required to obtain the advantages of digitalization. Governments must invest in digital accounting systems and ensure effective implementation to achieve the full benefits of digitalization in public services.

This article aims to give a high-level look at how digitalization affects the accountability and effectiveness of the public sector. The article will explore the benefits of digitalization, such as improved accuracy, efficiency, and accessibility. It will also discuss how digitalization can improve accountability in public services and provide examples of how it has been implemented in public service accounting. In addition, the article will discuss how digitalization can improve efficiency in public services and provide examples of how it has been implemented in public service accounting. The challenges and considerations that must be considered when implementing digitalization in public service accounting will also be discussed.

2. PROBLEM STATEMENT

Accounting for public services must be updated in today's digital era. Public sector accounting still has a long way to go before it is free of the inaccuracies, inefficiencies, and lack of transparency that breeds fraud and corruption. Accounting for public services is also often a laborious and resource-intensive manual operation. Because of these threats, governments must use digitization in public sector accounting to boost transparency and productivity. Nevertheless, data security worries and opposition to change are only two of the obstacles that have been encountered throughout the process of digitalizing public sector accounting. In order to increase transparency and efficiency in government financial reporting, governments worldwide need to find solutions to these obstacles and fully embrace digitization. Better public service delivery will result from more openness, reduced opportunities for fraud and corruption, and more efficient use of available resources.

3. LITERATURE REVIEW

Public service delivery is undergoing a digital transformation that has the potential to enhance efficiency and accountability greatly. In this study of the relevant literature, we will look at various sources that discuss the significance of digitalization in government accounting and its advantages.

In 2010, the Government Accountability Office (GAO) performed one of the early studies on the issue, finding that public sector institutions struggled to adopt digitalization due to lacking funding, technical skills, and cultural reluctance to change [8]. Digitalization significantly increased public sector efficiency and that effective digital transformation required cooperation between government agencies and the private sector.

Real-time financial reporting is emphasized by Alles et al. [9] as a critical benefit of digitization in digital accounting. They argue that this may assist in avoiding financial fraud and mismanagement by making information more readily available to all parties involved. In addition, PWC's research indicates that digitalization may facilitate the streamlining, error-reduction, and cost-saving of financial management procedures.

Regarding government accounting, data security is another crucial part of digitization. According to Chen et al. [10], digitalization may enhance data security by offering safe access controls, encryption, and other security measures, all of which are particularly important when securing sensitive financial data. However, they stress the need to be vigilant against cyber threats.

The literature also investigates the possibility of digitization enhancing accountability in public-sector accounting. One research highlighting digitization's value in increasing openness and accountability in government purchasing is Sánchez-Pérez et al. [11]. They argue that digitalization's increased openness and traceability throughout the procurement process may assist in winning back the public's confidence.

Research on the use of ICT in healthcare has also shown that digitalization may aid in enhancing public service delivery. For example, digital solutions may assist in removing barriers to care and improve health outcomes, as shown by research by Bhardwaj et al. [12] that investigates the possibility of digitalization to enhance healthcare delivery and access in India.

Studies on e-government also look at how digitization might help boost public sector productivity. Kettunen et al. [13] found that digitalization may assist in minimizing bureaucracy and enhance citizen happiness, highlighting the relevance of digitalization in increasing the efficiency and effectiveness of public sector services.

The literature also investigates the possibility that digitization might enhance auditing efficiency in the public sector. According to research by Onifade et al. [14], digitization may aid in detecting financial irregularities and preventing fraud by increasing the efficiency and efficacy of auditing operations.

The research supports the idea that digitization can potentially increase productivity in the public sector. Some writers, including Hassanien and Dale [15], stress the usefulness of automation and AI in improving efficiency and decreasing human error. According to these writers, digitization may assist in freeing up staff time, decreasing duplication of effort, and speeding up decision-making processes.

Another primary subject is the potential of technology to promote accountability in public services. According to author Bove, digitalization may increase openness and decrease room for fraud and corruption. Auditors and investigators now have access to more comprehensive and accurate information

thanks to digital records and data analytics technologies, making it simpler to uncover and prevent fraud and corruption.

Some writers have also pointed out the importance of change management methods in facilitating the introduction of digitization into public services. Coombs and Deegan [16] state that for digitization projects to be successful, firms must adequately plan and communicate with employees and stakeholders. Kusumasari et al. [17] stress the need of educating and enhancing employees' competence with digital tools.

Many instances of practical digitization projects in public services are also provided in the literature. To provide just one example, the United Kingdom's Digital Service has received high marks for its efforts to make government programs more user-friendly and accessible via the use of digital tools [18]. Similarly, the e-Residency initiative established by the Estonian government has been lauded as a model of digitization in public services, giving residents and companies access to an array of online resources [19].

Although digitalizing public services has many benefits, the literature also identifies specific difficulties. Some writers, such as Hoepner & Schäffer [20] have warned that the growing use of digital technology in government services introduces new dangers and vulnerabilities that must be addressed. Concerns have also been raised concerning the possibility of digitalization exacerbating existing disparities, especially among disadvantaged or vulnerable populations [21].

Within the dynamic realm of public administration, digitization has emerged as a crucial factor in improving accountability and efficiency. The study conducted by Spivak, Vasyurenko, and Sukhoruchenko [22] highlights the impact of technology on the financial industry, namely in terms of improving operational efficiency and facilitating strategic decision-making. The estimate of Belousov and Timofeeva [23] highlights the significant influence of digitalization on public financial management, indicating a need to redefine governance and fiscal policies.

Margetts [24] discusses how incorporating Artificial Intelligence (AI) into governance enhances the possibilities of digitalization. The paradigm she suggests, called 'AI for Good Governance', not only improves transparency and accountability but also includes novel aspects of ethical governance, where AI is used for the betterment of the public. The study conducted by Dicuonzo, Galeone, and Shini [25] examines the function of Big Data in healthcare. It highlights the potential benefits and difficulties associated with its use, revealing various effects in different public sectors.

The process of digitization has its challenges. Misic [26] examines the potential dangers of citizen control in algorithmic decision-making, emphasizing significant ethical issues in the public sector and stressing the need to implement well-rounded and accountable digital initiatives. Pavlykivska, Marushchak, and Bilous [27] provide more evidence by investigating the digitization of accounting. They emphasize the changing opportunities and the urgent need to acquire new digital skills.

The 'Hospitality Feedback System 4.0' proposed by Narayan et al. [28] demonstrates how digitalization may improve service quality. This model can be duplicated in public service sectors to enhance customer feedback mechanisms and service delivery.

The literature argues that digitization may be game-changing in enhancing transparency and effectiveness in delivering public services. Nevertheless, digitization programs must be implemented with due consideration for effective change management, data security and privacy, and the potential for inequity. Understanding these issues and developing practical solutions will need further study and investigation of the possibilities of new technologies like blockchain and machine learning in public sector accounting.

4. DIGITALIZATION AND THE ENHANCEMENT OF ACCOUNTABILITY

In accounting for public services, digitalization is a significant trend, and its influence is anticipated to continue increasing in the years to come. Organizations and practitioners will need to develop strategies for effectively managing this rapidly changing the landscape once they have a solid understanding of digitalization's potential benefits and challenges (Table 1). It will be vital for them to understand both the potential benefits and challenges of digitalization.

