UNLOCKING THE POTENTIAL: EXPLORING THE INFLUENCE OF ARTIFICIAL INTELLIGENCE ON E-HEALTH ENHANCEMENT IN SOUTH AFRICA

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ABSTRACT

The study titled "Unlocking the Potential: Examining the Impact of Artificial Intelligence on Improving E-Health in South Africa" examines how artificial intelligence (AI) can help solve the substantial inequalities in healthcare access and quality in South Africa. Despite persistent actions to enhance healthcare services, a significant disparity persists, especially in remote and disadvantaged areas. This study seeks to investigate the ways in which AI can improve e-health services, with a specific focus on its ability to address the healthcare gap and enhance results throughout the entire country.

The study utilizes a qualitative approach, examining pre-existing literature, policy papers, and expert viewpoints to clarify the influence of AI on the provision of healthcare. The results emphasize that AI technologies, such as Virtual Health Assistants (VHAs) and remote monitoring systems, can greatly reduce the workload on public healthcare institutions, improve the management of chronic diseases, and automate administrative duties. Through the optimization of these processes, artificial intelligence (AI) has the potential to allocate more time for healthcare workers to prioritize patient care.

Furthermore, the article highlights the need of tackling obstacles such as concerns around the protection of data and the requirement for strong digital infrastructure to facilitate the deployment of AI. Suggested measures involve allocating resources towards customized artificial intelligence solutions, improving the training of healthcare professionals, and promoting cooperation among relevant parties to develop efficient electronic health initiatives. In conclusion, the article highlights the capacity of AI to transform healthcare in South Africa, by ensuring fair availability of high-quality treatments and enhancing health results for the entire population. Through addressing current barriers and harnessing the potential of artificial intelligence, South Africa has the potential to make substantial progress in attaining universal healthcare coverage and guaranteeing universal access to vital healthcare services.

Keywords: Artificial Intelligence, E-Health, Alternative Service Delivery, South Africa.

1. INTRODUCTION

The healthcare system in South Africa has been hampered by a variety of difficulties and challenges over the past couple of years. Some of these challenges include financial difficulties, shortage of staff, weak leadership, poor coordination of policy, poor information management and inadequate use and utilisation of information communication technologies (Malakoane, Heunis, Chikobvu, Kigozi and Kruger, 2020; Horwood., Luthuli, Mapumulo, Haskins, Jensen, Pansegrouw and McKerrow, 2023). To add on to this is the disparities that exist between rural and urban healthcare in the country. Urban areas are characterised by having better healthcare infrastructure, more clinics and hospitals and more health personnel. This is a direct contrast to rural areas that have lesser health professionals in hospitals and clinics that are limited in number and have poor infrastructure (Mthembu, 2024). Another issue that affects rural areas is the distance that people must travel to access healthcare facilities (Vergunst, Swartz, Hem, Eide, Mannan, MacLachlan, Mji, Braathen, and Schneider, 2017). This has also been highlighted by a study conducted by Richards, le Roux and Pienaar (2024), which shows that the cumulative distance to travel to rural area hospitals or healthcare facilities is almost 3-4 times greater than the cumulative distance required to travel in urban areas. Additionally, healthcare issues in both rural and urban areas have been further perpetuated by historical apartheid legacies, ongoing disparities, and

corruption in post-apartheid regimes (Niyitunga, 2022). The delivery and provision of healthcare is a human right. hence, any failure constitutes human rights violation that needs to be addressed.

2. METHODOLOGY

For this paper, the type of methodology that was utilised is qualitative. It was used to answer the main research question through collecting and analysing secondary data. Qualitative research is inductive in nature and in the context of the article the meaning and insights of central to the research question were investigated (Strauss and Corbin, 2008; Levitt et al., 2017). The study primarily focuses of this on looking at the benefits that ai can bring in improving e-health services and the overall health system in South Africa. In line to this, the main objective of qualitative research is to generate meaning from the perceptions of people through written work, observations and visuals, this data is in-turn analysed and interpreted to generate valuable insights (Maxwell, 2013). The type of literature sources that was used for this paper included books, journal articles, internet sources and occasional papers. Moreover, the documents selected for analysis were obtained from reputable academic databases, governmental organizations, research institutions, and industry reports. The type of data analysis that is used in this article is documentary analysis which entails the systematic analysis of existing data in the form of documents and other written materials relevant to healthcare in South Africa, e-health and ai (Braun and Clark, 2006).

