**VILNIUS UNIVERSITY
BUSINESS SCHOOL**

INTERNATIONAL PROJECT MANAGEMENT

TOBI RAPHAEL AJAYI

MASTER'S THESIS

Dirbtinio intelekto (DI) taikymas kaip projektų valdymo pagalbininko Nigerijos sveikatos apsaugos sektoriuje: galimybės ir įgyvendinimo iššūkiai.	Artificial Intelligence (AI) as a Project Management Assistant: Application and Implications for the Nigerian Healthcare Sector.

Academic Supervisor: Skirmantas Gricius

Vilnius, 2025

Summary

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Master's thesis (project) was prepared in Vilnius, in 2025

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This research investigated the opportunities and implementation challenges of using Artificial Intelligence (AI) as a project management assistant in public healthcare institutions in Nigeria. The data used were collected through survey and semi-interview. Non-probabilistic sampling techniques such as judgmental and snowball were adopted to sample 44 participants. The data collected were analysed using mixed approaches (questionnaire and semi-interview). Findings revealed that project management practices (project planning, project monitoring and project execution) in Nigerian health institutions were positively and significantly impacted by the AI applications ($p<0.05$). Findings also revealed that improved real-time data analysis, accurate planning and forecasting, optimal scheduling, risk detection and management ability, predictive monitoring, reduction in human error and better decision making were the opportunities offered by applying AI in project management practices in Nigerian healthcare institutions. Several challenges such as inadequate IT infrastructure, cost of implementation and maintenance, weak policies and regulation guidelines, preference for manual methods and poor data privacy and protection were also identified as hindrance to AI implementation in healthcare institutions in Nigeria. The study concluded that using AI within Nigerian healthcare institutions not only assists project managers but contributes significantly to health related projects. The study recommended that Nigerian health departments need to collaborate or partner with AI developers, tech companies to encourage customization of AI tools that fit into the local health system requirement. Also, Nigerian government and healthcare institutions should improve their

IT infrastructures including network connection, to support real time data analysis, planning, forecasting and monitoring.

Keywords:

Project management, project manager, AI, planning, monitoring, execution, healthcare institutions.

Santrauka

VILNIAUS UNIVERSITETO VERSLO MOKYKLA

TARPTAUTINĖ PROJEKTŲ VADYBA

TOBI RAPHAEL AJAYI

Dirbtinio intelekto (DI) taikymas kaip projektų valdymo pagalbininko Nigerijos sveikatos apsaugos sektoriuje: galimybės ir įgyvendinimo iššūkiai.

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Šiame tyrime buvo nagrinėjamos dirbtinio intelekto (DI) kaip projektų valdymo asistento naudojimo galimybės ir įgyvendinimo sunkumai viešosiose sveikatos priežiūros įstaigose Nigerijoje. Duomenys buvo renkami atliekant apklausą ir pusiau interviu. 44 dalyvių imčiai atrinkti buvo naudojami neprobabilistiniai atrankos metodai, pvz., vertinamasis ir sniego gniūžtės. Surinkti duomenys buvo analizuojami naudojant mišrius metodus (anketa ir pusiau interviu). Rezultatai parodė, kad AI taikymas turėjo teigiamą ir reikšmingą poveikį projektų valdymo praktikoms (projektų planavimui, stebėjimui ir vykdymui) Nigerijos sveikatos priežiūros įstaigose ($p < 0,05$). Rezultatai taip pat parodė, kad geresnė realaus laiko duomenų analizė, tikslus planavimas ir prognozavimas, optimalus tvarkaraščių sudarymas, rizikos nustatymas ir valdymo gebėjimai, prognozuojamas stebėjimas, žmogiškųjų klaidų mažinimas ir geresnis sprendimų priėmimas buvo galimybės, kurias suteikė AI taikymas projektų valdymo praktikose Nigerijos sveikatos priežiūros įstaigose. Taip pat buvo nustatyti keli iššūkiai, tokie kaip netinkama IT infrastruktūra, įgyvendinimo ir priežiūros išlaidos, silpnos politikos ir reguliavimo gairės, pirmenybė rankiniams metodams ir prasta duomenų privatumo ir apsaugos politika, kurie trukdo AI diegimui Nigerijos sveikatos priežiūros įstaigose. Tyrime padaryta išvada, kad AI naudojimas Nigerijos sveikatos priežiūros įstaigose ne tik padeda projektų vadovams, bet ir labai prisideda prie su sveikata susijusių projektų. Tyrime rekomenduojama, kad Nigerijos sveikatos departamentai bendradarbiautų ar partneriautų su AI kūrėjais, technologijų įmonėmis, siekdami skatinti AI įrankių pritaikymą vietos sveikatos sistemos reikalavimams. Be to, Nigerijos