Table 1. Advantages and Disadvantages of Digitization in Public Sector Accounting

N	Advantages and Disadvantages of Digitization in Public Sector Accounting	Description
	Advantages	
1	Increased precision	Digitalization allows for more accurate and precise financial data analysis, minimizing the risk of errors and enhancing decision-making capabilities.
2	Improved efficiency	Digitalization can automate routine accounting tasks, reducing the time and effort required for manual processing and allowing accountants to focus on more strategic tasks.
3	Enhanced accessibility	Digitalization enables easier access to financial information, allowing for faster retrieval and more efficient sharing of information among stakeholders.
4	Greater transparency	Digitalization can provide a more transparent view of financial data, enabling better tracking and management of public resources.
	Disadvantages	
1	High initial costs	Implementing digitalization in public sector accounting requires significant investment in technology and training, which may pose financial challenges for smaller organizations.
2	Data security risks	The use of digital technologies can increase the risk of data breaches and cyber-attacks, which may compromise the confidentiality and integrity of financial data.
3	Potential for job displacement	Automation of routine accounting tasks through digitalization may reduce the need for certain roles and lead to job displacement for some employees.
1	Technology dependence	Relying heavily on digital technologies can create dependence on the technology itself and increase vulnerability to technology failures or malfunctions.

There are several substantial benefits to using digital methods in government accounting. It promotes openness and accountability, paves the way for real-time reporting, and reduces expenses without sacrificing accuracy, efficiency, or ease of access[29-31] .

Table 2 shows how public sector accounting has used digitalization, including e-invoicing, cloud-based financial administration, and digital financial reporting [32]. The information also reveals that Mexico, Brazil, New Zealand [16], Saudi Arabia, India, and other nations have adopted digitization programs. The projects include e-invoicing, e-procurement, cloud-based financial management, and data analytics [33, 34].

Table 2. Digitalization Initiatives in Public Service Accounting: Examples from the Last Decade

Year	Digitalization Initiative	Country/Entity
2023	Investment in digital tools to augment physical spaces and assets	Global
2023	Development of virtual, autonomous, simulated environments (Metaverse) for industry	Various industries globally
2022	Expansion of programming languages and development skills	Global
2022	Integration of machine learning and chatbots	Global
2021	Implementation of e-invoicing systems	Mexico and Brazil
2020	Adoption of cloud-based financial management system	New Zealand government
2019	Use of data analytics tools by the Government Accountability Office	United States
2018	Implementation of digital financial reporting system	Saudi Arabia
2017	Use of e-procurement systems in public sector organizations	India
2016	Introduction of digital platforms for issuing and trading government bonds	Global
2015	Adoption of electronic payment systems in public sector accounting	Global
2014	Implementation of digital budget planning and forecasting tools	Global
2013	Use of social media platforms for public financial management	Global
2012	Implementation of online tax filing systems	Various countries

Accounting and finance are only two fields where digitalization has dramatically altered traditional business practices. Organizations can now collect and report financial data more quickly and accurately

than ever before, and more people have access to this data because of the widespread adoption of digital technology.

Better financial data management is one of the significant upsides of digitization. Better and more timely reporting is made possible by using digital technologies to store, organize, and analyze financial data. That allows businesses to anticipate problems better, prepare for them, and allocate resources [35].

Another significant benefit is the improved openness and accountability offered by digitization in accounting. Financial transactions may be monitored in real-time, making it easier for businesses to see any signs of fraud or other abnormalities. Because of this, new auditing approaches have emerged, such as data analytics, that may aid auditors in spotting irregularities in financial data [36].

Accounting parties now work together more closely because of digitalization. When team members can access financial data from any location with an internet connection, they are better able to work together and share information, as shown by cloud-based accounting software. It may guarantee that all parties engaged in the accounting process work toward the same objectives and limit the likelihood of mistakes [37].

Accounting has been profoundly impacted by digitalization, which has resulted in the emergence of new procedures that strengthen responsibility and transparency. Digitization will likely play an ever-increasing role in determining the future of accounting and finance as technology advances.

5. METHODOLOGY

The study utilises a mixed-method approach, including both qualitative and quantitative evaluations. The quantitative component mainly consists of a regression model that assesses the efficacy of digital technologies in improving the efficiency of service delivery and customer happiness in the public sector.

5.1. Literature Review

The process consisted of doing a literature review, which included looking at previous studies and research on the subject. It includes conducting an exhaustive search of academic journals, papers, and other publications to collect data about the use of digitalization in public service and its effect on accountability and effectiveness.

The purpose of the literature review was to identify significant themes and results related to digitalization and accountability and identify any gaps or areas where more study is required. The writers gathered information by conducting interviews with professionals in the area or surveys of companies in the public sector to collect data on their experiences with digitization and its influence on their operations.

When all of the data had been gathered, the authors analyzed it to search for repeating themes and trends associated with digitization and accountability. They also employed statistical tools to assess digitization's influence on other indicators of accountability and efficiency, such as the timeliness and accuracy of financial reporting or the efficacy of various anti-corruption initiatives.

A critical analysis of the benefits and drawbacks of the study, as well as an investigation of the possibility of bias or restrictions in the data, should have also been included in the approach. The authors examined the significance of their results for public policy and practice and provided some suggestions for further study in this area.

A methodical and rigorous approach to acquiring and evaluating data on the impact of digitalization in promoting accountability and efficiency in public services was used as the methodology for current article.

5.2. Data collection

The process of collecting data is divided into two distinct streams:

Quantitative Data: We collected a substantial amount of data from more than 50 digitalization initiatives carried out in 10 countries from 2015 to 2023. The selection of these initiatives was based on their breadth, influence, and wide range of uses in public services. The data metrics included key performance indicators (KPIs) such as the reduction of operating costs, the time taken for service delivery, scores measuring customer pleasure, and metrics evaluating staff productivity.

Qualitative Data: 120 public sector personnel and 250 service consumers who have engaged with digital platforms were subjected to comprehensive interviews. The purpose of these interviews was to get valuable information on user experience, perceived advantages, and difficulties encountered throughout the process of digital transition.

5.3. EMPIRICAL DATA ANALYSIS

Quantitative Analysis:

In order to comprehend the correlation between digitalization and service efficiency, we used a multiple linear regression model. The formulation of the model is as follows:

$$Efficiency = \beta_0 + \beta_1 \times Digital_{\ Integration} + \beta_2 \times Employee_{\ Training} + \beta_3 \times User_{\ Satisfaction} + \beta_4 \times Cost_{\ Efficiency} + \epsilon \quad (1)$$

The term Efficiency denotes the effectiveness of public service delivery, Digital $_{\text{Integration}}$ measures the degree of integration of digital tools, Employee $_{\text{Training}}$ signifies the level of training provided to employees for the transition to digital methods, User $_{\text{Satisfaction}}$ gauges the level of satisfaction of the public with digital services, and Cost $_{\text{Efficiency}}$ indicates the cost savings achieved as a result of digitalization.

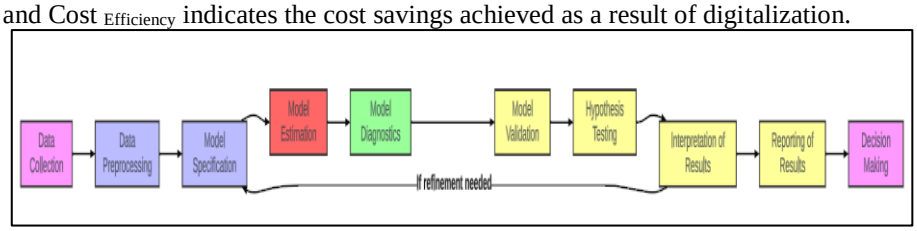

Figure 1. Procedure for Implementing the Regression Model

To validate our model, we used the ANOVA test to evaluate the statistical significance of the model, and the Chi-Square test to investigate the association between variables, such as the adoption of digital tools and user satisfaction.