The collected documents were analysed by identifying key themes, trends and insights related to the South African health system, e-health and ai. This process involved categorising and summarising the information to generate valuable insights by extracting relevant findings (Braun and Clark, 2006). In recognising the constraints and limitations that come with documentary analysis, such as the credibility, dependability and accessibility of the documents, attempts were made to incorporate a wide range of secondary sources to limit the biases and to carefully assess the reliability of the documents analysed. Throughout the compilation of the article, ethical considerations were important. This encompassed ensuring the precision and reliability of the data. The act of accurately citing and acknowledging sources was maintained to maintain academic honesty and ensure transparency.

3. LITERATURE REVIEW

The literature on the potential of ai through e-health in combating the challenges faced by the health system in South Africa covers different viewpoints and perspectives. Academics and experts in the field of healthcare, e-health and ai have valuable observations regarding the main research focus of the article. This section aims to integrate those viewpoints and perspectives to generate key insights aligned to the objective of the article.

3.1 Current landscape of the healthcare system in South Africa

The South African healthcare system is categorised into two main components which is private and public healthcare (Gordon, Booysen, and Mbonigaba, 2020). Public healthcare in South Africa caters for most of the population. The services that are offered by public healthcare are funded through the tax revenue within the country (Gordon et al., 2020). The main reason behind this is because public healthcare is freely available to most people who cannot afford private healthcare (Pillay, Museriri, Barron and Zondi, 2023; Siddiq, Aftab, Raman, Soucat and Alwan, 2023; Gordon et al., 2020). Due to this public healthcare facilities in South Africa are categorized by issues such as overcrowding and inadequate resources leading to long waiting hours and inefficient quality of care (Malakoane, Heunis, Chikobvu, Kigozi and Kruger, 2020; Gordon et al., 2020). In contrast to public healthcare, private healthcare is only available to the minority of people in the country that can afford private healthcare insurance or out of payment pockets (Burger and Christian, 2020). Unlike public healthcare facilities, private healthcare facilities in South Africa are categorised by high levels of quality care,

which offers more personalized attention, advanced medical technologies, and more capacity to offer a broader variety of services. Patients have shorter waiting times and shorter hospital stays (Mhlanga and Garidzirai, 2020; Ngobeni, Breitenbach and Aye, 2020). According to the Presidential Health Summit Report (2018), 83 percent of the population in South Africa rely on public healthcare while 17 percent have access to private insurance.

The major contrast between private and public healthcare in South Africa is concern because it exacerbates already existing inequalities in the access of essential services in South Africa. On the other hand, funding public healthcare in South Africa has been difficult because out of the population only a small minority contribute towards tax, and this has created difficulties because tax is used to fund essential public services in the country (Doherty, 2014). For instance, statistics show that despite the country having a population of 60 million only 6.4 million filled for tax returns in 2021, this had a major impact on the revenue available for the government to use on essential services such as health (South African Revenue Services, 2023). Another example is that in 2023 over 1000 doctors were unemployed due to issues related to budget constraints, this is despite for the need for more health professionals (South African Revenue Services, 2023). Additionally, corruption scandals within public healthcare have further put a strain on the limited resources that the healthcare system depends on. This can be depicted from the PPE scandals during the Covid 19 pandemic were money meant for Covid 19 relief initiatives went missing through tenders awarded to companies that were not reputable (South African Revenue Services, 2023). Generally, corruption has been a major concern for public service in South Africa.

3.2 E-health and Artificial intelligence in healthcare delivery

The term "electronic health" (e-Health) was initially coined in the 1990s to describe the rapid growth of Internet-based healthcare services. Initially, the term was employed by marketing strategists and industry leaders, rather than health experts and academicians, in parallel with other "e-words" like e-business and e-commerce. Eysenbach initially coined the term as a field that combines medical informatics, public health, and business. It pertains to the delivery or improvement of health services and information through the Internet and similar technologies (Eysenbach, 2001). E-health is the utilization of information and communication technology for the purpose of promoting health, as defined by the World Health Organization (WHO) (WHO, 2014). Amidst the COVID-19 pandemic, e-health services played a vital role in upholding healthcare provision while avoiding personal interaction to mitigate the transmission of the virus. The global implementation of telemedicine, remote patient monitoring, and digital health applications was expedited by the epidemic (Yudkin, Messiah, Allicock, and Barlow, 2024; Marsilio, Calcaterra, Infante, Pisarra and Zuccotti, 2024). The integration of E-health and Artificial Intelligence (AI) is directly associated with the transformation of healthcare delivery, enhancement of patient care, and optimization of medical education (Sharma, 2024).

