Journal of Public Administration, Policy and Governance Research (JPAPGR), Vol. 1, No. 2, June, 2023.
Available online at https://jpapgr.com/index.php/research. ISSN:2787-0464. Covered in google scholar, etc.
Agba, M.S., Agba, G. E. M. & Obeten, A. W., 2023, 1(2):1-14

Artificial Intelligence and Public Management and Governance in Developed and Developing Market Economies

Agba, Michael Sunday, PhD
Department of Public Administration, Faculty of Management Sciences
University of Calabar, Calabar, Nigeria
Email: mikagbaagba@yahoo.co.uk
ORCID: https://orcid.org/0000-0001-7907-1079

Grace Eleojo Michael Agba
National Health Insurance Scheme Unit
University of Calabar Teaching Hospital, Calabar, Nigeria
Email: graceelojom@gmail.com

Amos W. Obeten (Doctoral Student)
Department of Public Administration, Faculty of Management Sciences
University of Calabar, Calabar, Nigeria
Email: amosobeten60@gmail.com

Abstract

The objective of this paper is to examine the interplay between AI and public governance and management in developed and developing market economies. The technological revolution is fast changing the conduct of government business and work environment in the public and private sectors. In recent times we have seen the deployment of AI technologies to address the challenges of public governance and management. The paper therefore argues that AI has great potentials that have been deployed to boost government performance in the area of policymaking, social service delivery, public security management, public financial management, intergovernmental relations, politics, processing of information and data management. However, there are limitations associated with the use of AI in public management and governance. Integrating AI in government business requires competent hands vast in the knowledge and applications of AI technologies. Secondly, investing in the field of AI is expensive requiring huge capital that only be made available by strong political will and support. The paper concludes that there are great potentials yet to be explored in the interplay between AI and Public Administration. And because of the attractive returns in investment that AI offers, more researches should be conducted and greater support provided to experts and professionals who are interested in integrating AI to more functional areas of public management and governance.

Keywords: *Artificial Intelligence, Public Management, Governance, technological revolutions and investment.*

1. Introduction

The study and application of artificial intelligence and robotics in the public and private sector is generating global interest among scholars and practitioners. This is because the world of work is fast changing with an emerging new normal that calls for the integration of information and communication technology in workplaces and public governance. The tech world has revolutionized the workplace putting compelling demand on businesses, governments and non-governmental organizations and individuals to adjust to the emerging changes and challenges. Artificial Intelligence (AI) has become an essential tool in public management and governance across the

globe. AI is an advanced technology that can process massive amounts of data, make predictions, and provide insights that can inform decision-making processes.

In both developed and developing market economies, governments are increasingly adopting AI in public management and governance to improve efficiency, transparency, and accountability. However, AI adoption also presents challenges, including ethical considerations, bias, data privacy and security concerns, and high costs. This paper provides a comprehensive review of the opportunities and challenges of AI in public management and governance in developed and developing market economies, and proposes recommendations for mitigating these challenges.

For the purpose of clarity, the paper is divided into thematic sections. The first section constitutes the introductory of the paper while the second part presents the methodology adopted in the discussion. In section three, attempt was made to clarify the two major concepts: artificial intelligence and public management and governance. Section four examined the various ways artificial intelligence has been deployed in public administration with specific focus on developed and developing countries. In the section five, the paper devoted time to present some case studies on how AI has been deployed in public management and governance in developed and developing market economies. In section six we discussed the limitations in the use of AI in Public Administration and attempt was made to draw conclusion and make recommendations in section seven of the paper.

2. Methodology

A qualitative research design was adopted in the paper and data were collected from secondary sources like journal articles, government publications and internet sources. The qualitative data generated via secondary sources were organized in thematic format for the purpose of clarity. A combination of content analysis and Multiple Perspective Approach (MPA) that is largely descriptive in nature was adopted in the paper to examine how artificial intelligence has been integrated in public management and governance. A critical analytical approach adopted in the paper facilitated the identification of the challenges associated with the adoption or deployment of AI in public governance and management.

3. Conceptual Clarifications

Artificial Intelligence (AI)

McCarthy, a renowned American computer scientist coined the term Artificial Intelligence (AI) in 1956 and described it as "the science and engineering of making intelligent machines like the intelligent computer programs" (Amaresh, 2020). Since then, the term has come to be associated with diverse meanings and interpretation. First, it refers to the theory and development of computer systems with the capacity to execute tasks (such as decision making, visual perception, speech recognition and translation between languages) demanding human intelligence (Oxford Dictionary cited in Lexology, 2017). Frankenfield (2022) describes AI as the simulation of human intelligence in machines that are designed to think/act like humans and imitate their actions. AI is also been used in relation to machines programmed to demonstrate qualities associated with a human mind such as learning, problem-solving, perception, reasoning, planning, control and prediction. In the context of public sector management and governance, AI refers to the deployment of computer systems programmed to perform government tasks requiring human intelligence and discernment.