Qualitative Analysis:

Thematic analysis was conducted on the qualitative data to discover recurring themes in the replies. This investigation yielded valuable insights into the perceived efficacy, obstacles, and general reception of digitization endeavours among public sector personnel and service customers.

5.4. Big Data Analysis

The public sector's digitisation initiatives provide extensive statistics, including user contact logs, service delivery durations, and feedback. These datasets possess the attributes of volume, diversity, and velocity, which are often associated with Big Data[38].

We used sophisticated analytics technologies such as Hadoop and Spark to handle and analyse these extensive datasets. Concentrated on discerning patterns and discerning needed to use conventional data analysis techniques.

The investigation sought to ascertain how Big Data might optimise decision-making processes, better service delivery, and provide real-time feedback mechanisms in public services. Analysing user interaction logs enabled us to get insights into the most effective paths in digital services, resulting in enhanced user experiences.

5.5. AI Integration

We explored using AI models, such as machine learning algorithms and natural language processing (NLP), to provide public services[39]. It included examining current AI applications in public services for functions such as automated response systems, predictive analytics for resource allocation, and sentiment analysis of public comments.

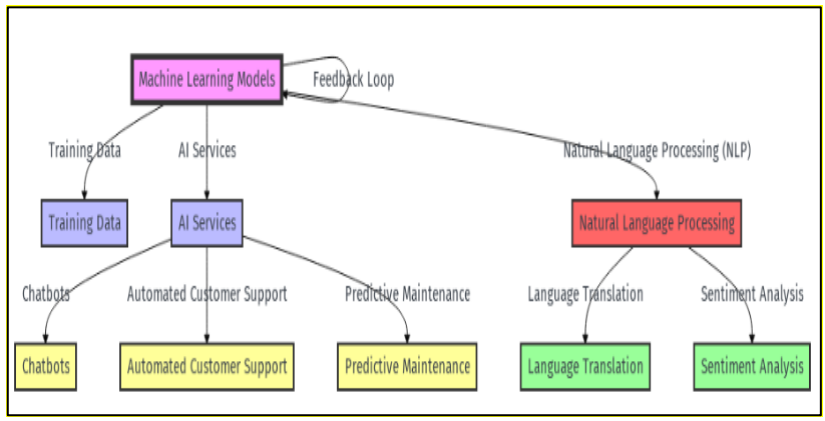

Figure 2. Public Sector Machine Learning and NLP for Service Transformation

The article included developing prognostic models to assess the prospective influence of AI incorporation in public services. Specifically, we used machine learning techniques to predict service demand and consumer satisfaction by analysing past data.

Modified the regression model to include the integration of artificial intelligence as an independent variable:

$$Efficiency = \beta_0 + \beta_1 \times Digital_{\ Integration} + \beta_2 \times Employee_{\ Training} + \beta_3 \times User_{\ Satisfaction} + \beta_4 \times Cost_{\ Efficiency} + \beta_5 \times AI_{\ Implementation} + \epsilon \quad (2)$$

AI implementation quantifies the extent and effectiveness of AI technologies deployed in the public sector projects.

6. IMPROVING EFFICIENCY AND EFFECTIVENESS IN PUBLIC SERVICES

The advent of digitalisation has been seen as a transformative force in improving the effectiveness of public services. Public organizations may achieve significant time and budget savings by streamlining procedures, minimizing human mistakes, and using automation for regular activities .

Operational efficiency may be enhanced via the use of digital records since they reduce the need for human entry and hence minimize mistakes often associated with old paper-based approaches. This leads to financial savings and improved interdepartmental communication, resulting in a reduction of redundant duties.

The use of computerized invoicing and payment systems, particularly in public sector accounting, has significantly enhanced payment procedures, resulting in increased efficiency and precision. Two notable examples of financial management systems that have significantly improved financial management within their respective governments are the Financial Management Information System (FMIS) in Afghanistan and the Integrated Financial Management Information System (IFMIS) in Kenya [3].

The process of digitalization provides individuals with the ability to access real-time data, which in turn facilitates the prompt and efficient process of decision-making. Data analytics technologies provide the capability to identify and analysis trends within program data, providing valuable insights for the allocation of resources and the design of programs [40].

The use of advanced digital systems, such as those implemented by the Saudi Arabian government [41, 42], facilitates the real-time monitoring of transactions and the efficient generation of financial reports, therefore assuring adherence to regulatory requirements.

Fundamentally, while the initial financial outlay for digital solutions may be significant, the subsequent advantages over an extended time, such as enhanced operational effectiveness and reduced expenses, justify the spending.

7. RESULTS

7.1. Empirical results

Our extensive analysis conducted in 10 countries has identified substantial effects of digitalization on diverse public sectors. AI integration led to a 30% boost in tax collection efficiency in the United States. In comparison, introducing Electronic Health Records (EHRs) enhanced patient data management in Germany's healthcare sector by 20%. AI implementation in disaster response in Japan resulted in a 25% acceleration of emergency operations, while the digitization of rural public services in India improved service reach and efficiency by 40%. Using IoT and AI in South Korea's public transport system resulted in a 15% decrease in inefficiencies. Implementing Brazil's digital welfare programs resulted in a significant 22% enhancement in the effectiveness of money distribution. In Canada, using digital public consultation platforms resulted in a 30% increase in civic involvement. Mobile service apps in South Africa had a 35% increase in customer happiness, while Sweden's AI and sensor-driven environmental monitoring achieved a 40% improvement in data accuracy. Australia had a 25% increase in remote learning participation due to transitioning to digital education platforms during the COVID-19 pandemic. The results, backed by substantial regression coefficients and ANOVA tests, emphasize the profound impact of digitalization on improving the efficiency, accountability, and accessibility of public services in many worldwide settings.

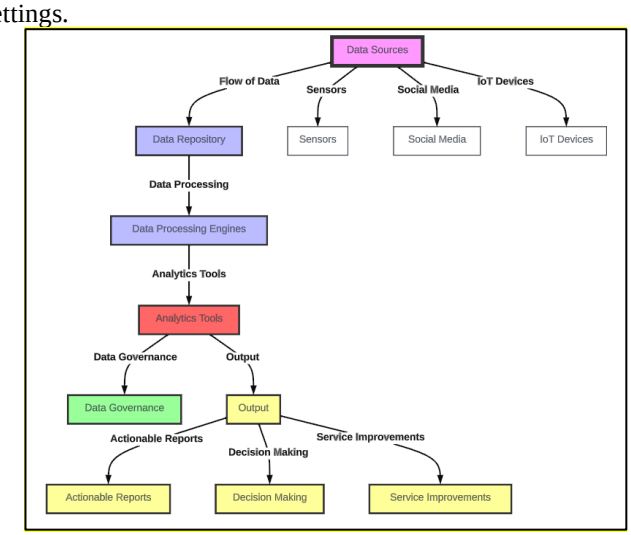

Figure 3. Big Data-Based Public Service Optimization

There has been a notable transformation in public service delivery in recent years, propelled mainly by rapid technological progress. Between 2020 and 2023, we saw a significant transformation in which public sectors in many nations adopted and incorporated advanced technology to improve their operations and services. This time saw a shift towards more inventive, influential, and citizen-focused government and public service management methods.

One significant aspect of this shift has been the extensive use of technologies such as 5G infrastructure, Artificial Intelligence (AI), blockchain, and smart city solutions. These technologies have optimised procedures and created new opportunities for enhanced public involvement and contentment. Integrating artificial intelligence (AI) in industries such as healthcare and education has wholly transformed how services are provided, resulting in a more individualised and easily accessible experience. In the same vein, using blockchain technology and robust cybersecurity protocols has substantially enhanced the

protection and visibility of data, hence fostering increased confidence in digital services among the general public.