In this dynamic period of the Fourth Industrial Revolution (4IR), the introduction of Artificial Intelligence (AI) serves as an indicator for organizations all over the world to undergo transformation (Okunlaya, Syed Abdullah, and Alias, 2022; Ally and Wark, 2020). Artificial Intelligence (AI) refers to computer programs that are capable of learning, planning, and solving problems in a manner like that of humans. Computer science is a multifaceted discipline that centres on the development of intelligent machines that can perform duties that are conventionally associated with human intelligence (Brynjolfsson and Mitchell, 2017). Artificial Intelligence (AI) encompasses a multitude of academic fields, such as hardware and software engineering, linguistics, neuroscience, philosophy, psychology, and computer science, among others (Sadiku, Musa and Chukwu, 2022). Artificial intelligence (AI) is currently being adopted in the public sector. The recent progress in this domain and the rapid growth of AI in the corporate sector have contributed to a significant transformation in government, public service management, accountability, and public welfare. The value.

Ongoing research is currently being conducted to comprehend, conceive, and articulate obstacles and constraints in their early stages (Valle-Cruz, Alejandro Ruvalcaba-Gomez, Sandoval-Almazan, and Ignacio Criado, 2019; Ahn and Chen, 2020). AI is gradually being introduced into the realm of e-health to improve certain aspect of health delivery (Shaikh, Alhashmi, Khalique, Khedr, Raahemifar and Bukhari, 2023). This includes areas such as treatment, patient management, administrative tasks and diagnostics (Shaikh, et al., 2023).

3.2.1 Areas in which AI is transforming e-health services

There are various areas in which AI has brought some changes in the way e-health services are delivered. Looking at the growing nature of the use of AI some of these discoveries are regarded by scholars as major advantages that healthcare systems can leverage (Hatamlah, 2024; Shaikh, et al, 2023; Valle-Cruz, 2020).

3.2.1.1 Virtual health assistants

Virtual Health Assistants (VHA) incorporates the use of chatbots and virtual assistance that are automated to provide 24-hour support which entails offering advice to patients, answering questions and performing initial diagnosis that considers the symptoms that a patient may be experiencing (Babarinde, Ayo-Farai, Maduka, Okongwu, Ogundairo and Sodamade, 2023). For instance, in South Africa the National Department of Health introduced the Covid 19 support line which used an AI chatbot to answer questions related to symptoms of the virus, testing sites and public inquiries related to the pandemic (Department of Health. 2023). Looking at the potential that VHA has it can enhance the healthcare system in South Africa by offering preliminary diagnosis of patients, 24 hours supporting and triaging patients, this can assist with eradicating issues such as overcrowding in health facilities (Maher, Singh, Wylde, and Chastin, 2024). Moreover, VHAs can assist healthcare workers with collecting patient data and handling complex administrative tasks allowing health workers to focus on providing healthcare (Maher et al., 2024). Additionally, the way VHAs are scalable it makes them cost effective; this can be helpful in rural areas where access will result in less patients traveling long distances to access medical facilities (Babarinde et al, 2023). However, the successful adoption of such advances requires adequate digital infrastructure, training of health workers and effective data privacy measurements (Babarinde et al, 2023).

3.2.1.1 Remote monitoring and telemedicine

Remote monitoring and telemedicine are one of the key benefits of AI, this is because AI platforms can monitor patients remotely, analysing data on wearable devices and in turn informing health professionals to issues in real-time. This can be helpful in monitoring and managing chronic diseases and limiting the need for frequent visits to health facilities, the adoption of AI-platforms for remote patient monitoring could meaningfully improve healthcare delivery, particularly in handling chronic diseases which are predominant (Maher et al., 2024; Babarinde et al, 2023). Furthermore, the challenge regarding inadequate health infrastructure and high burden on public health services can be mitigated and AI in remote monitoring can remove the immense pressure that hospitals and clinics are facing. This will lead to effective means of managing patients particularly those with chronic diseases (Maher et al., 2024; Babarinde et al, 2023). AI can forecast patient results by examining historical health data. For instance, it can predict the probability of hospital readmissions, which improves proper management of hospital resources and patient care plans (Maher et al., 2024; Babarinde et al, 2023). Moreover, artificial intelligence has the capability to automate mundane administrative duties, including the organization of appointments, maintenance of patient information, and handling of insurance claims. This minimizes the administrative workload on healthcare personnel and enables them to prioritize patient care (Maher et al., 2024; Babarinde et al, 2023).