vyriausybė ir sveikatos priežiūros įstaigos turėtų tobulinti savo IT infrastruktūrą, įskaitant tinklo ryšį, siekdamos palaikyti realaus laiko duomenų analizę, planavimą, prognozavimą ir stebėjimą.

Raktažodžiai:

Projektų valdymas, projektų vadovas, AI, planavimas, stebėjimas, vykdymas, sveikatos priežiūros įstaigos

TABLE OF CONTENTS

LIST OF TABLES AND FIGURES

INTRODUCTION

Relevance of the study

Project management has become essential in healthcare systems around the world, especially in countries like Nigeria where resources are limited and development challenges are widespread. In such environments, how health-related projects are planned and executed can directly affect the quality of life for millions. Project management provides the structure to organize resources, manage timelines, and achieve set outcomes across interventions and infrastructure projects (PMI, 2021).

Healthcare institutions are unique organizations that operate every day of the year without interruption, they focus heavily on daily operations and provision of excellent care for patients, which need to be managed in a planned, coordinated and efficient way to make best use of the resources as well as minimize cost and waste (Cristina et al., 2024).

Yet, in Nigeria's public healthcare sector, the story is more complex. Many projects still rely on outdated planning methods (paper-based strategic plans, fixed budget planning, manual resource allocation, top-down planning without data input) and manual tracking systems such as paper register for patients and manual attendance and payroll tracking (Manho, 2024). These outdated ways of planning and managing healthcare projects often leads to budget overruns, missed deadlines, or, in the worst cases, abandoned facilities and slow decision making because they are too rigid, does not support proper allocation and utilization of resources as well do not support easy change when new problems occur (Science for Africa, 2022). According to data from Nigeria's National Bureau of Statistics (2023), around 40% of government-funded health projects in the country face some form of disruption during execution due to either planning failures or weak monitoring systems.

This is not just a technical issue; it has real human consequences. In a country of over 200 million people, where basic healthcare is already hard to access for many, project failures make the situation worse. There is growing urgency for smarter, more responsive ways to manage public sector projects particularly in healthcare, where mistakes cost lives (Statista, 2025; World Bank, 2024).

One technology that is currently drawing global attention for its potential role in solving this problem is Artificial Intelligence (AI). More than just a buzzword, AI tools are being used

around the world to improve how projects are designed, monitored, and adjusted in real time. From predictive analytics to risk tracking and communication support, AI can change how project managers approach their daily work (Okwukwu et al., 2025). Artificial Intelligence has been reshaping industries in Nigeria, particularly health sector, enhancing service efficiency, act as a supportive tool in project management and providing potentials to revolutionize execution of health related projects (Wamba-Taguimdje et al., 2020; Okwukwu et al., 2025)

However, in Nigeria, the story is still evolving. While sectors like finance and education are slowly integrating AI, its use in managing health-related projects remains rare. Most hospitals and public institutions are still dependent on spreadsheets, paper records, or siloed digital systems (Odunuga et al., 2024).

