A critical review of the enablers and constraints of artificial intelligence in the South African public sector

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ABSTRACT

Purpose of the study: Artificial intelligence (AI) is increasingly reforming the value chain activities of the public sector to meet the citizens' demands, thus triggering the need to comprehend the enablers and constraints in the industry. This study provides a critical review of the enablers and constraints to the adoption of artificial intelligence (AI) in enhancing public sector management practices in South Africa.

Design/methodology/approach: The study employs a qualitative approach, utilising a critical document review (an unobtrusive form of research) and the extensively applied Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) to analytically investigate the enablers and constraints of AI adoption in enhancing management practices in the South African public sector. The literature was sourced from the Web of Science search engine from 2022 to 2025.

Findings: The study aimed to critically review the enablers and constraints of AI adoption to enhance South African public sector management practices. The results of the study reveal that even though AI releases a plethora of opportunities for public sector organisations, such as intensified operational efficiency, cost-effectiveness, increased productivity, and effective disbursement of resources, it has also been linked to the possibility of job displacement, ethical issues (such as data privacy and security, transparency and accountability) and AI legal and regulatory frameworks (governance) issues.

Recommendations/value: This study contributes to management research by identifying and critically evaluating the prevalent enablers and constraints in AI adoption and implementation in emerging economies,

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such as South Africa. It recommends the enforcement of ethical and regulatory frameworks for navigating the adoption of AI technologies in enhancing management practices in the South African public sector. Furthermore, the study adopts Tornatzky and Fleischer's (1990) technology-organisation-environment framework to appraise the public sector organisations in terms of the three contextual factors.

Managerial implications: The study sheds light on the *current state of policies and strategies that are significant for governing and enhanc*ing AI adoption in advancing management processes within the South African public sector. Considering that South Africa is not exempt from achieving the United Nations' Sustainable Development Goals (SDGs) Vision and Trajectory 2030, the study provides crucial insights and guidelines to policymakers, practitioners, and decision-makers as a basis for managing AI adoption and improving general management processes in the South African public sector.

Keywords: Artificial intelligence; public services; PRISMA; public sector; South Africa

1.   INTRODUCTION

Artificial intelligence (AI) has become fundamental in several aspects, one of which is streamlining management processes (Raisch & Krakowski, 2021). Globally, the rapid growth of AI applications in contemporary business management has significantly enhanced public administration and the delivery of public services to citizens through digital transformation (Rekunenko *et al.,* 2025). This has been accelerated by the repercussions of the COVID-19 pandemic, which compelled governments to move away from conventional paradigms and offer digital (electronic) services to the public and diverse stakeholders. Generally speaking, AI has experienced rapid development and advancements, particularly in the most innovative economies, such as the United States of America (USA), the European Union, Australia, and Japan (Cloete, 2024). While these countries have reaped the potential rewards of this cutting-edge technology, emerging countries like South Africa still face hiccups that impede their realisation, particularly in the public sector (Mangundu, 2025). Despite these debates, it is argued that, although AI has been extensively explored in the Information Systems (IS) academic realm, there is a paucity of research that entirely addresses the concept of AI and its management in public administration (Mergel *et al.,* 2023).

Presently, although there have been few studies focusing on AI by management researchers, particularly in the last two decades (Raisch & Krakowski, 2021), governments are finding ways to reimagine and reshape public services through digital transformation and superseding traditional human decision-making, one of which is adopting AI-enabled technologies (automated decision-making). To this end, however, only a few AI initiatives (e.g., facial recognition, virtual agents) have been realised in the public sector, owing to a considerable gap in the acceptance and implementation of AI applications in providing services to the public

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(Mergel *et al.,* 2023). This argument is consistent with the view of Van Noordt and Tangi (2023), who corroborate that despite AI technologies gaining prominence in academic discourse and practicability in the public sector at large, the determinants hampering its progress have been associated with the absence of AI capability (i.e., public servants' limited proficiency to deal with AI systems and models). Notwithstanding this, the United Nations (2024) stresses that AI-based technologies have been regarded as powerful tools that address socio-economic disparities (e.g., poverty) and boost economic growth in response to the national development priorities and strategies, intending to attain the National Development Plan's Sustainable Development Goals (SDGs) and Vision Trajectory 2030.

One of the key determinants hindering AI adoption, particularly in emerging economies, is the lack of appropriate or non-endorsed strategies, laws, and regulations governing digital technologies (Effoduh *et al.,* 2024; Plantinga, 2024; Rekunenko *et al.,* 2025). While these economies are confronted with a wide range of complexities in realising the capacity brought about by AI technologies (e.g., digital divide, inequality and infrastructural deficit), they often encounter ethical challenges resulting from policy issues (Diallo *et al.,* 2025). It includes ethical concerns such as data protection, privacy, security, transparency, accountability, and public trust (Madan & Ashok, 2023; Chilunjika, 2024). Hence, there are frequent cyberattacks and data hacking in public sector management, especially in the African continent (Pieterse, 2021). However, having been lauded as a powerful tool vital to tackling enormous challenges in the public sector, AI-powered technologies have been pervasive in the management of diverse industries such as healthcare, education, transport, and municipal services, leading to tremendous enhancement of human lives and efficient access to public services (Mahusin *et al.,* 2024; Alaran *et al.,* 2025).

Like several other emerging economies globally, the South African public sector's capacity to embrace AI-driven technologies to succeed in the ever-changing digital environment is non-trivial. With the increasing demand for digitalised public services in the current digital landscape, the management of the AI aspect cannot be overemphasised if the capacity to innovate the public administration is to be enhanced in the country. Despite this, the South African public sector continues to introduce new AI technologies to enhance service delivery. For example, the Department of Home Affairs has introduced the Automated Biometric Identification System, an AI-driven system aiming to match people's fingerprints, faces and palm prints (Marakalala & Matlala, 2024). Additionally, the South African Revenue Service (SARS) has recently introduced the AI Assistant Chatbot, in conjunction with the e-filing system, which aims to facilitate the automated processing of tax returns (Molobela, 2025). These digital initiatives are significantly improving service delivery to the citizens. Thus, it is

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against this background that this study examines the enablers and constraints of AI technologies to improve management practices in the South African public sector. The subsequent section describes the research problem and objectives.