Artificial Intelligence can also be described from three multiple levels: As an Intelligent Entity Created computer experts and engineers; machines designed and programmed with the capacity of

carrying out tasks intelligently without being explicitly instructed and computer systems capable of thinking and acting rationally and humanely (Great Learning Team, 2023). There are three types of artificial intelligence, namely, Artificial Narrow Intelligence (ANI)- Artificial Intelligence systems programmed with the specialty to solve one single problem and can execute a single task accurately; Artificial General Intelligence (AGI)- a brand of Artificial Intelligence possessing the smartness of humans across board and Artificial Super Intelligence (ASI)-machine consciousness exhibiting the intellect that is much smarter than the best human brains in virtually every field (Great Learning Team, 2023).

Global Investments in Artificial Intelligence

Given the great prospects, potentials and socioeconomic impacts that lies in the design, development, sales and applications of Artificial Intelligence Systems (AISs) in business operations, and public governance, the field has attracted huge investments. Current global investment in AI technologies is estimated at 12.4 billion US Dollars (around £9.40 billion) and is projected that by 2025 investment in AI, machine learning and robotic process automation (RPA) technology will reach 232 billion USD (roughly £176 billion) (Outsight Insight, 2023). In June 2022, a Bloomberg report revealed that several governments, including the US, UK, China, and Canada, are significantly investing massively in AI. In 2020, the US government allocated over $1 billion for AI funding, and in March 2021, the Canadian government pledged more than half a billion dollars to bolster its AI initiatives (Sajid, 2023). China as a country is making plans to becoming a global and leading innovator in AI technologies with a total investment plan of 1 trillion yuan (estimated at $147.8 billion) by 2030 (Reis, Santo & Melao, 2019). The investment in AI technologies and innovations shows the growing importance of Artificial Intelligence in security management, manufacturing industries, transportation, marketing, decision making, public policy and governance, geography and weather prediction and forecasting, strategic management, business analytics, data analytics, management of urban data infrastructure, etc.

Public Management and Governance

Public management refers to the practices, techniques, and principles used in managing public sector organizations, including government agencies and non-profit organizations. Public management is also concerned with the methodologies for improving the effectiveness and efficiency of public services, ensuring accountability and transparency, and promoting the public interest. On the other hand, governance refers to the systems, structures, and processes used to manage and regulate the affairs of a society, organization, or group. Good governance is characterized by transparency, accountability, participation, and the rule of law. It is essential for ensuring that public resources are used efficiently, judiciously and effectively, and that public policies reflect the interests and aspirations of the wider community.

Public management and governance are closely intertwined, as effective public management requires good governance practices. The two fields share many common concerns, including improving the quality of public services, promoting ethical behavior, and ensuring the responsible use of public resources. Effective public management requires a range of skills, including strategic planning, financial management, human resource management, and performance measurement. Good governance practices include transparency, accountability, participation, and the rule of law.

Public governance is described as sum total of governmental activities directed at the making and enforcement of rules, production and delivery of publicly supported social goods and services (Fukuyama, 2013 & Lynn, Heinrich, & Hill, 2000). Public management and governance in developing market economies is basically concerned with the formulation and implementation of public policies and programmes, rendition of public services, maintenance of law and order, security of lives and property, regulation of the economy, establishment and maintenance of an effective health sector, educational sector, agricultural sector, disaster and emergency management, urban administration and infrastructural development. The concern of public management is to effectively and efficiently apply private sector/business management tools to improve the performance of public organisations.

In both developed and developing market economies, there is a drive for public sector reforms targeted at building trust in government and improving performance of public institutions in the services they render to the public. One of such reforms is the New Public Management Approach (NPMA). Primarily, the drive for restructuring public governance with a focus on public management was majorly a response to the obvious dissatisfaction with government performance in facilitating economic and social development and meeting the increasing needs of the masses (Keating, 2001) in developing market economies.

4. Deployment of AI in Public Governance and Management

Artificial Intelligence has the potentials of impacting the field of public administration not just for the present but in many years to come (Shark, 2019). This is quite clear as the value of AI in public governance, transportation industry and for gaining competitive advantage in the global market and economy have long been recognized by such countries like United States of America, China, United Kingdom, etc. (Reis, Santo & Melao, 2019; Wirtz, Weyerer & Geyer, 2018). Artificial Intelligence has the capacity to aid the automation of tasks in public governance with speed, accuracy and efficiency. AI is driving digital revolution and transformation in public institutions responsible for interest aggregation, formulation of public policies and provision of social services.

Since the outbreak of the COVID-19 pandemic in 2020, the world of work has experienced increase in the automation of work processes on the grounds of efficiency, better and quality service delivery, time conservation, speed in delivery assigned tasks, cost reduction in running organization and accuracy in processing and interpreting large volume of data. This has placed a compelling demand for collaborative efforts between state and non-state actors, government and business organizations in handling resistance to the adoption of AI and resolving skills shortages through appropriate training and development in AI technologies and targeted investments.