As Nigeria continues to face major public health setbacks such as limited health capital (shortage skilled project management personnel), inadequate infrastructure, poor project monitoring system, embarking on this research combined with little academic literature that specifically explores the opportunities and risks of using AI to support project management in the Nigerian healthcare context, this research serves as a huge contribution to the body of knowledge. This research aims to explore how AI can assist healthcare project managers by improving planning, tracking, and coordination. At the same time, it will investigate the challenges that might limit its use, such as lack of infrastructure, technical skills, or institutional support. The goal is not just to imagine what AI could do in theory, but to understand how it might be realistically applied in practice within the Nigerian context.

Research Uniqueness: This research seeks to explore whether and how AI technologies can support healthcare project managers in enhancing planning, tracking, and coordination processes. At the same time, it will investigate the challenges that might limit its use, such as lack of infrastructure, technical skills, or institutional support. The goal is not just to imagine what AI could do in theory, but to understand how it might be realistically applied in practice within the Nigerian context.

This study therefore provides both theoretical and practical value. It adds to the growing body of work on project management and artificial intelligence while offering grounded insights into one of the most critical sectors in Nigeria's public service landscape healthcare.

Research Questions

i. What roles can Artificial Intelligence (AI) play in improving project management practices within Nigerian healthcare institutions?

ii. What are the key opportunities that AI presents for planning, monitoring, and executing healthcare-related projects?

iii. To what extent has AI adoption improved project planning, monitoring, and executing in Nigerian healthcare instructions?

iv. What implementation challenges could hinder the adoption of AI as a project management assistant in Nigeria's healthcare sector?

Research Objectives: This thesis aimed at investigating the opportunities and implementation challenges of utilizing Artificial Intelligence as a project manager assistant in Nigerian healthcare institutions.

To achieve the aim of this study, this study will:

i. Critically review existing literature on AI applications in project management, particularly in the healthcare sector;

ii. Examine the impact of AI application on project management practices within healthcare institutions in Nigeria

iii. Identify the opportunities AI offers for improving planning, monitoring, and execution in health-related projects;

iv. Investigate the key technological, organizational, and institutional barriers to AI adoption

Methodological Approach: This research utilised a mixed-methods approach (quantitative and qualitative methods) to understand how Artificial Intelligence can support project the practices of management within Nigeria's healthcare sector. The choice of this approach is based on the need to gain both broad numerical trends and deeper insights from people directly involved in project delivery.

For the quantitative aspect, structured questionnaires will be shared with professionals such as project managers, IT experts, and health administrators working in selected Nigerian health institutions. The survey will help to gather data on their awareness of AI, how they perceive its usefulness, and what challenges they think might arise from using it. In order to support the data collected through survey (questionnaire) and to validate and strengthen the result from quantitative analysis, semi-structured interviews will be conducted online (team) to

collect well-detailed information from the participants based on their lived experience. These will involve selected practitioners with experience managing health projects or implementing technology-based systems. The aim is to hear first-hand how AI is being adopted, what barriers they have encountered, and what opportunities exist in real project environments.

A literature review will also be used to explore how AI has been used in project management across different contexts. This will help build the theoretical foundation of the study and serve as a reference point when comparing the findings from Nigeria.

To strengthen the accuracy and depth of the conclusions, the study will use triangulation. This means comparing the results from the survey, interviews, and literature to see where they align or differ. Doing so helps to cross-check findings and makes the conclusions more reliable.

The survey results will be analyzed using basic descriptive statistics, such as frequency tables and cross-tabulations. The interview data will be reviewed using thematic analysis, following the steps outlined by Braun and Clarke (2006), which involve reading the responses carefully, identifying patterns, grouping them into themes, and making sense of those themes in relation to the research questions.

Scope of the Study: This study looks at public-sector institutions in Nigeria, with a particular focus on the healthcare sector. For broader comparison and richer understanding, examples from education and construction sectors will also be included. The research will cover the core phases of project management planning, implementation, monitoring, and review while focusing mainly on how AI can be introduced into these phases. While the research is most applicable to government health institutions, lessons from it may be relevant to other sectors facing similar challenges.