2. PROBLEM STATEMENT AND RESEARCH OBJECTIVES

As AI becomes increasingly prevalent in management milieus, scholars' insights become even more valuable. Although AI has been applauded for its potential to increase operational efficiency in the provision of public services (Mahusin *et al.,* 2024; Barodi & Lalaoui, 2025), the South African public sector's adoption of AI into its systems appears to be lagging. While the private sector in South Africa may have accelerated the adoption of AI-related initiatives and automated processes in its operations to streamline managerial tasks, the public sector is hindered by glitches that impede its adoption and implementation (Bester, 2024). Having been in its nascent phase, the country is still devising methods and techniques to fully integrate AI into its existing government digital infrastructure, public management processes, and decision-making procedures, aiming to augment performance and increase citizen engagement and participation (Cloete, 2024). Furthermore, apart from the progress made in embracing the Fourth Industrial Revolution (4IR), policy enforcement related to the adoption of AI in public management has been identified as a barrier to the realisation of digital initiatives in South Africa (Cloete, 2024; Shibambu & Ngoepe, 2024). While ethical issues (such as privacy, data protection and trust, among others) pertaining to AI have also been perceived as adverse contributors to 4IR initiatives (including AI) in most governments across the globe (Madan & Ashok, 2023; Mahusin *et al.,* 2024; Plantinga, 2024), South Africa is no exception. Furthermore, South Africa is still anticipated to achieve the fast-approaching United Nations' SDGs, specifically poverty eradication, inequality reduction, industrialisation, innovation, and infrastructure development. Against this background, this study aims to critically evaluate the enablers and constraints of AI adoption to improve management practices in the South African public sector with the following specific objectives:

- To explore the opportunities and threats generated by AI-powered technologies in the public sector.
- To describe the ethical challenges associated with AI adoption in the public sector.
- To appraise the policies and strategies governing AI and other emerging digital technologies in the management process of the South African public sector.

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3.   LITERATURE REVIEW

This section underscores the literature review on AI adoption in the public sector. The study commences with a theoretical framework that guides the research, followed by an elucidation of the enablers and constraints of AI in public sector management. It culminates with identifying studies on AI in the South African public sector setting.

3.1   Theoretical framework

This study is underpinned by the technology-organisation-environment (TOE) framework developed by Tornatzky and Fleischer (1990). The rationale for adopting the TOE theory stems from the novelty of AI in the South African public sector. The theory helps evaluate the condition of public sector institutions in terms of the three key contextual dimensions: technology, organisation, and environment, whenever these organisations necessitate embracing and implementing digital technologies and innovations (Baker, 2012). Despite its extensive application in IS research by scholars, TOE has been lauded for its practical organisational evaluation when confronted with technology adoption using these key contextual dimensions (Bryan & Zuva, 2021). The technology dimension considers the digital (technological) offerings relevant to adoption by public sector institutions. The organisational dimension involves the assessment of internal strengths (skills, organisational culture, organisational leadership capability, and incentive systems) that are viable for accepting digital technologies by the public sector (Baker, 2012). It also includes the magnitude of the organisation in terms of scope and size. The environment dimension entails the public sector scanning external conditions to detect opportunities or threats that can enable or constrain technological advancements and innovations. It also includes legal and regulatory frameworks essential for guiding 4IR technologies (Tornatzky & Fleischer,1990).

3.2   Artificial intelligence in the public sector: Enablers and constraints

According to the European Commission (2019:1), AI is defined as "systems that display intelligent behaviour by analysing their environment and taking actions – with some degree of autonomy to achieve specific goals". While AI-powered techniques can be strictly software-based (e.g., virtual assistants, deep learning) and are applied in the virtual domain, they can also be integrated into hardware tools (e.g., the Internet of Things). Mergel *et al.* (2023:2) clarify the concept of AI by considering the determinants of technology: "the thought process and reasoning dimension and the behavioural dimension of humans that are then carried out by machines". The authors corroborate that AI-driven technologies or systems employ intellectual reasoning to predict individual behaviour through modernised techniques such as computer vision, digital assistants, language learning, machine learning, and robotics. They

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further underscore four diverse factors to AI: (1) "machines that think like humans, (2) machines that act like humans, (3) machines that think rationally, and (4) machines that act rationally" (Mergel *et al.,* 2023:3).

Broadly speaking, notwithstanding the increasing research interests and debates in the literature and rapid evolution that endures, unlocking prospects for AI in public sector management, the execution of AI-related strategies, specifically in emerging economies like Africa (including South Africa), remains a nightmare (Plantinga, 2024; Barodi & Lalaoui, 2025; Diallo *et al.,* 2025). Contrariwise, meanwhile, advanced economies have made great strides and significant investments in the implementation of AI initiatives to support management processes; they have realised benefits and opportunities linked with these trailblazing technologies (e.g., robotics, machine learning, virtual assistants, etc.) (Cloete, 2024; Rekunenko *et al.,* 2025). Most remarkably, in these economies, the public service processes have been redefined, leveraged, streamlined, and modernised to ensure the automation of systems, thus leading to improved efficiency, increased citizen engagement, effectiveness, and customised service delivery to the public (Androniceanu, 2024; Longo, 2024; Tomazevic *et al.,* 2024).