According to Shark (2021), the field of public administration is witnessing AI revolution that can best described as “augmented intelligence” in which machine learning provides insights into data patterns, predictive analytics, anomalies and trend analysis. He observes that AI as “augmented intelligence” is probably the single most prospective emerging tech in public management in decades. As computing technologies increases, there is need to create a conducive AI environment by collaboratively involving experts from disciplinary communities like science, philosophy, research, humanities, political science, history, ethics, psychology, management, and public policy think tanks and leaders at the federal, state, and local levels (Shark, 2021).

For the purpose of a clearer disquisition of the uses and deployment of AI in public governance, the discussion looks the impact of AI in Public Financial Management and Accountability,

Intergovernmental Relations; Public Policies and Implementation; Public Security Management, Politics, Human Resource Management and Research in Public Administration

AI and Public Financial Management and Accountability: AI technologies and systems have the potentials of revolutionising public financial management and accountability by exposing areas of linkages in tax administration; manage financial matters and solve revenue problems faced by public agencies. Through the enhancement of internal and external controls in a country's financial system and by spotting anomalies in large volumes of data, AI systems aid the reduction of accounting errors, identification of risks and avert tax fraud and financial crime. Furthermore, through automating routine processes in government, they allow agencies to focus their human energies in areas where it counts most – using insights from data to make better and productive decisions (Atalla & MacDonald, 2019). They argue that for AI to be productively useful in public financial management, it is important to ensure that audit reports, macro-economic statistics, source data provided by taxpayers, data from banks and other intermediaries) must be consistent, transparent, reliable and available in a timely manner. The Swedish Tax Authorities deploy AI and virtual assistants' tool like Skatti to handle over 15,000 citizen queries about tax returns a month, thus, tax services more personal, accessible and efficient (Atalla & MacDonald, 2019).

Writing further on the contributions of AI technologies to public management from the perspective of public financial management, Atalla & MacDonald (2019) notes the following:

- Tax authorities across some countries in the world are deploying AI models along with analytics to predicts higher-risk tax payers. The consequence of such deployment is enhanced revenue generation and lower tax evasion.
- Governments can also utilise AI to predict corruption and identify fraud and financial irregularities. For instance, researchers at the University of Valladolid in Spain have developed computer model that calculates the probability of corruption taking place in Spain. The model, which is grounded on neural networks, also identifies factors that facilitate corruption in the public sector.
- Denmark as a country is deploying AI and blockchain for faster, transparent and more effective processing of welfare payments to registered beneficiaries. United Kingdom is also tapping into the benefits of AI as the UK's Department for Work and Pensions is employing AI algorithms to track down large-scale corruption in its social welfare programs.
- AI technologies has the capacity to streamline and transform procurement procedures/processes thereby save cost and time. For instance, the US Air Force recently declared plans to use AI to make sense of complex acquisition guidelines and hasten the process of buying goods and services.
- AI has the potential to change the way governments' finance functions operate by creating a reliable system built on digital trust, transparency and cost efficiency. But to reap the full rewards, revenue and finance agencies need to trust their own data as well as the AI system they deploy. And they need to build the same trust among citizens.

AI and Intergovernmental Relations

Artificial intelligence technologies have the potential of contributing to healthy and productive intergovernmental relations between and among government agencies through the exchange of information and the processing of large volume of data usually associated with such relationships.

Furthermore, Artificial intelligence (AI) has the potential to impact intergovernmental relations (IGR) in several ways, including:

1. Improved communication: AI-powered chatbots and virtual assistants can facilitate communication between different levels of government and provide citizens with instant support and guidance on public services.
2. Data sharing: AI can help streamline the process of data sharing between different levels of government by automating data extraction, cleaning, and integration.
3. Predictive analytics: AI algorithms can use historical data to predict future outcomes, which can inform policy decisions and planning across different levels of government.
4. Cost reduction and savings: AI can help governments save money by automating routine tasks, such as data entry and processing, and improving the efficiency of public services.
5. Interoperability: AI can help standardize data formats and enable interoperability between different levels of government, making it easier to share data and coordinate policy.

However, there are also potential challenges associated with the use of AI in IGR, such as concerns over data privacy and security, the potential for bias in AI algorithms, and the need for effective governance frameworks to ensure that AI is used responsibly and ethically by the agencies and parties involved. To realize the potential benefits of AI in IGR, it is important to address these challenges and develop effective policies and regulations.