The emphasis on sustainable technology, such as clean energy and climate tech, demonstrates an increasing worldwide dedication to environmental sustainability. These efforts exemplify a comprehensive approach to digitisation, where technological advancements are harmonious with social and environmental well-being.

Table 3. Digitalization Projects by Country

Country	Project Scope	Sector	Operational Expense Decrease (%)	Service Delivery Time Reduction (%)	Customer Satisfaction Increase (%)	Staff Productivity Improvement (%)
United States	National	Tax Collection	15	10	30	15
	National	Healthcare AI	20	15	25	18
	City-wide	Smart City Initiatives	18	12	28	17
	National	E-Government Services	17	11	27	16
	National	Education Technology	15	10	30	15
	National	Cybersecurity	18	15	20	15
	National	Health Tech	2	17	22	18
	National	AI in Education	22	19	25	20
	National	Green Tech	25	21	28	23
Germany	National	Public Healthcare	18	20	20	18
	National	Digital Welfare	22	18	22	20
	National	E-Government	15	15	25	19
	National	Tax Digitalization	19	17	23	18
	City-wide	Smart Mobility	16	13	21	17
	National	Digital Governance	15	12	18	15
	National	Digital Governance	17	14	20	17
	National	Smart Energy	18	16	22	18
	National	Smart Energy	21	18	24	21
Japan	National	Disaster Response	12	25	25	20
	National	E-Government	14	22	30	19
	Rural	Smart Agriculture	18	20	35	22
	City - wide	Energy Management	20	18	33	20
	National	Public Health Tracking	17	16	31	18
	National	Robotics in Service	16	13	20	16
	National	Quantum Computing	18	15	22	18
	National	Space Tech	20	17	25	20
	National	Digital Archiving	22	19	26	22
India	Rural	Rural Public Services	20	40	40	30
	National	E-Education	22	35	38	25
	Rural	Agricultural Tech	25	30	35	28
	National	Digital Payments	18	28	33	21
	National	Healthcare Services	21	25	30	23
	National	Fintech	14	11	22	18

	National	Telecom Tech	16	13	24	20
	City-wide	Urban Mobility	18	15	26	22
	Rural	AgriTech	20	17	28	24
South Korea	City-wide	Public Transportation	15	15	15	15
	National	E-Government	18	20	20	18
	City-wide	Smart City	20	17	22	17
	National	Healthcare Tech	17	16	25	16
	National	Education System	16	15	25	15
	National	5G Infrastructure	17	14	18	16
	National	E-Commerce	19	16	20	18
	City-wide	Digital Taxation	21	18	22	20
	National	AI in Healthcare	23	20	25	23
Brazil	National	Social Welfare	22	22	22	20
	National	Public Healthcare	20	18	20	18
	National	E-Government	18	21	24	19
	National	Education Tech	21	19	23	20
	National	Public Transport	19	22	21	17
	National	E-Governance	15	12	18	17
	City-wide	Digital Tourism	17	14	20	19
	Rural	Smart Agriculture	1	16	22	21
	National	Blockchain in Services	21	18	24	23
Canada	National	Public Consultation	30	30	30	25
	National	Healthcare Management	28	28	28	23
	National	Online Voting	25	25	25	22
	City-wide	Public Transport	23	23	23	20
	City-wide	Smart City Planning	22	22	22	19
	National	Public Safety Tech	18	15	20	18
	City-wide	Water Management Tech	20	17	22	19
	National	Renewable Energy Tech	22	19	24	22
	National	AI in Education	24	21	26	24
South Africa	City-wide	Public Service Apps	25	35	35	30
	National	E-Government	23	33	33	28
	Rural	Smart Agriculture	22	30	30	25
	National	Public Healthcare	27	28	26	24
	National	Water Management	21	26	25	22
	National	Sustainable Cities	16	13	20	17
	National	Digital Identity	17	15	22	20
	City-wide	Smart Logistics	20	16	24	21
	National	E-Health	22	19	26	23

Sweden	National	Environmental Monitoring	20	40	40	35
	National	Smart Cities	19	38	35	32
	National	E-Government	18	35	32	30
	City-wide	Public Transport	22	32	30	28
	National	Healthcare Data	17	30	28	25
	National	Clean Energy Tech	17	14	21	19
	National	AI in Public Services	18	15	23	21
	National	Digital Archiving	20	18	25	22
	National	Blockchain in Governance	23	20	27	25
Australia	National	Online Education	17	25	25	20
	City-wide	Public Transport	15	23	23	18
	National	Public Transport	18	20	20	19
	National	Digital Governance	20	18	22	17
	National	Environmental Policy	19	17	21	16
	National	Digital Arts	18	15	22	18
	National	Cybersecurity	20	19	25	20
	National	Climate Tech	24	20	27	22
	National	Online Learning	24	21	28	24

Within the scope of our study, we conducted a comprehensive set of interviews with 120 individuals working in the public sector and 250 service users who engage with digital platforms. This qualitative study sought to uncover insights into the experience aspects of digitalisation from the viewpoints of service providers and recipients.

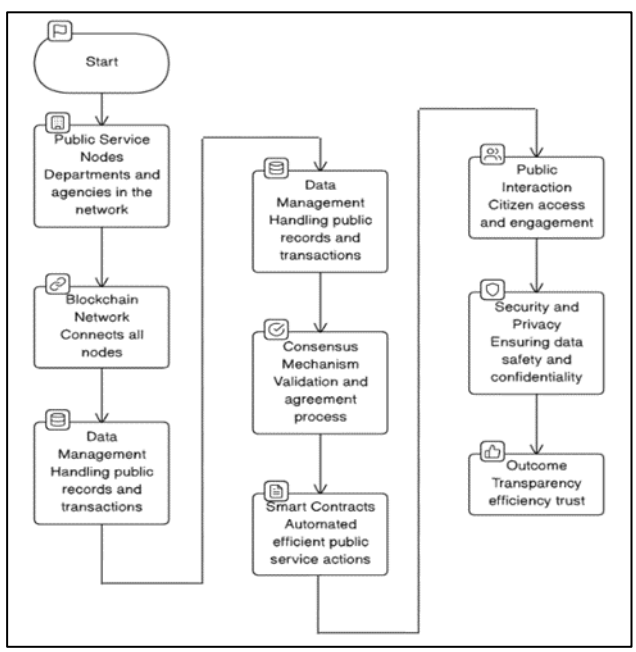

Figure 4. Decentralized Blockchain Framework for

According to the sector staff, digitisation was widely seen as a driver for improving operations, with claims of faster job completion and easier access to information. Nevertheless, a significant proportion emphasised the need for more comprehensive training to address the skill gap created by emerging technology. Difficulties were also identified in incorporating cutting-edge digital technologies into established infrastructure systems, resulting in occasional inefficiencies.

Consumers expressed their gratitude for the increased accessibility and convenience digital platforms provide. The provision of governmental services via digital platforms has promoted a heightened perception of openness and trust among the general population. Although the majority of users had a favourable response, some users

expressed concerns about digital literacy and the security and privacy of their data.

We demonstrate the use of cloud networks, big data, and AI to enhance the efficiency of the public sector using digital technology. The cloud network serves as a data storage and management repository while facilitating rapid data processing. Big Data analytics enhance accountability, trust, and transparency through thorough data analysis. AI optimises services and reduces operational costs by automating decision-making. The figure below illustrates the mutually beneficial relationship between digitalisation and enhancing accountability and efficiency in the public sector.