The burgeoning application of AI-powered technologies in providing public services not only poses policy and regulatory frameworks conundrums but also creates perils for its users (Mangundu, 2025). Research indicates a scarcity of proper digital policies and legal frameworks guiding the public sector's managers in the adoption of AI technologies and innovations, despite a rising trend (Chilunjika, 2024; Effoduh *et al.,* 2024; Tomazevic *et al.,* 2024). This is supported by Kremer *et al.* (2023:1), who argued that "across industries, gen AI adoption has presented a new challenge for risk and compliance functions: How to balance the use of this new technology amid an evolving – and uneven – regulatory framework". Yet, diverse models have already been established in the academic discourse to ensure the successful adoption of AI in the public sector, particularly in the African context (Nene & Hewitt, 2023; Plantinga, 2024; Diallo *et al.,* 2025). Although these models are context-dependent, they cannot be regarded as comprehensive approaches to managing various phenomena.

3.3   South African public sector studies on artificial intelligence

Regardless of its embryonic stage in public sector management, research on AI is gaining recognition in South Africa. As such, scholars have emphasised their studies on AI-based technologies in different domains, such as public health (Nene & Hewitt, 2023), higher education institutions (HEIs) – public universities (Funda & Piderit, 2024; Opesemowo & Adekomaya, 2024; Mangundu, 2025), local government (Bester, 2024), and public

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administration (Chilunjika, 2024; Motadi, 2024). Table 1 reflects the studies conducted on AI in South Africa.

Table 1: Studies on Artificial Intelligence in South Africa

Author	Objective	Findings
Bester (2024)	To investigate the readiness of South African rural municipalities to adopt and utilise AI technologies in delivering services.	AI has improved the internal business processes of rural municipalities and tightened communication with the public. Limited skills, inadequate funding and absence of policy strategies.
Motadi (2024)	To probe the role of AI in remodelling the South African public administration, focusing on the benefits and drawbacks.	Infrastructural deficit, digital divide and paucity of AI proficiencies were perceived as constraints hindering the uptake of AI in the South African public sector.
Funda and Piderit (2024)	To examine the importance of AI in providing improved teaching and learning systems, as well as overall pedagogical performance.	Although factors such as non-readiness and inequality were identified, the advent of AI in South African HEIs has transformed teaching and learning by integrating virtual learning platforms.
Opesemowo and Adekomaya (2024)	To explore the obstacles and approaches related to the uptake of AI in South African HEIs.	AI-powered technologies have enhanced student participation and learning by fostering a cooperative, inclusive, and vibrant classroom atmosphere.

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3.4   Comparative analysis between South Africa and advanced economies

Contextual determinants emanating from the external business circumstances profoundly influence how AI is developed and implemented in emerging and advanced economies. For example, even though South Africa has been at the forefront of 4IR technology adoption compared to several countries in the continent (United Nations, 2024) and is regarded as one of the best in terms of readiness for AI technologies (Cloete, 2024), the country has been inundated with AI regulatory flaws and ethical conundrums (Chilunjika, 2024). To support this, Baloyi *et al.* (2025) conducted a comparative analysis between Africa and the USA regarding digital transformation (including AI) in various sectors (e.g., healthcare services, education, etc.) within the public sector. They opine that the rapidity of implementing cutting-edge digital technologies, such as AI, in delivering efficient public services varies intensely across Africa, and South Africa is no exception.

 All things considered, the investment in a comprehensive funding methodology for digital ideas has been regarded as a fundamental determinant accelerating the adoption of AI by several governments (United Nations, 2024). In other words, funding for AI is particularly crucial for the South African government as it intends to digitalise and streamline public services in response to the growing need for automated services. For instance, while the South African government is faced with budgetary constraints for digital initiatives, the USA invested in several digital funding plans in cooperation with the private sectors, including "research and development grants, venture capital, corporate partnerships, philanthropic funding and the Connect America fund" (Baloyi *et al.,* 2025:5). It is asserted that without ring-fenced financing for AI adoption and other digital technologies (e.g., cloud computing, big data, virtual platforms, etc.), public sectors can find it complex to embrace automated decision-making in dealing with essential services (Plantinga, 2024). At the hub of this misfortune, the South African public sector can remain stagnant in its pursuit of AI initiatives, failing to achieve the SDGs.

4.   RESEARCH DESIGN AND METHODOLOGY

Guided by the constructivist paradigm, this study employs a qualitative approach, emphasising critical document review (an unobtrusive form of research) and extensively uses the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) to identify the themes pertaining to the enablers and constraints of AI adoption to improve management practices in the South African public sector. The purpose of adopting PRISMA was to ensure an explicit, exhaustive, and rigorous process for detecting and selecting the existing body of knowledge (Page *et al.,* 2021) and to nurture a thematic analysis of scholarly debates, aiming to achieve

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theoretical saturation on the enablers and constraints of AI in the public sector. Document review is defined as "a systematic procedure for reviewing or evaluating documents, both printed and electronic material" (Armstrong, 2021:1). According to Wood *et al.* (2020), document review enables researchers to ensure critical investigation of the content gathered from credible, dependable and trustworthy sources produced by academic disciplinary experts, in this case, IS research experts.

Consequently, the rationale for embracing the document (systematic) method resides in the relevance and appropriateness of gaining intuitions and comprehension regarding a given phenomenon (i.e., AI in the public sector). The benefits of utilising document (systematic) review include the following: (1) since the method focuses on content (readily available information), it requires the lesser acquisition of ethical considerations; (2) the method depends on the sources available; therefore, it saves time and enhances cost-effectiveness; (3) the method creates an environment where researchers can gain prospects to conduct examination that would be complicated to do; and (4) the method can diminish interviewer prejudice/bias while gathering and transcribing data, thus leading to rigour (Morgan, 2022).