AI and Public Policy Management and Implementation

Perhaps, one of the areas that AI has impacted most in public governance is the formulation and implementation of public policies and programmes. AI technologies provide data-driven solution to facilitate problem identification, agenda setting, and policy formulation, pattern detection of needs, detection of anomalies, policy projection and intelligent forecasting and evaluation of public policies and programmes. AI's ability to process large volume of data intelligently and within a short time can help to enhance evidenced based public policy making and implementation in developed and developing market economies. The collection and processing of data on citizens needs/interests, complaints and agitations can be intelligently and accurately handled with the use of AI tools.

According to Patel et al (2021), AI technologies have the capacity to integrate science to the art of policymaking and can assist policymakers generate value and impact in the policymaking cycle through the following ways:

1. Problem Identification by synthesizing large data sets to detect patterns and highlight deserving areas and topics
2. Policy formulation by performing scenario analysis and forecasting policy options at a granular level
3. Adoption stage-Collecting data insights to facilitate the making of policy decisions
4. Implementation Phase: Increasing service delivery speed of public institutions and performing real-time corrections to enhance effectiveness
5. Evaluation Stage: Making policies more impactful by suggesting areas of adjustment and improvements

In a more concrete term, Patel et al (2021) stated how the use of AI is providing data solution to public policy. The stated for instance that "the UN Global Pulse, a big data and AI initiative, is using information from mobile phone airtime purchases and anonymized call records to track poverty and influence health and food policy. Governments can also use this platform to build trust and transparency with the public by creating open data policies. Dubai, for example, sees open data as a critical element of becoming a smart city" (paragraph 21).

AI and Public Security Management

AI has made its way into public security management in both developed and developing countries. Countries are investing and deploying AI technologies to ensure the protection of lives and property and to protect their territorial integrity. In the African continent, some African countries are committing financial resources into Artificial Intelligence technologies to boost efficiency in public governance. For instance, to ensure the safety of lives and property in Nairobi, the Kenya's capital city, the government is employing AI-powered facial recognition video surveillance technology to complement policing efforts and expedite case-solving (Yeboah, 2020). Developed countries (like the United States of America, United Kingdom, Canada, etc.) and some developing countries like Nigeria, South Africa, etc.) are utilizing AI technologies to combat cybercrime, internet fraud and protect internet users, government data infrastructure. Law enforcement agencies in the United States are using AI to enhance public safety. For example, the Los Angeles Police Department uses AI to analyze crime patterns and predict where crimes are likely to occur, allowing for targeted patrols and crime prevention efforts. A lot is yet to be achieved in the use of AI to enhance cybersecurity and protect data infrastructure of government and companies. This is because, AI technologies have expanded the scale of cybercrimes and cybercriminals deployed AI tools to enhance the effectiveness of traditional cyberattacks. Many AI applications are designed by software engineers to bypass automated defences that protect IT installations and systems. For instance, Europol report have observed that AI are used by cybercriminals to craft suspicious emails that can bypass spam filters (Morrison, 2022). The rise in cybercrimes and attacks is also paying off by expanding the market for cybersecurity products. Collaborating this Violino (2022), noted that the increase in cyberattacks globally is fueling growth in the demand for AI-based security products. For instance, the global market for AI-based cybersecurity products is projected to rise to $133.8 billion by 2030, far from its market value $14.9 billion in 2021.

AI and African Political Landscape

Yeboah (2020), has also written to demonstrate the influence of AI on African political landscape. He noted with examples, that, sensitive information about citizens and political opponents can be obtained through the aid of AI technologies by political and economic elites and be used to manipulate the conscience of the public for selfish political and economic gains. Yeboah (2020, paragraphs 5 & 6) observes that:

> *In Africa, the impact of AI and data optimization technologies on politics has been significant in two ways – communication and the exchange of information between individuals, government and societies. Even though technology is argued to be politically neutral, its negative or positive impact on politics is dependent on who owns or has significant access to the technology. In fact, AI-powered deepfakes –manipulated videos that can make people appear to do or say things they never did – were predicted to be the greatest threat to the 2020 elections across Africa and likely to destabilize national politics. The recent scandal of Cambridge Analytica's significant role in African politics, notably in Kenyan and Nigerian elections, are examples of how African politicians and economic elites have colluded with foreign AI firms to capture sensitive data of citizens. This data – conversations, thoughts, decisions, consumption patterns, fears, concerns and emotions – can be used to inundate citizens with targeted misinformation about political opponents. For example, one month prior to Kenya's election, Kenyans woke up to an online video titled Raila 2020 which*

> *communicated that Kenya would become extremely violent, food would be scarce, there would be water shortages and so on if Raila Odinga was allowed to be president.*

For a balanced disquisition, Yeboah (2020) presented the positive impact of AI technology on African political space. In this regard, he argued that although AI technologies have served as a manipulative tool in authoritarian states in Africa, the technology has also been deployed to enhanced public accountability, political pluralism, civil liberties, and civic participation by strengthening transparency and democratizing communication platforms. Put differently, AI technologies can serve as useful tools in enhancing political communications and engagements.