3.2.2 Challenges associated with the adoption of AI driven e-health initiatives in South Africa

Although AI driven solutions offer numerous benefits, particularly in the efficiency of the delivery of essential services such as healthcare, the conditions in which such interventions are implemented may lead to the failure or success of these initiatives leading to success (Govender et at., 2023). South Africa is categorised by issues such as inequality which emanate from past legacies and disparities coupled with current challenges which may affect the success of innovative ideas (Govender et at., 2023).

3.2.2.1 Digital Divide

According to a study published by Govender, Ramlutchman, and Reddy (2023), during the COVID-19 pandemic the digital divide in the country severely affected the distribution of the COVID 19 vaccine information. This was apparent more in women and senior citizens who found it hard to access and utilise digital platforms due to a lack of digital literacy or access to information communication devices (Govender et at., 2023). Because of this disparity in access to digital resources, these specific demographic groups received information on vaccination that was less prompt and precise, hence worsening the already existing discrepancies in health outcomes (Govender et al., 2023). Bon, Saa-Dittoh and Akkermans (2024), also state that in South Africa rural areas and disadvantaged communities face the main limitation of information communication technologies such as smartphones, computers and general access to the internet. Additionally, the issue of network coverage and connectivity is still an issue in rural areas, in turn this disturbs the implementation of remote services that rely on information communication technologies and internet access and availability (Donati, 2023; Lembani, Gunter, Breines and Dalu, 2020; Mbunge, Batani, Gaobotse and Muchemwa, 2022).

Another issue that has had a direct impact on digital divide is the economic disparities in the country as the level of unemployment is high, this implies that people from lower-income households may not be able to afford the technology and data needed to access e-health services (Werthner, Ghezzi, Kramer, Nida-Rümelin, Nuseibeh, Prem and Stanger, 2024). The above shows that implementing AI driven initiatives in South Africa will not be easy considering the adverse nature of challenges that the country faces. Although there are advantages that the health system in South Africa can benefit from the adoption of AI related solutions the challenges mentioned offer a significant hurdle that will require a strategic approach for such initiatives to have the intended impact.

3.2.2.2 Data privacy issues

The utilization of AI solutions in South Africa gives rise to many data privacy concerns, principally stemming from the gathering, retention, and manipulation of substantial quantities of sensitive personal data. The Protection of Personal Information Act (POPIA) imposes stringent regulations on the management of personal data, which can be difficult to adhere to due to the complex nature of AI technology. Concerns arise over the possibility of data breaches, illegal access, and the improper use of personal health information, which can result in substantial harm if sensitive data is disclosed. Furthermore, there is a potential danger of insufficient data anonymization, in which artificial intelligence systems can unintentionally identify persons from datasets that have been anonymized. The general population's lack of digital literacy and awareness worsens these dangers, as individuals may not have a complete understanding of their data rights or the consequences of sharing personal information with AI systems. To avoid these risks and establish public trust in AI solutions, it is crucial to implement strong cybersecurity measures, establish clear legislative frameworks, and provide extensive education on data protection (Dilmaghani, Brust, Danoy, Cassagnes, Pecero, and Bouvry,, 2019,; Stahl and Wright, 2018).

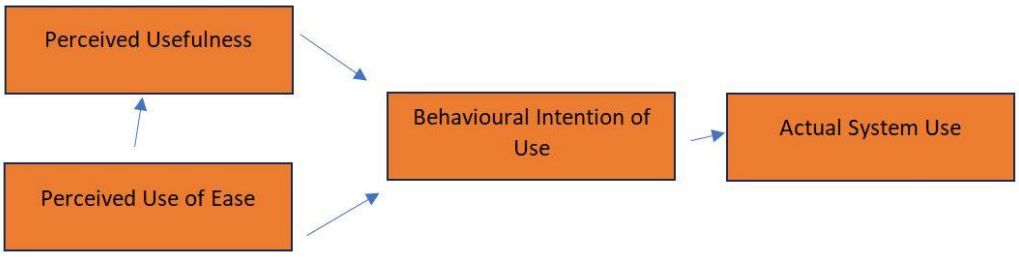
3.3 Best practises of leveraging AI for healthcare delivery in developing countries