Initially, as PRISMA was employed, the literature search commenced with the comprehensive detection of AI and public sector concepts to ensure synergy and rigorous scrutiny of subject-related matters while maintaining linkage to the study's primary aim. The academic citations of the sources were retrieved from the Web of Science (WoS) search engine, a renowned database, as recommended by experts in the IS research discipline. Since digital technologies (including AI) can change over time due to unpredictable and volatile business environments, the search for the database was limited to the period ranging from 2022 to 2025. The procedure helped identify the most trending issues related to the subject matter (i.e., AI and the public sector) in the literature. Furthermore, the database search was restricted to the "*AI*", "*artificial intelligence*", "*public service*", "*public administration*", "*public services*", "*service delivery*", "*public sector*", "*document review*", "*document analysis*", and "*South Africa*" key concepts. Considering the search outcomes from the web, various studies were chosen and systematically reviewed to detect relevant themes and terminologies, and these findings were then aligned with the study's primary aim. Additionally, to ensure the credibility and quality of the data collection process, the sources obtained were carefully assessed using intellectual analysis, classification, assimilation, and reflexivity, whereby connotations were attributed to the data (Armstrong, 2021).

The entire search process yielded 830 sources of information from the WoS database search engine. From the 830 sources, after applying the inclusion and exclusion criteria (eligibility criteria), the researchers cleaned the data by deleting duplicates, non-English content, non-

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relevant information, and non-abstracts, resulting in 38 sources being considered after careful consideration and as suggested by disciplinary experts (Table 2). Moreover, as the study focused on the public sector milieu, grey literature (including government documents, such as reports, policy documents, and publications) was also considered. To this end, though, most sources consulted were peer-reviewed journal articles. Eventually, a total of 43 sources, including 35 journal articles, three conference papers and five grey literature, were included in the qualitative, document (systematic) review to derive the themes pertinent to this study. The search criteria were as follows.

Table 2: Eligibility criteria for gathering data

Dimension	Description
Publication	Peer-reviewed journal articles, conference papers and grey literature
Keywords search	AI, artificial intelligence, public service, public administration, public services, service delivery, public sector, document review, document analysis, and South Africa
Language	English
Period	2022-2025
Sector	Public and private sectors
Research approach	Qualitative and quantitative

Table 3 below illustrates the statistical contribution of sources consulted, categorised by number and percentage.
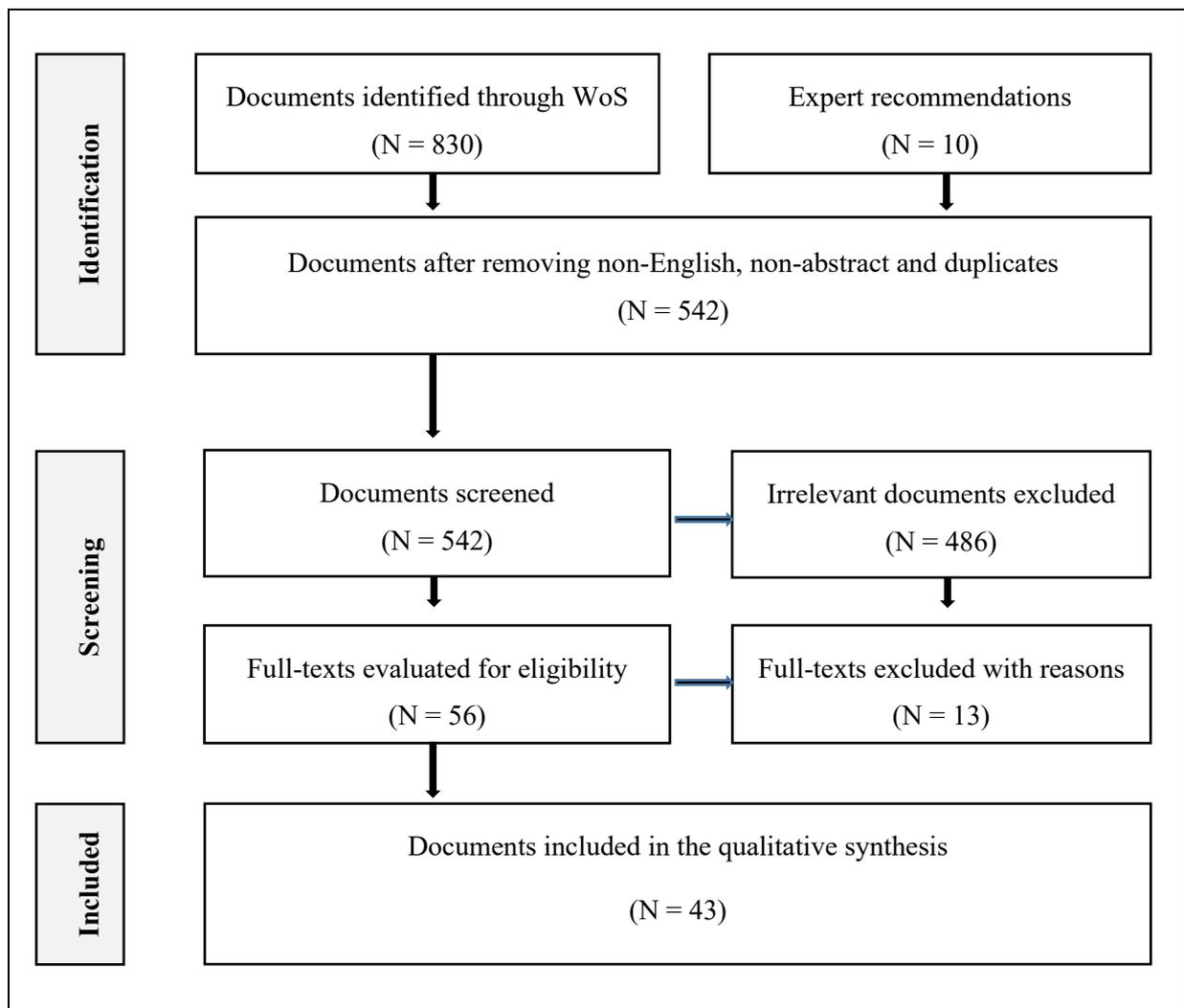
Table 3: Statistics of the sources consulted

Category	Number	Percentage contribution
Peer-reviewed journal articles	35	81%
Grey literature	5	12%
Conference papers	3	7%
Total	**43**	**100%**

The following phases were followed in identifying and selecting pertinent sources through WoS in this study.