AI and HRM in the Public Sector

AI is providing more transparent Human Resource Management Tools for use in the public and private sectors. Such tools have the capacity to handle, process, integrate and store information on personnel matters. For instance, Onpassive, AI driven company based in United States of America with branches in India, Singapore, Dubai recently developed AI driven staff management software called O-Staff. O-staff is a comprehensive automated software for recruiting and hiring of workers, leave management, processing staff payroll, managing employee profile, tracking workers' performance, administration of workers' benefits, employee onboarding, etc. O-staff also incorporate social elements in the workplace like marriage anniversaries, birthday celebrations, etc. (Onpassive, 2023).

AI and Research Development in Public Administration

Given the present and futuristic impact of Artificial Intelligence on public management and governance, there is a growing number of researches conducted and courses offered which attempt to relate AI to the field of public administration. The courses are deigned mostly at the graduate level to exposed students to the dynamic role that AI can play in improving public service delivery. AI researches in Public Administration are diverse in terms of issues discussed. Topics of coverage are: AI and Public Administration; AI applications in Public Administration; Implications of AI Deployment in Public Governance; Ethics and Legalism in Artificial Intelligence; AI and Security, Theoretical Framework for AI in Public Administration, Digital Public Administration and Management; AI Dynamism in Political Space and Analysis, AI and Society, The Future of AI in Publication, AI and Digital Public Administration and Democracy; Data Infrastructure in Public Administration; etc.

In terms of research advancement and development, artificial intelligence (AI) has the potential to impact the field of public administration. Here are some examples of how AI has facilitated the advancement of public administration research:

1. Data analysis: Artificial intelligence (AI) is capable of processing vast volumes of data fast and correctly, enabling researchers to examine complex data sets and spot patterns and trends. This can aid decision-making and point out potential research areas for further studies.
2. Predictive analytics: AI algorithms can forecast and estimate future results using historical data, which can be utilized to guide planning and policy decisions. Predictive analytics, for instance, can be used to forecast demand for public services like transportation, security and healthcare.

3. Natural Language Processing (NLP): This is a branch of artificial intelligence that allows machines to comprehend and analyze human language. To determine public sentiment and opinion, NLP can be used to examine public policy texts, social media data, and other kinds of unstructured data.
4. Fraud detection: Artificial intelligence (AI) can be used to spot dishonest behavior in government systems, such welfare fraud or tax evasion. Governments can deploy this to save money and make sure that resources are used prudently and effectively.
5. Chatbots and virtual assistants: AI-powered chatbots and virtual assistants can offer citizens immediate support and direction on government services like submitting a permit application or paying taxes.

In summary, AI has the potential to revolutionize research and development in Public Administration by providing accurate and efficient data analysis, predicting future outcomes, and improving citizen engagement and satisfaction. This could be a significant benefit to the field.

AI and Transportation Sector Management

AI has been deployed in the management of traffic in developed countries and big cities. This is particular important considering the impact of AI in reducing road accidents. The World Bank estimated that 1.3 million individuals die annually from road accident. However, AI technology is demonstrating its worth in the transportation sector, addressing traffic flow analysis. AI and machine learning algorithms are capable of analyzing crash data and identifying high-risk areas to implement additional safety measures and control traffic flow. The U.S. Department of Energy's TranSEC and GRAIDSMART, utilizing a fisheye camera to track moving objects, are outstanding instances of this technology. Furthermore, V7's image and video annotation tools provide government organizations with the capability to manage high-quality datasets and develop robust traffic models with advanced monitoring capabilities (Sajid, 2023).

Defining the Research Agenda of AI in Public Management and Governance in Developed and Developing Market Economies

AI is becoming increasingly integrated into public management and governance in both developed and developing market economies. As we navigate this landscape, several key areas of interest have emerged for researchers:

1. Ethical and legal considerations: With the widespread use of AI in public management and governance, it's important to develop ethical and legal frameworks to guide its use. Research is necessary to identify potential ethical and legal implications and to create guidelines and regulations to ensure responsible and transparent use.
2. Impact on public services: AI has the potential to transform public services, making them more efficient, effective, and accessible. Research is needed to identify specific ways in which AI can be used to improve public services and evaluate its impact on service quality.
3. Citizen engagement and participation: AI can enhance citizen engagement and participation in public management and governance by providing new channels for communication and collaboration. Research is needed to identify how AI can be used to improve engagement and participation, and to evaluate its impact on citizen attitudes and behaviors.
4. Data management and security: AI relies heavily on data, and it's important to develop robust data management and security frameworks to protect sensitive data and ensure appropriate

use. Research is necessary to identify data management and security challenges and create effective solutions.

5. Capacity building: Effective use of AI in public management and governance requires specialized skills and expertise. Research is needed to identify specific skills and competencies needed and to develop training and capacity-building programs for public managers and policymakers.