India and other countries have effectively employed mobile health (mHealth) applications to reach communities with limited access to healthcare. They have achieved this by creating mobile platforms that are easy to use and provide health information and services. This technique has greatly enhanced the availability of healthcare, particularly in remote regions, and offers a feasible plan for South Africa to expand the coverage of its e-health services (Ahamed, Palepu, Dubey and Nongkynrih, 2017).In Bangladesh, community health workers (CHWs) are trained to apply AI technologies for data collecting and patient monitoring (Stanton, Molineux, Mackenzie and Kelly-Hope, 2016). This training helps to connect technology with local communities, ensuring that AI solutions are effectively used and culturally appropriate. Incorporating Community Health Workers (CHWs) into South Africa's healthcare system has the potential to yield comparable outcomes. The collaboration between public and commercial sectors has played a crucial role in the achievements of e-health projects in nations such as Kenya (Boore, James and Iraki, 2017). The partnerships between the government and private technology businesses have enabled the creation of cutting-edge artificial intelligence solutions that are in line with public health objectives. South Africa can gain advantages by cultivating comparable collaborations to improve its e-health environment. Furthermore, in Brazil, artificial intelligence (AI) solutions in the healthcare sector have been customized to specifically tackle local health concerns, such as endemic diseases.

Through comprehensive needs assessments and active involvement of local stakeholders, South Africa can create artificial intelligence (AI) solutions that are pertinent and efficient in tackling its own healthcare obstacles (Boore, James and Iraki, 2017). Investing in capacity building and education is essential, as demonstrated in Rwanda, where healthcare personnel receive training in digital health technologies. Implementing training initiatives centered around artificial intelligence (AI) and digital health has the potential to enhance the capabilities of healthcare professionals in South Africa, leading to improved service provision (Uwaliraye, Ndimubanzi, Muhire and Lyle 2019). In addition, Ethiopia has utilized artificial intelligence (AI) for data analysis, resulting in enhanced health service delivery by optimizing resource allocation and planning. Utilizing comparable data-driven methodologies can improve decision-making processes in healthcare administration in South Africa. Developing explicit legal frameworks, like to those implemented in Malaysia, is crucial for ensuring the secure and efficient utilization of AI. These frameworks are particularly important for addressing ethical issues and safeguarding data privacy. Ultimately, involving communities in the development and execution of AI solutions, as exemplified in the Philippines, guarantees that these technologies align with the real requirements of the population, promoting increased acceptability and utilization (Manyazewal, Woldeamanuel, Blumberg, Fekadu and Marconi, 2021; Sithambaram and Tajudeen, 2023; Shariff., and Chandran, 2024).

4. THEORITICAL FRAMEWORK

The Technology Acceptance Model (TAM) offers a structure for examining the implementation of AI-driven e-health efforts in South Africa, focusing on two key factors: Perceived Usefulness (PU) and Perceived Ease of Use (PEOU). Within the distinctive healthcare environment of South Africa, these elements provide valuable insights.



Source: Naeini and Krishnam (2012)

FIGURE 1
THE TECHNOLOGY ACCEPTANCE MODEL (TAM)

The figure above shows components of the TAMs model and how the parts are interrelated. The Technology Acceptance Model (TAM) is a modified version of the Theory of Reasoned Action (TRA) specifically designed for the field of Information Systems (IS). TAM suggests that an individual's intention to utilize a system can be determined by their perception of the system's usefulness and ease of use. TRA and TAM assume that individuals, upon setting an objective, will have the freedom to carry it out without any limitations or constraints. Various constraints, such as restricted expertise, time constraints, environmental or organizational limitations, and ingrained behaviours, can restrict the freedom to act (Naeini and Krishnam, 2012).