- **Phase 1**: Sources identified through the WoS search engine were 830, ranging from 2022 to 2025, apart from the 10 suggested by the subject experts.
- **Phase 2**: After the removal of non-English, non-abstract and duplicate sources, 542 records remained, leading to the removal of 288 sources.

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- **Phase 3**: During the screening process, 486 full-text records were excluded based on irrelevance.
- **Phase 4**: After that, 56 sources were critically evaluated for eligibility criteria to ensure rigour in the study.
- **Phase 5**: Out of 56 sources, 13 sources were eliminated based on the eligibility requirements of the topic.
- **Phase 6**: A total of 43 sources, comprising peer-reviewed journal articles and conference papers, were deemed eligible for inclusion in the document (systematic) review.

Figure 1: PRISMA flow diagram

Source: Page *et al.* (2021)

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5. DISCUSSION OF THEMES EMANATING FROM THE DOCUMENT REVIEW

Although AI-based technologies offer opportunities from a public sector perspective, they are also associated with drawbacks that limit their full potential. A wide range of cutting-edge AI-powered technologies has been prevalent in improving internal processes and public services (Longo, 2024). These include, but are not limited to, machine learning, robotics, facial recognition, virtual agents, biometric identification systems, and healthcare (Androniceanu, 2024). The following sections provide a detailed discussion of the themes identified from the literature related to AI, including opportunities, ethical dilemmas associated with AI in public sector management, and digital policies and strategies for AI adoption to enhance management practices in the South African public sector environment.

5.1 Opportunities and threats brought by artificial intelligence in the public sector

AI in public sector management has brought several opportunities to render public services. Alaran *et al.* (2025) investigated the opportunities and hindrances of adopting AI in healthcare services in the African continent. It has been discovered that AI in African health services has been lauded for its capability to render manifold opportunities, such as ensuring cost-effectiveness, revolutionising disease surveillance, facilitating the easy detection of diseases, accessibility via telehealth, remote sensing, and the adequate allocation of scarce resources. Additionally, since AI-powered technologies are context-dependent, Longo (2024) argues that they have brought opportunities for public sector management, such as modernised internal administration and enhanced policy implementation. However, this may not be true in some emerging countries, such as South Africa. Similarly, it is corroborated that while AI technologies are remodelling the job descriptions of public servants, they are also interrelated with the restructuring of their responsibilities, leading to increased productivity, enhanced work proficiencies, and improved performance management in the public sector (Mahusin *et al.,* 2024). By doing so, the authors further substantiate that it leads to redesigned administrative functions (e.g., planning and organising), greater citizen participation, sophisticated public services, addressing multidimensional socio-economic complexities, and improved citizens' quality of life (Mahusin *et al.,* 2024).

Additionally, proliferating research on IS focused on the nexus between AI and a country's economic growth (Makridis & Mishra, 2022; Ndubisi & Kanu, 2022; Gonzales, 2023; Moyo, 2023; Saba & Ngepah, 2024; Trabelsi, 2024; Wang *et al.,* 2025). Even though some studies may not reflect the precise effect of AI technologies on the economic growth of the country,

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as the impact is multifaceted and a developing landscape, a strand of empirical studies confirms the positive relationship between the two variables (Gonzales, 2023; Saba & Ngepah, 2024; Wang *et al.,* 2025). It is argued that though AI may displace some of the current jobs, especially for low-skilled work streams in the real world using automation processes and systems, it is said to have revolutionised business operations and, at the same time, moderated operational expenses associated with managing the organisation while boosting the economy of the country (George, 2023). Aside from that, Choudhary (2024) emphasised that AI-related technologies have the potential to enhance productivity within an organisation, in addition to the numerous benefits they bring, such as streamlined workflows, cost savings, quality enhancement, effective resource allocation, automated decision-making, and a competitive advantage in the marketplace.

Regardless of the opportunities brought by AI as presented above, at the same time, it also raises threats in the public sector management, such as the skills gap, the absence of innovative organisational culture and possible job displacement (Chen *et al.* 2023; Madan & Ashok, 2023; Bester, 2024; Choudhary, 2024). Firstly, concerning the skills gap, it is essential to note that various studies cite AI technologies as being concomitant with the scarcity of appropriate competencies in the public sector (Androniceanu, 2024; Chilunjika, 2024; Mahusin *et al.,* 2024; Henk & Henk, 2025). It is argued that governments must overcome this threat by offering relevant training and re-skilling the public servants to ensure compatibility with the evolving digital projects (such as AI) while, on the other hand, collaborating with several stakeholders (including the public, academia and industries) to enhance knowledge and talent management practices in the public sector (Barodi & Lalaoui, 2025). That said, AI-led technologies also necessitate the acquisition of technical and specialised expertise and the development of a digital culture that is relatable to expedite the automated decision-making processes in delivering quality services to the citizens, notwithstanding the external forces resulting from the contemporary business management settings (e.g., political, economic, social, and technological) (Madan & Ashok, 2023).