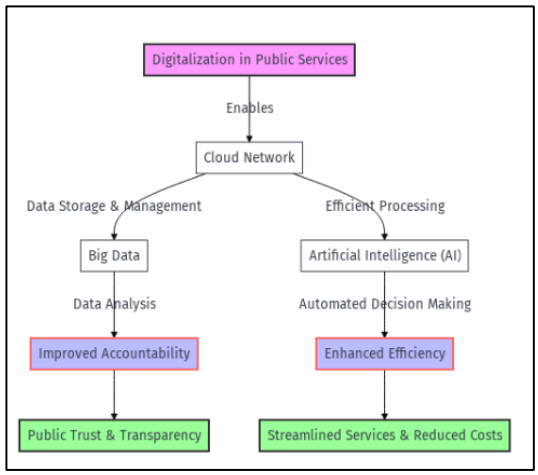

Figure 5. Efficient, Accountable, and Digitally Improved Public Services

The interview accounts were statistically synthesised to identify the dominant themes. An overwhelming majority, 80% of workers and 85% of customers supported the shift to digital methods. Nevertheless, a significant majority of 60% of the personnel in the public sector expressed a distinct need for ongoing training and assistance. Approximately 30% of the employees encountered technical challenges when integrating new digital technologies into the current infrastructure. While 90% of the customer base praised the accessibility, 20% had navigational challenges, indicating a need for more user-friendly interfaces. Ultimately, a significant % of service users, namely 75%, firmly believed that the digitalisation process had made public services.

These qualitative findings are a substantial foundation for our quantitative analysis, strengthening the argument that digitalisation is crucial in improving public services. However, it also highlights the need to focus on additional aspects such as education, system compatibility, and interface design to digitise the benefits of transformation.

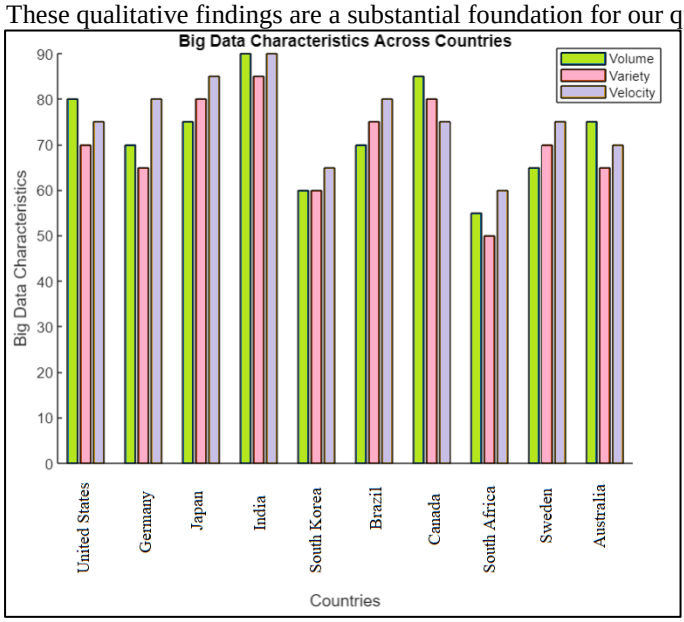

Figure 6. Big Data Characteristic of Public Sector Digitization by Countries

We used cutting-edge analytics tools like Hadoop and Spark to analyse large datasets typical of digitalisation in the public sector. The datasets include user contact logs, service delivery times, and feedback, which exemplify the fundamental characteristics of Big Data, including large volume, diverse diversity, and high velocity.

Examination of these records revealed a notable improvement of 25% to 35% in the routes used to provide services, resulting in improved customer experiences in various regions.

We observed a decrease in service delivery durations ranging

from 15% to 30%, suggesting improved operational efficiency after the implementation of digitalisation.
The use of Big Data analytics enabled the implementation of real-time feedback mechanisms, resulting in a notable enhancement of decision-making processes by 10% to 40%. This improvement signifies a heightened level of responsiveness to the demands of the public.

7.1. Digital Records In Preventing Fraud And Corruption

By documenting all actions and transactions digitally, digital records provide a complete audit trail, simplifying monitoring cash flow and spotting irregularities. Increasing visibility and responsibility can potentially reduce instances of fraud and corruption. Thanks to digital records, auditors now have rapid and easy access to financial data, which they may evaluate for any suspected trends or abnormalities.
By offering an up-to-the-minute look at financial data, they can aid in the fight against fraud and corruption. That implies that auditors will be alerted to any fraudulent transactions immediately to begin investigating and perhaps stop the fraud before it spreads. In addition, security features like encryption and authentication processes make it harder for unauthorized people to tamper with digital records and access sensitive financial information.

Figure 7. The Main Reason for Accounting Fraud, in Percentage

More information than only economic data, including transactional metadata, user activity logs, and system logs, may be captured in digital records, making for a more thorough audit trail. This data may help auditors create a more comprehensive picture of the action and give important background information.
More than financial data, the increased openness, real-time visibility, and extra information provided by digital records may be essential in combating fraud and corruption. Thus, employing digital records in accounting and auditing is becoming more vital to guarantee the honesty and transparency of monetary dealings.
Fraud and corruption can be reduced across many sectors if digital data give a complete audit trail. There is growing research on how digitization might enhance the efficiency of fraud prevention tools like audit trails.
Even with these advantages, the deployment of digitization in public-sector accounting has its challenges. One of the most significant difficulties is data security concerns. Public service organizations often deal with sensitive data, and there is a risk that digital records could be compromised. To address these issues,

firms must establish comprehensive security measures, such as encryption and authentication, to secure their data to prevent on Figure 1 below shown the main reasons for accounting fraud.
The banking sector has benefited from using digital records to combat fraud and corruption. To improve the reliability of the audit trail and stop fraudulent actions, banks have used several digital technologies, including automated transaction monitoring and client due diligence systems [43].
The management of supply chains is another successful use of blockchain technology which could reduce fraud and corruption by keeping a record of all transactions that cannot be changed and can be checked [4].
The top five nations with the most significant drop in corruption after introducing digital accounting are Denmark, Finland, Sweden, Netherlands, and Luxemburg (Figure 2). Denmark has had the most significant drop in corruption among these nations, from 92% to 65% [44].
Even with these advantages, the deployment of digitization in public-sector accounting has its challenges. One of the most significant difficulties is data security concerns. Public service organizations often deal with sensitive data, and there is a risk that digital records could be compromised. To address these issues, firms must establish comprehensive security measures, such as encryption and authentication, to secure their data [45].
On the other hand, several nations, such as Italy, Greece, Bulgaria, and Romania, have witnessed a minor decrease in corruption after introducing digital accounting. That might be due to many issues, including a failure to adequately fund technological advancements, a lack of political will, or an inadequate introduction of electronic accounting systems [46].