4.1 Perceived Usefulness (PU)

The prevalence of AI-driven e-health projects in South Africa is substantial, primarily influenced by multiple reasons. AI solutions such as Virtual Health Assistants (VHAs) and remote monitoring systems improve healthcare delivery by alleviating overcrowding in public facilities and enhancing chronic illness management using real-time data and predictive analytics. This is especially advantageous in a nation where public healthcare institutions frequently face the challenges of being overburdened and lacking sufficient resources (Shaikh et al., 2023). Furthermore, the potential of AI to automate administrative duties, such as scheduling and data administration, lessens the burden on healthcare workers, enabling them to allocate more attention to patient care (Valle-Cruz et al., 2019). AI-powered e-health services play a vital role in granting essential healthcare access to rural and underprivileged regions by tackling major obstacles like as long travel distances and limited local healthcare resources (Bon et al., 2024).

4.2 Perceived Ease of Use (PEOU)

Another crucial element in the implementation of AI-powered e-health projects is. The usability of AI applications, such as Virtual Health Assistants (VHAs) and telemedicine platforms, is crucial in promoting their acceptance, particularly among individuals with limited proficiency in using digital technology. Efficient interfaces and explicit instructions are essential in this context (Govender et al., 2023). Moreover, it is crucial to offer sufficient training and support to healthcare professionals and individuals utilizing healthcare services. Training programs can mitigate initial reluctance and foster trust in the utilization of novel technologies (Babarinde et al., 2023). Furthermore, it is imperative to have a strong and reliable digital framework and internet access, specifically in rural regions, to guarantee the efficient functioning of AI-powered e-health services. Addressing these infrastructural obstacles might greatly enhance the perceived user-friendliness (Donati, 2023).

4.3 External Factors Influencing TAM Components

Encompassed therein are economic inequalities, legal and data privacy issues, and cultural and social elements. Economic inequalities, such as the exorbitant expenses associated with technology and internet connectivity, can impede the perceived convenience and effectiveness of AI-powered e-health services. To overcome these obstacles, it is imperative to implement policies that provide financial support for technology expenses and enhance the availability of internet connection (Werthner et al., 2024). Regulatory and data privacy concerns are also highly influential. The rigorous criteria set forth by the Protection of Personal Information Act (POPIA) and concerns around data privacy can have an influence on the perceived effectiveness and user-friendliness of AI technology. Adhering to legislation and adopting robust data protection procedures are essential for establishing user confidence and approval (South African Revenue Services, 2023). Finally, the adoption of AI technologies is influenced by cultural and societal aspects, including social acceptance that is shaped by cultural views towards technology and privacy. Public awareness campaigns and community engagement programs can mitigate cultural resistance and advocate for the advantages of AI in healthcare (Mbunge et al., 2022). By utilizing the Technology Acceptance Model, stakeholders can gain a deeper comprehension of the elements that impact the adoption of AI-driven e-health efforts in South Africa. This comprehension can guide approaches to augment their reception and efficacy, ultimately enhancing healthcare provision throughout the nation.

5. FINDINGS AND DICUSSIONS

The article "Unlocking the Potential: Exploring the Influence of Artificial Intelligence on E-Health Enhancement in South Africa" presents the major findings, including the outcomes of the theoretical framework, in a table format.

Table 1. Key findings

Finding	Description
Challenges in Healthcare System	The South African healthcare system is confronted with financial constraints, a scarcity of personnel, ineffective management, insufficient policy integration, and inadequate utilization of information communication technologies.
Urban vs. Rural Disparities	Significant disparities exist between urban and rural healthcare, with urban areas having better infrastructure and more health personnel compared to rural areas, which suffer from limited access and resources.
Impact of Historical Factors	The enduring effects of historical apartheid policies and persisting inequalities are major factors that contribute to the present difficulties in providing healthcare, which in turn impact the accessibility and quality of services.
Role of Artificial Intelligence (AI)	Artificial intelligence (AI) has the capacity to enhance electronic health (e-health) services by optimizing data management, enhancing patient care, and increasing operational efficiency within the healthcare system.
Theoretical Framework:	The study employs the Technology Acceptance Model (TAM) to

Technology Acceptance Model (TAM)	analyse the adoption of AI-driven e-health initiatives, focusing on **Perceived Usefulness (PU)**: AI solutions improve healthcare delivery and reduce administrative burdens. On **Perceived Ease of Use (PEOU)**: User-friendly interfaces and adequate training are essential for acceptance, especially among those with limited digital skills.