5. Case Studies on the Use of AI in Public Management and Governance in Developed and Developing Market Economies

AI has the potential to revolutionize public management and governance in both developed and developing economies. Here are some examples of how AI has impacted public management and governance in various countries:

1. **Singapore:** The Singapore government has implemented AI to enhance its public services. One example is the "Virtual Assistant" chatbot, which uses natural language processing and machine learning to assist citizens with government-related inquiries.
2. **Estonia:** Estonia is often cited as a successful example of digital governance. AI is utilized to improve public services, such as healthcare and education. The Estonian e-Health system, for instance, uses AI algorithms to analyze patient health data and provide personalized treatment recommendations.
3. **India:** The Indian government is employing AI to upgrade its public services, specifically in healthcare and agriculture. For example, the "Ayushman Bharat" program leverages AI algorithms to detect health risks and provide preventative healthcare measures.
4. **United Kingdom:** The UK government is relying on AI to improve public services, particularly in law enforcement and criminal justice. The police are using facial recognition technology to identify suspects and prevent crime. The technology utilizes AI algorithms to analyze facial features and match them with a database of known suspects. The UK government has also deployed the use of AI to improve and facilitate diagnosis in the health sector. For instance, the UK National Health Service has created an AI tool that can swiftly identify heart disease in just 20 seconds while the patient is undergoing an MRI scan. Typically, it would take a physician over 13 minutes to manually analyze the MRI scans of a patient (Sajid, 2023).
5. **China:** The Chinese government has implemented AI to enhance public services and governance. The "Social Credit System" is a notable example, which uses AI algorithms to track citizens' behavior and assign a "social credit score." The system has sparked controversy due to concerns about privacy and freedom.
6. **United States:** The US government is using AI in various public services, such as healthcare, education, and defense. For example, the US Department of Defense is using AI to enhance military operations and cybersecurity. The technology is also being used to improve healthcare services, such as medical imaging analysis and patient risk assessments. The U.S. Centers for Disease Control and Prevention also utilizes AI technology to simplify the process of tracking and reporting on polio virus. This tool can recognize different types of viruses and group together various disease reports. Additionally, AI is being used in education to create personalized learning experiences for students.
7. **Ghana:** Ghana is one of the African countries that has been implementing AI in public management and governance. One notable example is the "Ghana Open Data Initiative," and “Ghana Data Exchange Hub” which use AI to analyze data and provide insights that can help inform policy decisions (Ministry of Communications of the Government of Ghana,

2019). The initiative is also using AI to create chatbots that can interact with citizens and provide information about government services.

8. **South Africa:** South Africa is also implementing AI in public management and governance. One example is the "Smart Township Project," which uses AI and IoT (Internet of Things) technologies to improve service delivery in townships. The project aims to create a more efficient and sustainable urban environment by using AI to optimize energy consumption, waste management, and transportation.
9. **Kenya:** Kenya is using AI to improve public services, particularly in healthcare, agriculture, education, security, finance, etc. (Paradigm Initiative, 2022). For example, the "AfyaData" platform uses AI to analyze health data and provide recommendations for disease prevention and treatment. The platform is also being used to track the spread of diseases, such as COVID-19. In agriculture, AI is being used to improve crop yields and monitor soil conditions.
10. **Nigeria:** Nigeria is one of the African countries that is adopting AI in public management and governance. The Nigerian government has established "The National Centre for Artificial Intelligence and Robotics (NCAIR)" to transform the Nigerian digital economy (NITDA, 2023). There are efforts at using AI and big data to improve research and education outcomes in the country. It is our conviction that AI can be deployed to build a new Nigeria of our dream where things work effectively and efficiently. Agba et al (2023) in a paper advocated the building of a new Nigeria of our dream where things work based on the principles of honesty, meritocracy and pragmatism. The initiative is also using AI to create chatbots that can interact with students and provide information about educational resources and opportunities. In the assessment of university government and management, there is need to explore how AI can be deployed to improved the workplace of higher educational institutions in such crisis situations like the COVID-19 pandemic. Agba et al (2022) wrote extensively on the challenges posed by the COVID-19 pandemic in Africa's educational industry. The AI technology might well be a tool for ameliorating the effect of the disruption in academic calendars occasioned by the COVID-19 pandemic.
11. **Canada:** Canada is using AI in various public services, including healthcare, transportation, and climate change. For example, the Canadian government has launched the "AI for Health" initiative, which aims to use AI to improve patient outcomes and healthcare service delivery. There are about 362 AI in Healthcare startups in Canada (Tracxn, 2023). In transportation, the government is using AI to optimize traffic flow and reduce congestion. Additionally, AI is being used to monitor and mitigate the impact of climate change, such as by analyzing satellite data to track changes in forest cover.
12. **Predictive maintenance for public infrastructure in Japan:** The Japanese government is using AI to predict maintenance needs for public infrastructure, such as bridges and tunnels. The system uses data from sensors to predict potential issues and schedule maintenance before failures occur. This has improved safety and reduced maintenance costs (Global Infrastructure Hub, 2020).
13. **France:** Capgemini, a French consulting firm, collaborated with Google to create AI software that analyzes aerial imagery to locate undeclared properties. This software successfully detected 20,000 undeclared pools in France, which resulted in an additional €10m in tax revenue. The authorities plan to utilize the software to identify other undeclared features such as patios, gazebos, and home extensions (Sajid, 2023).