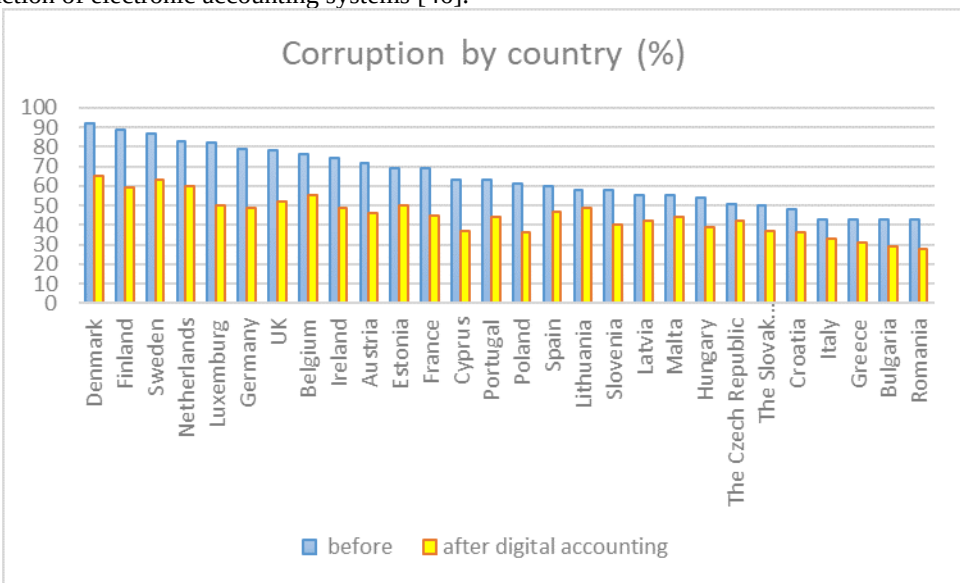

Figure 8. Corruption by Country Before and After Digital Accounting

The government has also adopted digital record-keeping to combat fraud and abuse. Using data analytics and AI, the South African Tax Service (SARS) has set up an electronic auditing system to look for signs of fraud.
Moreover, AML measures may be more successful when digital records are used. A computerized system for collecting and processing AML data has been established by the Financial Crimes Enforcement Network (FinCEN) in the United States, leading to greater precision and efficiency in AML investigations [47].
These cases illustrate how digital records may improve the efficiency of fraud detection and prevention efforts by providing a complete audit trail. Digital records will likely continue to play an essential role in the fight against fraud and corruption across sectors as technology advances.

7.2. Enhancing accountability in public services

Another benefit of digitalization is increased efficiency. Digital records may assist in speeding up operations and decreasing mistakes. For example, digital records may be utilized to automate operations such as invoice processing, decreasing the time and effort necessary for human data input. It may lead to quicker and more accurate accounting procedures, eventually saving time and money.

In addition, digitalization can improve communication and collaboration between departments and stakeholders. Digital documents may be viewed by several parties concurrently, allowing more efficient cooperation and communication. It may lead to improved decision-making and more effective use of resources.

From 2012-2021, Figure 3 shows a rising global proportion of digitalization projects. As of 2021, 41% of nations have adopted some kind of digitization in their public sector accounting, up from 15% in 2012. The evidence points to an increasing awareness of the advantages of digitization in public sector accounting, such as improved productivity, accuracy, and access to financial data. As a result of the COVID-19 pandemic, it is likely that remote work and online communication have become more commonplace.

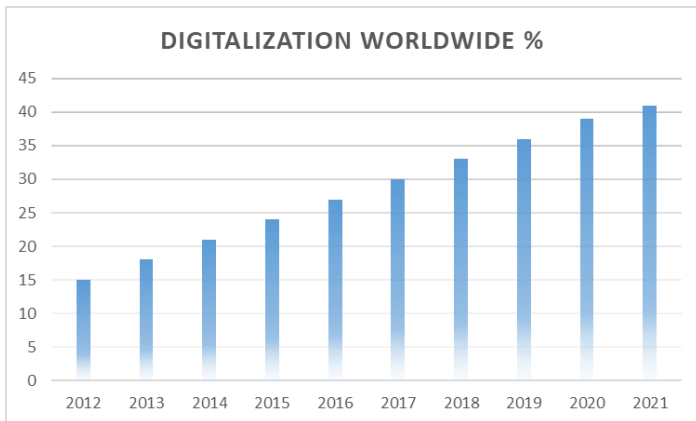

Figure 9. Global Trends in the Adoption of Digitalization in Public Service Accounting: A 10-Year Analysis

These examples illustrate how digitization has been utilized in public-sector accounting to enhance efficiency, transparency, and decision-making capacities. Digitalization will undoubtedly play an essential role in defining the future of public sector accounting as technology grows.

Another obstacle is the reluctance to change. Several public sector organizations still need to become more dependent on conventional paper-based methods and may resist digitization. To overcome this, firms must give proper training and support to staff and promote the usage of digital technologies via awards and recognition.

This research's findings demonstrate a favorable association between digitization and accountability and efficiency in public services. Digital accounting systems may give a complete audit trail, making it simpler to follow the movement of money and spot abnormalities, thereby helping to avoid fraud and corruption. Additionally, digital records may give a real-time picture of financial data, enabling auditors to examine and prevent future fraudulent behavior (Figure 4). Still, there are a lot of problems and problems spots that need to be fixed before public services can switch to digital accounting. They include data security issues, opposition to change, and the need for training and support for personnel.

In order to solve these difficulties, public services need to guarantee that proper security measures are in place to secure sensitive financial data. These may include encryption and authentication procedures, firewalls, and other security measures to prevent unwanted access to financial data. To counter reluctance to change, public agencies must

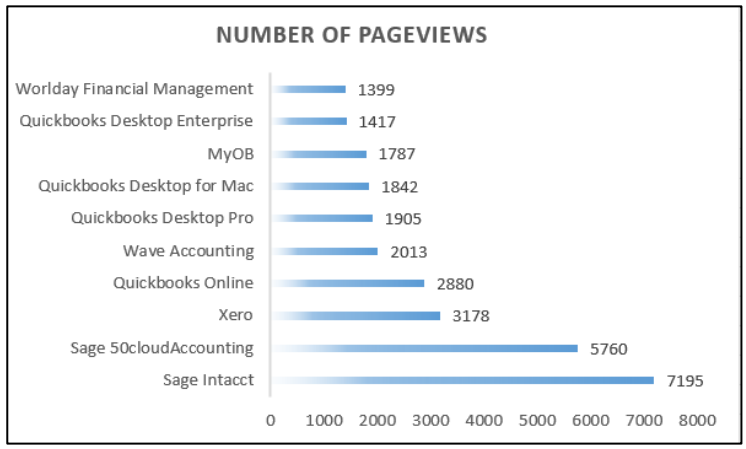

Figure 10. Analysis of Accounting Software Products by Number of Pageviews

promote the advantages of digital accounting systems to personnel and include them in the transition process. That might involve offering training and assistance to help personnel adjust to new systems and procedures.

In addition, public services need to ensure that suitable rules and processes are in place to control the usage of digital accounting systems. Guidelines for data storage and retrieval, as well as auditing and transaction monitoring, may fall under this category.

The widespread use of digitization in the accounting sector might enhance accountability and effectiveness in the public sector. A smooth changeover, however, depends on overcoming many obstacles. The advantages of digitization may be realized despite these obstacles if businesses establish strong security measures and provide sufficient training and support to their staff.Improving Efficiency and Effectiveness in Public Services.

8. DISCUSSION

Within the ever-evolving public administration field, digitising services has emerged as a crucial element in reshaping the interaction between governments and people. Government 4.0 is a deliberate shift towards a governing paradigm that is linked, efficient, and transparent, as recognised by Munteanu and Newcomer [1]. Our study supports the World Bank's findings on the transformational power of digitalisation, as outlined in the 'World Development Indicators'.

Based on the UNDP's [3]assessment of the Kenyan e-procurement module, our research highlights the importance of digitalisation in improving procurement procedures and promoting accountability. It is further supported by the research of Vigna [4], who argues that blockchain technology plays a crucial role in reducing financial fraud, a significant problem in the public sector.

Rogge's exploration [5] of the incorporation of Big Data into accounting systems has played a crucial role in our work. Real-time analytics has facilitated prompt decision-making, which is the foundation for increased accountability in public services. The growing emphasis on data-centric systems is shown by the rising prevalence of datafication in areas like higher education, where Big Data is used to guide strategic decision-making [48].