Research Structure: This thesis is organized into five (5) sections, each addressing research problems while contributing to a comprehensive understanding of research objective context, methodology, and findings related to the adoption of Artificial Intelligence as a project management assistant within Nigeria's healthcare sector.

i. **First section-Introduction section:** The introductory part which is the first section of the thesis outlines the research background, relevance of research and research rationale. Other subheading presented under this section include uniqueness of the research, research objective, research questions and research scope and limitation

ii. **Second section-Literature:** The literature review presents existing theories and prior studies related to AI in project management. It identifies knowledge gaps and builds the conceptual and theoretical framework guiding the research.

iii. **Third section-Methodology**: This part explains the research strategy and methods used in collecting and analyzing data. It covers the research design, data sources, sampling approach, data collection tools, and the analytical approach applied.

iv. **Forth section-Empirical Findings and Discussion**: The findings section presents the results from both the qualitative and quantitative data sources. The discussion interprets these findings in relation to existing literature and the research objectives.

v.   **Fifth section-Conclusion and Recommendations**: This section summarizes the research findings, highlights key contributions, identifies limitations, and proposes recommendations for future practice and further research.

Research Contribution: This research is important both academically and practically. On the academic side, it fills a gap in current knowledge about how AI can support project execution in Nigeria's health sector. On the practical side, it offers project teams and policymakers evidence-based ideas that could lead to better results. For example, AI tools may help reduce project failures, improve stakeholder engagement, and support better planning.

Given Nigeria's ongoing struggle with infrastructure development and resource management, understanding how to bring AI into project management could make a real difference. This research hopes to provide not just answers, but also practical guidance for institutions thinking of taking this step.

1. THEORETICAL ANALYSIS OF ARTIFICIAL INTELLIGENCE IN PROJECT MANAGEMENT WITHIN NIGERIA HEALTH SECTOR.

1.1 Artificial intelligence

In this current competitive market, application of artificial intelligence is becoming a key determinant of business success, marking a significant shift from traditional business operation to a modern and future where Artificial Intelligence and innovation proficiency define market growth and leadership (Kim & Kim, 2023). The advent of Artificial Intelligence over the years has been a transformative solution reshaping industries and bringing revolution to the current business paradigm, challenging conventional strategies and embracing a new era of technological and digital transformation (Felicetti et al., 2024). Its application are widely spreading across different sector including health sector, education, manufacturing, banking, agricultural, telecommunication, retail, global marketing and many more where it digitalize and automate routine tasks like appointment scheduling, data entry, resources management, enabling human employees to focus on critical thinking and high value (Chang et al., 2021; Rashid & Kausik, 2024; Alli et al., 2025). Artificial Intelligence is recognized by Jia et al. (2024) as a subset of computer science responsible for development of systems that have capacity not only stimulating aspects of human intelligence but allowing business to automate complex creative tasks that once require substantial human intelligence and time. Mienye et al. (2024) also concurred with this assertion, noting AI as a branch of computer science centered on creation of intelligent agents that have capability to perceive their environment and make decisions that maximize their likelihood of successfully accomplishing their goals.

Artificial Intelligence involves creation of models and algorithms that enable machine to carry out cognitive functions including reasoning via logic and evidence, machine learning (learning from experience and data), perceiving and interpreting environment via sensory input, solving complex problem and making decision within minimal human intervention (Russell & Norvig, 2021). Supporting this view, Alli et al. (2025) and Olubukol et al., 2024) agreed that AI is an advanced machine, characterized with human intelligence or possessing potential in carrying out human cognitive functions such as adaptability, problem solving and reasoning as well as creative thinking. Olivia (2020) in his view sees AI as an advanced analysis and logical based tool (Machine Language), supporting automated decision and interpretation of phenomena, events or situations. In essence, Artificial Intelligence equips machines with the capacity to perform like humans through process and adapt their behavior over time. It can perceive human

perception, recognize speech and can translate between languages (Aladağ et al., 2024). Vital tools embedded within AI include machine learning, robotics, natural language, computer version and experts system, all which contribute to the advancement of automation and intelligence decision making across multiple domains (Aladağ et al., 2024).