These case studies illustrate the diverse ways in which AI is being used to transform public management and governance in both developed and developing market economies. While there are

undoubtedly challenges and risks associated with AI implementation, these examples suggest that AI has the potential to improve public services and benefit citizens in many different ways. While AI represents a technological shift that has the potential to bring significant benefits, it is important to address potential challenges and risks, such as the potential for bias in AI algorithms and the need to ensure privacy and security of citizens' data. Governments need to ensure that AI is implemented in a responsible and transparent manner, with appropriate regulation and oversight.

6. Limitations in the Usage of AI in Public Governance and Management

While AI presents numerous opportunities, it also presents significant challenges that must be addressed for successful adoption. Firstly, ethical considerations must be taken into account, such as the potential for AI to cause harm, infringe on privacy rights, and perpetuate biases. For example, facial recognition software has been criticized for being biased against people with darker skin tones. Secondly, AI can be biased and discriminatory if not designed and trained properly. Thirdly, data privacy and security concerns must be addressed, especially when sensitive data is involved.

Fourthly, AI application in public governance can be so sophisticated requiring intensive training and knowledge. Currently, there are gaps between supply and demand of AI experts, capturing the war of talent in the field. The field of AI is still growing and few hands exist to meets growing demands of experts in the private and public sectors. The lack of technical expertise and skills among public servants can hinder successful adoption and effective use of AI in public management and governance.

Furthermore, AI technologies are expensive and very few countries are willing to commit public resources as investment for manpower and software development in AI. The high cost of implementing and maintaining AI systems can be a significant barrier for many governments, particularly those in developing market economies. It is estimated that global investment in AI researches and application will hit 500 billion USD by 2024 and the field has the potential of contributing about 15.7 trillion USD to global economy by 2030 (Popkin, Ohnsman & CaI, 2022). As part of the limitations associated with AI usage, it has been exploited to further cybercrimes and political manipulations especially in developing economies where authoritarian regimes exist. Furthermore, many persons are unaware of the field of AI as it applies to social and administrative space. It is doubtful, to trust the extent to which AI can be deployed to enhance public policy making and implementation in an environment where the reliability and correctness of data used in AI technologies is not guaranteed.

7. Conclusion and Recommendations

We have examined the areas that AI technologies can be deployed to enhance public governance and management in developed and developing economies. AI being multidisciplinary in nature can complement social service delivery in terms of public policy formulation and implementation, human resource management, public security management, public financial management, interpretation of political landscape, projection and forecasting and the career prospects that AI industry offers to the people who have relevant training and knowledge in the field is expanding. The COVID-19 pandemic of 2020 serves to enlarge these prospects. AI is offering brighter career prospects to youths in developing countries and may well serve as a medium for addressing unemployment challenges. Committing resources as investment to develop the field of AI will continue to grow in the years to come and it is expected that global, regional and country based ethical guidelines will be developed for the field of AI. In relations to AI application in public administration, there are virgin areas of

research to explore, such, as the theoretical framework for AI, AI and Intergovernmental relations, the future of AI in addressing poverty level in developing countries.

References

Agba, M. S., Agba, G. E. M., Ettah, G., Enang, A. U., & Ata-Agboni, J. U. (2023). Building a New Nigeria Where Things Work: Meritocracy, Pragmatism and Honesty Principles as Mode of Analysis and Prescription (MoAP). *Journal of Public Administration, Policy and Governance Research*, *1*(1), 1–12. Retrieved from https://jpapgr.com/index.php/research/article/view/3

Agba, M. S., Ocheni, R. I., Ocheni, S. I., Ettah, G., Abang, P. O., Paul, S. O., & Agba, G. E. M. (2022). COVID-19 and the workplace of higher educational institutions in developing market economies: Lessons, policy options and the emerging new normal [Special issue]. *Corporate & Business Strategy Review*, *3*(2), 328–338. https://doi.org/10.22495/cbsrv3i2siart14

Amaresh, P. (2020). Artificial Intelligence: A New driving horse in International Relations and Diplomacy. https://diplomatist.com/2020/05/13/artificial-intelligence-a-new-driving-horse-in-international-relations-and-diplomacy/#:~:text=As%20per%20the%20report%2C%20AI,diplomatic%20missions%20and%20so%20on.