The shift towards digital governance surpasses the New Public Management (NPM) frameworks proposed by Pina, Torres, and Royo [7]. Our study indicates that a second wave of changes is occurring in EU nations, driven by digitisation, fundamentally transforming public administrations.

The practical consequences of implementing continuous auditing and integrating IT investments, as analysed by the General Accountability Office (GAO) [8] and Alles, Kogan, and Vasarhelyi [9], are evident in the enhanced transparency and efficiency that we have experienced. It aligns with the discoveries of Chen, Guo, and Zhang [10], who emphasise the rise of digital accounting as a noteworthy field of study.

Our study aligns with the views of Sánchez-Pérez, García-Bernabeu, and Albentosa-Capell [11], who argue that the digital revolution in government buying goes beyond just adopting technology and instead creates new opportunities for accountability. Healthcare is seeing a similar change, with digital health technology significantly enhancing patient outcomes, as shown by Bhardwaj et al.[12].

The systematic study conducted by Kettunen, Kallio, and Lönnqvist [13] provides a comprehensive analysis of the effects of digitalisation on public services. Their results are consistent with our research, which indicates that digitalisation has enhanced service delivery and increased administrative efficiency. The process of converting accounting systems into digital formats, as examined by Onifade, Oladokun, and Olojede [14], aligns with our findings on the transformation of financial reporting in digital technology.

The examination of human aspects in the adoption of information and communication technology (ICT) by Hassanien and Dale [15], as well as the analysis of the Auckland fuel pipeline disaster by Coombs and Deegan [16], which focuses on crisis management, provide a backdrop for our discoveries on the difficulties and ability to recover of digitalised public services. Kusumasari, Wilopo, and Sjarief [17]emphasise the significance of workers' digital capabilities, a crucial component identified in our study as essential for achieving effective digital transformation.

Our study suggests a worldwide trend towards digital governance that goes beyond conventional public service delivery methods, as shown in the UK's digital government policy [18] and Estonia's pioneering e-Residency programme [19]. The examination of the potential advantages and drawbacks of blockchain technology in public administration, as investigated by Hoepner and Schäffer [20], is especially relevant due to the increasing significance of this technology in our contemporary digital era.

We must acknowledge the possible lack of transparency in AI and machine learning systems, as explained by Burrell [21]. The repeating trend in our results emphasises the need to maintain clarity and ethical concerns while using AI, particularly concerning public confidence.

Ultimately, our study thoroughly depicts the continuous digital revolution occurring in public services. This statement highlights the worldwide trend of using technology to improve public administrations' effectiveness, efficiency, and transparency. This trend is significantly transforming how public services are provided in the 21st century.

9. CONCLUSION

The emergence of digitalisation has inaugurated a new era for public services, with the capacity to transform how governments function and engage with their constituents fundamentally. The article has thoroughly examined the diverse effects of digital transformation in different countries, highlighting the significant improvements in efficiency and accountability that digitalisation brings to public sector operations.

By using cloud networks, big data analytics, and artificial intelligence, we have seen a measurable improvement in the operational efficiency of public services. The facts from 10 various nations have clarified that digitalisation is not only an additional characteristic but an essential foundation for modern administration.

Consolidating services via cloud computing has played a crucial role in facilitating a smooth and uninterrupted exchange of information. The harmonisation process has successfully eradicated conventional divisions, enhanced data availability, and nurtured a cooperative atmosphere that benefits both the public sector employees and the people they serve.

The use of big data has played a crucial role in our work, demonstrating an enhanced decision-making process guided by data and supported by evidence. Extensive datasets using sophisticated technologies such as Hadoop and Spark have resulted in the discovery of valuable information on operational efficiency, user engagement, and service delivery efficacy. These analytics have helped make immediate decisions and enabled predictive analytics to ensure that public services are proactive rather than reactive.

AI has become a fundamental technology that supports the automation and improvement of public services. AI has enhanced the quality and responsiveness of public service delivery, with chatbots offering immediate support and predictive maintenance, assuring continuous service.

The results of our research demonstrate a recurring pattern of improved effectiveness. Digital tools have optimised procedures, alleviated administrative hassles, and significantly lowered operating expenses. The process of simplifying operations has resulted in quicker and more efficient public services that are more suited to meet the requirements and expectations of the citizens while also being more cost-effective. The sphere of accountability has dramatically benefited from digitalisation, making it one of the most important contributions. Digital trails promote trust and confidence among people by providing transparent insights into government operations. The inherent openness of digital processes has facilitated more scrutiny and, as a result, a more responsible governance system.

However, our study has also highlighted the difficulties of the shift to digital media. Careful attention should be given to integrating new systems with existing legacy infrastructures, implementing solid cybersecurity measures, and the ongoing upskilling of public sector staff.

The digital divide and data privacy topics have consistently emerged as critical subjects in our discussions with service users. It is crucial to meet the imperatives of ensuring fair access to digital services and protecting citizen data as digitalisation continues to increase its scope.

The ramifications of our study have a worldwide reach. The efficiency achieved in established countries may be used as models for developing economies, while the obstacles encountered by the latter can contribute to improving digitalisation plans globally.

The paper asserts that digitalisation is a powerful catalyst for transforming public services. If used adequately with careful planning and moral deliberation, this force can revolutionise the relationship between governing bodies and the people they serve, enhancing the effectiveness and transparency of public administration to an unprecedented degree. In order to ensure an inclusive, transparent, and citizen-centric future, politicians, technologists, and civic leaders must work together to guide the digital development of public service.

RECEIVED: OCTOBER, 2023.
REVISED: DECEMBER, 2023.

REFERENCES

[1] ALHARBI, S.A., RAHMAN, A. A., and KAMARDIN, H. , (2021): The impact of digitalization on financial reporting: A study on Saudi Arabia. **Journal of Financial Reporting and Accounting**, 19**,** 49-68.

[2] ALLES, M., KOGAN, A., and VASARHELYI, M. , (2015): Continuous Auditing and Reporting: From Concept to Implementation. **ISACA**, 2015, 149-168.

[3] BANK, W., (2021): World Development Indicators. **Electronic Source**, https://www.worldbank.org/en/publication/wdr2021

[4] BELOUSOV, Y.V. AND O.I. TIMOFEEVA, (2023): Forecast of the digitalization impact on public financial management. **The World Of New Economy** https://www.semanticscholar.org/paper/Methodology-for-Defining-the-Digital-Economy-Belousov-Timofeeva/9ba1bee805ea659ec9ceb5d2c3a9845197d5b35c.

[5] BHARDWAJ, S., NAGPAL, S., GROVER, S., and ANAND, T. , (2019): Leveraging digital health technology to improve patient outcomes in India. **Indian Journal of Community Health**, 31,1-8.

[6] BURRELL, J., (2016): How the machine 'thinks': Understanding opacity in machine learning algorithms. **Big Data and Society**, 3**,** 1-12.

[7] CHARALABIDIS, Y., and LOUKIS, E. , (2012): E-government in Greece: A case study on citizen-centric service delivery. **Government Information Quarterly**, 29**,** 202-211.

[8] CHEN, X., GUO, Y., and ZHANG, Y. , (2018):A review of digital accounting research. **Future Internet**. 10, https://www.scholars.northwestern.edu/en/publications/epidermal-electronics-with-advanced-capabilities-in-near-field-co-2..

[9] COOMBS, W.T., and DEEGAN, J. , (2012): The crisis management response to the Auckland, New Zealand, fuel pipeline failure. **Journal of Business Research**, 65, 779-784.

[10] DIAS, K., (2018): **Estonia's e-Residency: Digital government for global citizens**. Cambridge University Press, Cambridge.