Source: Compiled by Author

The South African healthcare system encounters various obstacles, such as financial limitations, a scarcity of staff, inefficient administration, inadequate policy coordination, and insufficient utilization of information communication technologies (ICTs). Urban and rural healthcare exhibit considerable differences, with rural areas facing restricted access and resources in contrast to better-equipped urban districts. The issues are worsened by historical circumstances, specifically the enduring effects of apartheid and persistent disparities, which have a negative impact on the availability and standard of healthcare services. Nevertheless, the capacity of artificial intelligence (AI) to improve e-health services through the optimization of data management, enhancement of patient care, and augmentation of operational efficiency presents a hopeful solution. The study employs the Technology Acceptance Model (TAM) to evaluate the acceptance of AI-driven e-health efforts, highlighting the significance of perceived usefulness (PU) and perceived ease of use (PEOU) in achieving successful implementation, particularly for users with little digital proficiency.

6. RECOMMENDATIONS

Based on the literature and findings of the article the following recommendations are suggested to leverage the use of AI in e-health and healthcare delivery in South Africa.

- Investment in capacity building and education for healthcare staff in digital health technologies is necessary, as evidenced by successful programs in countries such as Rwanda.
- Investment in capacity building and education for healthcare staff in digital health technologies is necessary, as evidenced by successful programs in countries such as Rwanda.
- Promote Collaboration: For the South African healthcare system to benefit from efficient AI solutions tailored to its specific requirements, it is imperative to foster alliances among the government, business sector, and local stakeholders.
- Emphasize E-Health Infrastructure: Enhancing the e-health infrastructure is crucial for facilitating the incorporation of AI technologies, thereby guaranteeing that both urban and rural regions reap the advantages of improved healthcare provision.

7. CONCLUDING REMARKS

The incorporation of artificial intelligence (AI) into e-health services offers a significant chance to tackle the complex difficulties encountered by the healthcare system in South Africa, leading to transformation. The significant differences in healthcare access between urban and rural areas, which are worsened by historical factors and inefficiencies in the system, highlight the pressing requirement for creative solutions. Artificial intelligence (AI) technology, such as Virtual Health Assistants (VHAs) and remote monitoring systems, can greatly improve healthcare delivery by simplifying administrative tasks, increasing the accuracy of diagnoses, and providing medical consultations in places with limited access to healthcare. Nevertheless, the achievement of AI integration in healthcare relies on surmounting various challenges, such as addressing data privacy apprehensions, establishing comprehensive regulatory frameworks, and adequately teaching healthcare workers to proficiently utilize these technologies. The results of this study emphasize the significance of a holistic

strategy that not only integrates AI technologies but also tackles the fundamental systemic problems inside the healthcare infrastructure.

Moreover, the utilization of the Technology Acceptance Model (TAM) offers important understanding of the elements that influence the acceptance of AI-driven e-health efforts. By prioritizing the assessment of perceived usefulness and simplicity of use, stakeholders can gain a clearer understanding of how to promote the acceptability of these technologies among both healthcare providers and patients. Ultimately, the potential advantages of AI in improving e-health services in South Africa are encouraging. However, it is imperative that a cooperative endeavour involving policymakers, healthcare professionals, and communities takes place to guarantee the successful integration of these technologies into the healthcare system. By using this approach, South Africa can progress towards a healthcare system that is fair and effective, ultimately enhancing health results for all individuals. Integrating artificial intelligence (AI) into e-health offers a possible answer to the various issues encountered by South Africa's healthcare system. The glaring discrepancies between the public and private healthcare systems, worsened by concerns such as congestion, resource shortages, and corruption, emphasize the pressing need for innovative alternatives.

AI-powered technologies such as Virtual Health Assistants (VHAs) and remote monitoring systems have the potential to greatly improve healthcare delivery by reducing the strain on public facilities, enhancing the management of chronic diseases, and automating administrative duties. Nevertheless, the achievement of successful implementation encounters significant obstacles, such as the disparity in access to digital technology, economic inequalities, and apprehensions regarding the protection of data privacy. To tackle these difficulties, it is necessary to have a strong and reliable digital infrastructure, provide extensive training for healthcare professionals, and implement strict procedures to protect data. The Technology Acceptance Model (TAM) emphasizes the significance of perceived usefulness and ease of use in the acceptance of AI technologies. It suggests that strategic approaches that prioritize these variables might help enable the successful integration of AI in South Africa's healthcare system. In the end, the success of AI-driven e-health relies on effectively addressing these complex difficulties by concerted endeavours and strategic preparation.

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