Secondly, the absence of an innovative organisational culture can deter the efficient adoption of AI technologies in managing the public sector. As cited by Chilunjika (2024:402), "*AI is collaborative by nature; to train AI algorithms, it requires data sharing among various stakeholders and organisations*". Accordingly, the capacity to enhance data sharing across the public sector is crucial for intensifying AI policy formulation and implementation, thereby gaining public trust and ultimately thriving in the digital landscape, and achieving the long-term goals of public sector organisations (Henk & Henk, 2025). Yet innovative organisational culture plays an integral role within the organisation since it considers the most substantial

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stakeholders, such as the HEIs, industries and the public, in dealing with AI obstacles that obstruct its effective execution to realise cooperative digital solutions (Madan & Ashok, 2023). This culture fosters state-of-the-art technology by assimilating emerging digital technologies (e.g., AI) into internal public sector processes and systems to augment public services. However, AI presents potential challenges and prejudices (e.g., ethical dilemmas). This is consistent with the ideas of Shibambu and Ngoepe (2024), who opine that the uptake of 4IR technologies (including AI) in the contemporary public sector does not only revolve around the execution of those trailblazing technologies but also the process of linking the organisation's innovative culture and beliefs of the public servants with the chosen digital strategy (i.e., strategic management).

Lastly, despite its potential strengths in reforming public sector management (e.g., streamlined processes), AI has also increased the possibility of job displacement, leading to a higher unemployment rate (Bester, 2024; Anshari *et al.,* 2025). From this perspective, apart from the governments' capacity to establish an inclusive AI regulatory model which is pivotal to tackling the triple scourge or socio-economic disparities (i.e., poverty, inequality and unemployment), it is equally important to address the ethical concerns (data protection) that may negatively implicate the development and execution of AI-related strategies (Choudhary, 2024; Henk & Henk, 2025). Further, this is supported by Longo (2024), who states that public servants may suffer from job displacement due to the automation processes, which may, in turn, require their re-skilling and upskilling to survive in the ever-evolving and contemporary business environment.

5.2   Ethical issues associated with artificial intelligence in the public sector

Despite the increasing integration of AI into internal processes in the public sector, common ethical concerns persist regarding this ubiquitous technology. The following serve as ethical issues identified in the body of knowledge, including data privacy and security, transparency and accountability and AI governance issues (Chen *et al.,* 2023; Effoduh *et al.,* 2024; Mahusin *et al.,* 2024; Barodi & Lalaoui, 2025; Henk & Henk, 2025*).*

5.2.1 *Data privacy and security*

AI's data privacy and security in public sector management are the most topical issues discussed in IS research (Androniceanu, 2024; Effoduh *et al.,* 2024; Mahusin *et al.,* 2024; Plantinga, 2024; Rekunenko *et al.,* 2025). While AI-led technologies are being used to deliver efficient services in various sectors, such as healthcare, education, transportation, and municipal services, they heavily rely on gathering and interpreting vast amounts of individual data (Choudhary, 2024). Therefore, devising ways to enhance the application of data and

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maximise data privacy and security becomes central. For instance, most emerging African countries, including South Africa, are characterised by the lack of laws and regulations for enhancing AI data protection, or are in the process of developing these (Cloete, 2024; Diallo *et al.,* 2025). To this end, it raises enormous complexities concerning the possible misappropriation of confidential information belonging to individuals. Therefore, strong data security and access controls are imperative for sustaining the reliability and privacy of individuals' data, thereby circumventing illegitimate access or infringements (Alaran *et al.,* 2025).

5.2.2 *Transparency and accountability*

AI-enabled systems can be obscured, leading to obfuscations regarding automated decision-making procedures and exacerbating the progress of improving public values. For example, the absence of transparency in data application in public sector management has been regarded as an impediment to eroding societal trust (Mahusin *et al.,* 2024). Additionally, it is contended that whilst transparency "*leads to more correct decisions when algorithmic options are used to support human decisions*" (Madan & Ashok, 2023:11), accountability is "*a society-oriented value that captures the government's role of acting in the public's best interest*" (Chen *et al.,* 2023:9). Besides, whereas AI points to the ambiguity of accountability of data in terms of making informed decisions in public sector management, it creates room for reducing transparency through its functioning (Alaran *et al.,* 2025). That said, it can lead to intricacy and bias concerning AI-driven algorithms and decision-making processes. Accordingly, having explicit AI-related systems is crucial for fostering data accountability through their use, which creates room for developing reliable and transparent AI policy in the public sector to thrive in the digital domain (Chen *et al.,* 2023; Chilunjika, 2024).

5.2.3 *Artificial intelligence governance issues*

Developing and implementing strong ethical models and governance structures (e.g., ethics committee, ethics champion and ethics office) is fundamental to responding to ethical conundrums in generating AI policy in the public sector (Chilunjika, 2024). Most importantly, these ethical models and governance structures should be all-encompassing and far-reaching, considering the diverse perspectives of different stakeholders (both internal and external) that contribute significantly to AI-driven projects (Anshari *et al.,* 2025). Bearing that in mind, these stakeholders should be able to adapt to the ever-changing business conditions brought about by ubiquitous AI-powered technologies and innovations, while considering the ethical implications of technological advancements and the AI governance framework.

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It is corroborated that despite the progress made in emerging economies like Africa concerning AI development and execution, the continent is still plagued by a scarcity of policies governing AI initiatives (Diallo *et al.,* 2025; Henk & Henk, 2025).

5.3 Policies and strategies regulating AI and other emerging digital technologies in the South African public sector

As Barodi and Lalaoui (2025:65) cited, "AI implementation in government requires robust data governance and well-aligned organisational strategies". As AI-based technologies continue to advance in the African public sector, there is an increasing demand for AI policies and regulations to ensure their responsible application, while considering and addressing the ethical challenges of data privacy, security, and public trust (Alaran *et al.,* 2025). For instance, notwithstanding the significant strides made in adopting emerging digital technologies (including AI), like many other African countries, South Africa, as an emerging country, is faced with the lack of policies governing AI. More notably, even though an endeavour has been made to develop a digital policy referred to as the Draft Digital Government Policy Framework (DGPF) aiming to guide the government administrative operations and the use of digital technologies in South Africa, the policy is still yet to be approved and endorsed by the parliament (Department of Public Service and Administration (DPSA, 2024). With the growing expectations to achieve the National Development Plan's SDGs and Vision 2030, the South African government's enactment of a sound digital policy for governing AI and other digital technologies cannot be overstated (DCDT, 2020a).