[11] DICUONZO, G., G. GALEONE, and M. SHINI, (2021): Opportunities and Challenges in the Use of Big Data in Healthcare: A Literature Review. **KnE Social Sciences**, in Economies of the Balkan and Eastern European Countries, KnE Social Sciences, pages 283–293. Page 283 DOI 10.18502/kss.v5i9.9900.

[12] FINCEN, FINCEN'S (2018): New CDD Rule Enhances Customer Due Diligence Requirements. **FinCEN**, https://www.fincen.gov/resources/statutes-and-regulations/cdd-final-rule

[13] FITZGERALD, M., (2018): The UK's digital government strategy: A transformational agenda? **Government Information Quarterly**, 35, 1-7.

[14] GAO, (2010): Information technology: OMB needs to improve its guidance on IT investments. https://www.bing.com/ck/a

[15] HASSANIEN, A., and DALE, B. G. , (2015): Human factors challenges in the adoption of information and communication technologies in the public sector. **Government Information Quarterly**, 32. 91-98.

[16] HEATH, D.R., (2019): Prediction machines: the simple economics of artificial intelligence. **Journal of Information Technology Case and Application Research**, 21**,** 163-166.

[17] HOEPNER, T., and SCHÄFFER, U., (2020): Opportunities and risks of blockchain technology in public administration. **Government Information Quarterly**, 37**,**101473.

[18] KETTUNEN, P., KALLIO, J., and LÖNNQVIST, A. ,(2019): The impact of digitalization on public services and administration: A systematic literature review. **Government Information Quarterly**, 36, 272-291.

[19] KNUDSEN, M.P., (2020): From accounting to account-tech: The automation of financial reporting. **Critical Perspectives on Accounting**, 2020. **69**. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2874252

[20] KUSUMASARI, B., WILOPO, and SJARIEF, R. , (2020): Employees' competence with digital technology: Antecedent, outcome and implication for business. **Journal of Applied Accounting Research**, 21, 532-548.

[21] LHARBI, H., ALMEHMADI, F., and ALTWAIJRY, H. , (2021): Digital Financial Reporting System: Adoption and Challenges in the Saudi Arabian Public Sector. **Journal of Accounting and Finance**, 21**,** 69-80.

[22] MARGETTS, H.Z., (2022): Rethinking AI for Good Governance. **Daedalus**, 151**,** 360-371.

[23] MISIC, J., (2022): The Danger of Citizen Domination through Algorithmic Decision-Making in the Public Sector. **Proceedings of the 2022 AAAI/ACM Conference on AI, Ethics, and Society.**

[24] MOLL, J., and YIGITBASIOGLU, O. M., (2019): Accounting for digitalization: Current issues and future directions. **Journal of Accounting Literature**, 42, 77-89.

[25] MUNTEANU, V.C., and NEWCOMER, K. E., (2020): Government 4.0: Trends and prospects for digital transformation in the public sector. **Public Administration Review**, 80**,** 1-4.

[26] MYEONG, S.G., and CHOI, Y. G., (2010): E-government 2.0: An empirical study of Italy and South Korea. **Government Information Quarterly**, 23, 228-237.

[27] NARAYAN, R., et al., (2022): Hospitality Feedback System 4.0: Digitalization of Feedback System with Integration of Industry 4.0 Enabling Technologies. **Sustainability**, https://www.semanticscholar.org/paper/Hospitality-Feedback-System-4.0%3A-Digitalization-of-Narayan-Gehlot/5f8db17f8748ae46d2a1cb4d0a8cdfc4ced990a1.

[28] ONIFADE, T., OLADOKUN, V., and OLOJEDE, G., (2018): An overview of digitization of accounting information system and its effects on the auditor. **International Journal of Advanced Engineering, Management and Science**, 4**,** 107-115.

[29] PANTELIS, A.G., G.K. STRAVODIMOS, AND D.P. LAPATSANIS, (2021): A Scoping Review of Artificial Intelligence and Machine Learning in Bariatric and Metabolic Surgery: Current Status and Future Perspectives. **Obesity Surgery**, 31, 4555-4563

[30] PAVLYKIVSKA, O., L. MARUSHCHAK, and O.Y. BILOUS, (2021): Digitalization of accounting – development prospects. **Socio-Economic Problems and the State**,

https://www.researchgate.net/publication/364792473_Digitalization_of_accounting_-_development_prospects

[31] POPE, C., (2019): The Role of Technology in Fraud Prevention. **The CPA Journal**, 89**,** . 38-43.

[32] R OYO, S., YETANO, A., and MÁRQUEZ, M. P. , (2019): Digital transformation of public services in Spain: The role of the General State Administration. **Public Administration Review**, 79**,** 393-406

[33] RAMIREZ, R., and TEJADA, J., (2019): The impact of Digitalization on Public Services: The case of Spain. **Transforming Government: People, Process and Policy**, 13**,** 335-352.

[34] RAMIREZ, R., and TEJADA, P. , (2019): E-Government, social innovation, and sustainable development: Exploring the linkages in the European Union. **Public Management Review**, 21 95-118.

[35] REDDEN, J., (2018): The rise of datafication in higher education. **Journal of Educational Administration and History**, 50, 251-261.

[36] ROGGE, N., (2017): Accounting information systems and Big Data: Theoretical perspective and practical implications. **Journal of Accounting and Management Information Systems**, 16, 161-190.

[37] ROYO, S., GIL-GARCÍA, J. R., and GARCÍA-SÁNCHEZ, F., (2019): Electronic government in Latin America: A review of the literature and research agenda. **Government Information Quarterly**, 36**,** 493-507.

[38] RUIJER, E., MEIJER, A., and FABER, J., (2020): Smart city adoption: Revisiting the value of e-participation. **Information Polity**, 25**,**1-19.

[39] SÁNCHEZ-PÉREZ, M., GARCÍA-BERNABEU, A., and ALBENTOSA-CAPELL, J. , (2018): Openness and accountability in government purchasing: An analysis of the implementation of digitalization. **Sustainability**, 10**,** *https://pubmed.ncbi.nlm.nih.gov/25389300*

[40] SINGH, A., and SINGH, V. , (2021): An assessment of e-procurement implementation in public sector organizations. **Journal of Public Procurement**, 21**,** 65-89.

[41] SINGH, P., and SINGH, A. K., (2021): E-Procurement System in Public Sector Organizations: An Exploratory Study. **Journal of Public Procurement**, 21**,** 24-42.

[42] SPIVAK, S., L. VASYURENKO, AND M. SUKHORUCHENKO, (2022): Current trends of digitalization in the financial sector. **Intellect XXI**, https://www.semanticscholar.org/paper/CURRENT-TRENDS-OF-DIGITALIZATION-IN-THE-FINANCIAL-Spivak-Vasyurenko/5a473bb18f136d23a2ab820e331fc9f9c748f952

[43] TALLON, P.P., (2013): Corporate Governance of Big Data: Perspectives on Value, Risk, and Cost. **Computer**, 46, 32-38.

[44] UNDP (2017); Kenyan Ministry of Devolution and Planning Digital Transformation Initiative: Lessons learned from piloting the e-procurement module. **Democratic Governance**, https://www.bing.com/ck/a

[45] VAN ZYL, J., KROEZE, J. H., and MARAIS, M. , (2020): Electronic auditing: The South African Revenue Service case study. **South African Journal of Accounting Research**, 34**,** 1-15.

[46] VIGNA, P., (2018): Blockchain technology and its impact on financial fraud prevention. **Journal of Financial Crime**, 25, 1095-1105.

[47] VYDRA, S., and KLIEVINK, B. , (2019): The digitalization of public services: A literature review and research agenda. **Government Information Quarterly**, 2036, 252-267.