Atalla, G. & MacDonald, M. (2019). How AI can Help Government Manage their Money Better. https://www.ey.com/en_gl/consulting/how-ai-can-help-governments-manage-their-money-better

Frankenfield, J. (2022). Artificial Intelligence: What It Is and How It Is Used. https://www.investopedia.com/terms/a/artificial-intelligence-ai.asp

Fukuyama, F. (2013). What is governance? *Governance-An International Journal of Policy, Administration, and Institutions*, 26(3), 347–368. https://doi.org/10.1111/ gove.12035.

Global Infrastructure Hub (2020). Sensors and Machine Learning for Predictive Maintenance. https://www.gihub.org/infrastructure-technology-use-cases/case-studies/sensors-and-machine-learning-for-predictive-maintenance/

Great Learning Team (2023). What is Artificial Intelligence in 2023? Types, Trends, and Future of it? https://www.mygreatlearning.com/blog/what-is-artificial-intelligence/

Keating, M. (2001). Public Management Reform and Economic and Social Development. *OECD Journal on Budgeting.* https://www.oecd.org/governance/budgeting/43515306.pdf.

Lexology (2017). Artificial Intelligence (AI): What is it and how does it work? https://www.lexology.com/library/detail.aspx?g=5424a424-c590-45f0-9e2a-ab05daff032d#:~:text=The%20Oxford%20Dictionary%20defines%20Artificial,making%2C%20and%20translation%20between%20languages.

Lynn, L. E., Heinrich, C. J., & Hill, C. J. (2000). Studying governance and public management: Challenges and prospects. *Journal of Public Administration Research and Theory*, 10(2), 233–262. https://doi.org/10.1093/oxfordjournals.jpart.a024269.

Ministry of Communications of the Government of Ghana (2019). The National Data Sharing Policy of the Government of Ghana. https://data.gov.gh/sites/default/files/Ghana%20National%20Data%20Sharing%20Policy%20Draft%203.0.pdf

Morrison, R. (2022). How AI will extend the scale and sophistication of cybercrime. https://techmonitor.ai/cybercrime-future/ai-cybercrime

NITDA (2023). The National Centre for Artificial Intelligence and Robotics. https://nitda.gov.ng/ncair/

Onpassive (2023). O-Staff. https://www.onpassive.com/products/o-staff/

Outsight Insight (2023). Global AI investment to top £150 billion by 2025. https://outsideinsight.com/insights/global-ai-investment-150-billion-2025/

Paradigm Initiative (2022). *Policy Brief: Artificial Intelligence in Kenya.* https://paradigmhq.org/wp-content/uploads/2022/02/Artificial-Inteligence-in-Kenya-1.pdf

Patel, J., Manetti, M., Mendelsohn, M., Millis, S. Felden, F. & Littig, L. (2021). AI Brings Science to the Art of Policymaking. https://www.bcg.com/publications/2021/how-artificial-intelligence-can-shape-policy-making

Popkin, H. A. S., Ohnsman, A. & CaI, K. (2022). The AI 50. https://www.forbes.com/lists/ai50/?sh=24cb5f4a290f

Reis, J., Santo, P. E. & Melao, N. (2019). Impacts of Artificial Intelligence on Public Administration: A Systematic Literature Review. *2019 14th Iberian Conference on Information Systems and Technologies (CISTI)*, Coimbra, Portugal, 2019, pp. 1-7, doi: 10.23919/CISTI.2019.8760893.

Sajid, H. (2023). Seven Practical Applications of AI in Government. https://www.v7labs.com/blog/ai-in-government

Shark, A. R. (2019). Introduction. *AI and Its Impact in Public Administration.* Washington D.C.: National Academy of Public Administration.

Shark, A. R. (2021, Artificial Intelligence and Intergovernmental Relations- Connecting More than Dots, https://federalism.us/2021/11/artificial-intelligence-and-intergovernmental-relations-connecting-more-than-dots/

Tracxn (2023). AI in Healthcare Startups in Canada. https://tracxn.com/explore/AI-in-Healthcare-Startups-in-Canada

Trueman, C. & Lago, C. (2019). How Singapore is Using Artificial Intelligence. https://www.cio.com/article/221994/how-singapore-is-using-artificial-intelligence.html

Violino, B. (2022). Artificial intelligence is playing a bigger role in cybersecurity, but the bad guys may benefit the most. https://www.cnbc.com/2022/09/13/ai-has-bigger-role-in-cybersecurity-but-hackers-may-benefit-the-most.html

Wirtz, B. W., Weyerer, J. C., & Geyer, C. (2018). Artificial Intelligence and the Public Sector: Applications and Challenges, *International Journal of Public Administration*, *42* (7): 1-20. DOI: 10.1080/01900692.2018.1498103

Yeboah, K. (2020). How AI is transforming Africa's political landscape. https://democracyinafrica.org/how-ai-is-transforming-africas-political-landscape/