It is opined that while the country has established digital transformation policies to navigate the integration of emerging digital technologies (including AI), they do not adequately provide for the management and improvement of their application (DPSA, 2024). Despite this, the president of the country, Cyril Ramaphosa, established the Presidential Commission for the Fourth Industrial Revolution (PC4IR) in 2018 to revolutionise the country's capacity to leverage the adoption of 4IR technologies in the rapidly changing business context (DCDT, 2020b). However, whereas the government is currently confronted with persistent socio-economic disparities, also known as the triple scourge (poverty, inequality and high unemployment rate), embracing AI technologies in the 21st Century necessitates a customised digital policy that addresses these concerns to enhance service delivery to the public.

South Africa has noticed diverse AI initiatives across the country stemming from a collaboration with a multitude of stakeholders, such as government agencies, private industries, HEIs, international alliances, and the public. To accelerate AI development and prepare for emerging digital technologies, the South African government, through the DCDT,

introduced "South Africa's artificial intelligence planning" (DCDT, 2023). The primary aim of the document is to develop the country's strategy or plan for integrating AI-related technologies into national priorities and the SDGs' strategic goals, thereby realising the NDP 2030 in the digital realm. Apart from the development of the country's conceptual model, the AI plan intends to establish an AI governance and regulatory framework while, at the same time, delineating the following (DCDT, 2023:2):

- "A set of positive goals for what South African society requires from AI,

- Management of negative AI impacts on society and industry,

- Building an understanding of the AI technological possibilities, and

- Proving certainty to society on this rapidly evolving AI technology through flexibility and accommodation of skills, software, innovations, and applications."

Table 4 presents a synopsis of the policies and strategies developed or still under development by the South African government for AI and other emerging digital technologies. The policies and strategies are reflected in Table 4.

Table 4: A synopsis of policies and strategies for emerging digital technologies in South Africa

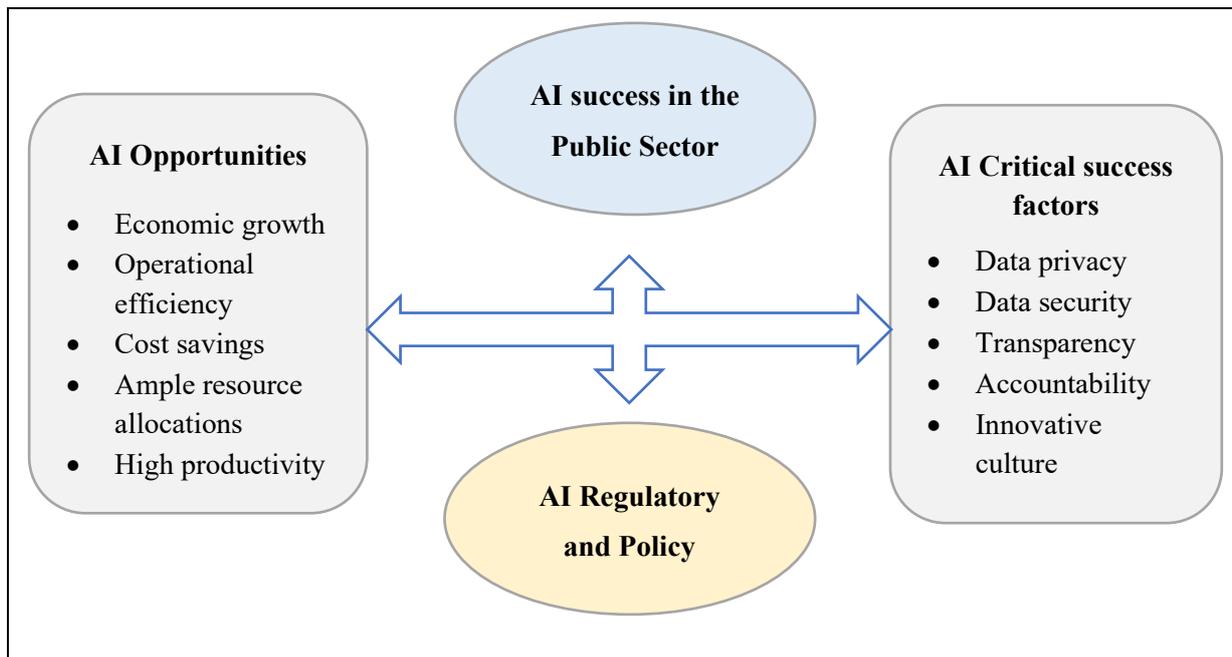| Policy/strategy	Department	Year
Terms of reference of the Presidential Commission on the 4th Industrial Revolution	DTPS	2018
National Digital and Future Skills Strategy	DCDT	2020a
Summary report and recommendations: Commission on the Fourth Industrial Revolution	DCDT	2020b
Implementation guide for the national digital and future skills strategy 2021-2025	DCDT	2021
South Africa's Artificial Intelligence (AI) Planning	DCDT	2023
Draft Digital Government Policy Framework	DPSA	2024
National Policy on Data and Cloud	DCDT	2024a
South Africa's Communication and Digital Technology Infrastructure Roadmap, 28-31 October 2024	DCDT	2024b
South Africa's National Artificial Intelligence Policy Framework	DCDT	2024c

Globally, with the increasing need to redesign service delivery models and integrate pervasive digital technologies, the South African government has endorsed the "National Data and Cloud Policy Framework" (DCDT, 2024a). The policy's key objective is to manage the government's

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voluminous data through trailblazing digital technology such as cloud computing. Furthermore, among other objectives, the policy framework aims to enhance service delivery by fostering socio-economic growth and promoting automated, data-driven decision-making processes to thrive in the digital era (DCDT, 2024a). Most notably, the policy emphasises the importance of extensive training, capacitation, and skill development, including that of the State Information Technology Agency (SITA), to promote the adoption of cloud computing and ensure a successful transition to efficient data management practices across various industries nationwide. By adopting a cloud computing policy and strategy, the South African government aims to establish an effective data management process that prioritises data security and privacy, while promoting innovative and efficient public administration.

Additionally, apart from the AI planning emphasised above, the government has also introduced the "South Africa National Artificial Intelligence Policy Framework" in August 2024, which aims to harness the assimilation of AI-related technologies in various sectors (including the public management) to boost the economy, meanwhile improving the well-being of the citizens and positioning itself at the forefront of the AI innovation (DCDT, 2024c). For example, in the current decade, AI has made swift progress in the country, leading to the identification of a general-purpose technology (GPT). The framework highlights the country's dedication to ethical AI development and application, alongside the establishment of data governance structures that take into cognisance issues of data privacy and security as well as cybersecurity, while ensuring the enhancement of AI accountability and transparency to nurture public trust (DCDT, 2024c). Moreover, aside from promoting collaboration with the private sector, the framework aims to address the scarcity of digital competencies among users of AI technologies, which is regarded as a pressing issue on the African continent (Barodi & Lalaoui, 2025; Diallo *et al.,* 2025). Most imperatively, this policy framework serves as a blueprint and keystone for the development of AI regulations and possibly the endorsement of the AI Act in the South African context (DCDT, 2024c).

In summary, although AI technologies in the public sector may appear to lag behind those in the private sector, the South African government has taken drastic steps to develop AI policies and regulations to guide the operation of AI initiatives. With that said, the public sector is not immune to the full adoption of AI technologies in enhancing public administration to survive in the digital era and, at the same time, progress towards achieving the SDGs. Based on the findings, this study proposes a conceptual model linking AI success in public sector management to opportunities, critical success factors, and the regulatory and policy framework.

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Figure 2: Conceptual model linking AI success in the public sector

6. MANAGERIAL IMPLICATIONS

Bearing in mind that South Africa is not exempt from achieving the NDP's SDGs Vision and Trajectory 2030, the study provides crucial insights and guidelines for policymakers, practitioners, and decision-makers as a baseline for considering AI adoption and management in the public sector in South Africa and other emerging economies with similar settings. Specifically, the study can also help with policy formulation by integrating AI adoption's most indispensable critical success factors (e.g., ethical issues – privacy, security, accountability, transparency, and fairness). These are fundamental in increasing the usage and access to various emerging digital technologies, as users will feel more secure. Furthermore, the study's in-depth analysis of digital policies and strategies guiding AI and other emerging digital technologies in South Africa can enable the country to navigate and leverage policy formulation and implementation to thrive in the current digital age.

The findings obtained in this study also have significant practical implications for public sector organisations in South Africa. These are elucidated in terms of the adopted theoretical underpinning of this study (i.e., the TOE contextual factors): technology, organisation and environment. The consideration of these contextual factors can provide a novel lens for public managers when tackling the probabilities presented by AI-driven technologies related to organisational changes. At the same time, these factors can help measure organisational capability and further enhance the development and implementation of AI policy in the public sector. For example, while the technological context can enable public managers to identify

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relevant digital technology appropriate in the digital era, the organisational context can enhance the organisation's capacity assessment. Additionally, the environmental context can facilitate compliance with applicable laws and regulations relating to technologies. Furthermore, the study findings can aid in evaluating the efficacy of specific digital policies, as emerging digital technologies (e.g., AI, cloud computing, big data) are prone to ethical vulnerabilities.

7. CONCLUSIONS AND RECOMMENDATIONS

This study critically reviewed the key enablers and constraints of AI adoption to improve management practices in the South African public sector milieu. Grounded in the Tornatzky and Fleischer (1990) TOE framework, the study explored the opportunities and threats generated by AI-powered technologies, while also detecting ethical challenges linked to the adoption of such AI in the public sector. Notably, this study contributes to the body of knowledge by identifying and critically evaluating the enablers and constraints prevalent in AI adoption, thereby enhancing management practices as discussed in academic discourse. Furthermore, the study sheds light on the *status quo* of policies and strategies (i.e., regulatory frameworks) that are significant for governing and improving AI adoption and other emerging digital technologies (e.g., cloud computing, big data, virtual platforms, and the Internet of Things) in the South African context.

It is recommended that South Africa take advantage of the benefits and opportunities brought by AI technologies whilst neutralising their threats and challenges. Again, investment in training and professional development of public servants and other users is key to the realisation of AI-driven initiatives in the country. Moreover, issues pertaining to data privacy and security should be heightened through sound legal and regulatory frameworks to circumvent unnecessary data breaches while enhancing citizens' trust. Fostering an innovative or digital organisational culture in the public sector management can improve the decision-making process and management practices, leading to enhanced organisational performance and the realisation of long-term objectives. Lastly, ring-fencing funding for AI technologies (i.e., reprioritising budget allocation) and other related digital initiatives is crucial to ensure practical success (DCDT, 2023; DCDT, 2024c).

Since the study has developed a conceptual model for AI adoption through a critical review of the literature on AI in the public sector, future studies can employ quantitative methodologies to formulate hypotheses, thereby creating an environment and a framework for testing and validating the model. This can help in generalising the research findings when considering a larger sample. On the other hand, qualitative research can be regarded as gathering rich data

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from participants through in-depth interviews, case studies, and focus group designs. These research designs can enable researchers to gain insight and a deeper understanding of AI in the public sector within the digital domain.

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