From the above different definition, it is a machine, an integral part of a computer system that possesses human potential to perform multiple tasks accurately and effectively and to make automated decisions.

Generally, Artificial Intelligence can be classified into narrow AI, General AI and Super-intelligence AI (Damar et al., 2024). Narrow AI also known as weak AI is developed to handle specific, single tasks or a limited set of tasks or tasks predefined by the programmer (Frerich, 2019). They are very effective at what they are built to do and can never execute tasks that are outside what they are built for. For instance, AI systems whose function is to assist doctors in detecting diseases from medical scan, digital assistance that schedule appointments. On the other hand, General AI is an Artificial Intelligence designed to match human cognitive capacities across multiple domains. They can perform multiple or any given tasks that are asked of them, have the ability to move from one task to another and apply human knowledge across multiple fields (Frerich, 2019; Damar et al., 2024). Super intelligence AI surpasses human intelligence and capability and it is more of a goal to be accomplished (Damar et al., 2024). While Narrow AI is already widely utilized in today's health system, businesses, agriculture, education and daily life. General AI still remains the goal for the future but not yet accomplished (Moser, 2022).

The utilization of artificial intelligence in the health sector after the end of Covid-19 pandemic has rapidly increased and expanded, as it demonstrates its value, full potential and efficiency in tackling the pandemic (Bragazzi et al., 2020). For instance, AI were deployed and utilized in diagnosis such as chest X-tray and Computed Tomography scan to identify Covid-19 infections), contact tracing and surveillance, assisting health experts and authorities in predicting the spread of the Covid-19 virus. Additionally, AI strengthened telemedicine channels, which made it easier and faster for patients from remote areas to consult doctors and other healthcare providers when physical visits were restricted. AI were applied by hospitals in resource management such as predicting the demands for oxygen, ventilators and Intensive Care Unit (ICU) bed supplies. These usefulness and others showed that AI is capable of improving efficiency of health service, saving time, and supporting better decision making in healthcare. As a result, the health system has become more exposed to adopting Artificial

Intelligence. In this current global health landscape, artificial intelligence has been widely acknowledged as a game change in improving diagnostic accuracy and treatment efficiency, speeding new medicine development and discovery, predicting diseases before they become serious, optimizing medication dosage, enhancing management of large population health, establishing medical guidelines, offer virtual health assistance, enhancing patients health education, improving patient drug, safety patient-physician relationship while minimizing the therapeutic and diagnostic error, and cost (Okwukwu et al., 2025; Alli et al., 2025; Odunuga et al., 2024; Ibikunle et al., 2024; Jiang et al., 2017)

In project management context, Artificial Intelligence acts as a supportive instrument that assists managers to execute their tasks more accurately and effectively. It is a transformative technology that offers potential and capability to take over routine and automate repetitive tasks to save time and resources and minimize human errors. AI play enabling roles of analyzing large volume of dataset speedily and spotting trend that may not be obvious to human, providing predictive insight like warning when project might run out of resources or time, all which support better and faster decision making for project managers(Okwukwu et al., 2025). Within health care system, and particularly in developing countries like Nigeria, AI holds promise for solving some long standing issues and efficiencies confronting healthcare projects such as shortage of resources and medical staff, complexities of coordination large scale medical projects or program by enhancing planning, allocating resources wisely and accurately and tracking progress in real-time.

1.1.1 AI in developing economies

In developing economies, particularly African continents, AI adoption has gained significant attention as a result of its potential to solve systematic issues and transform public service delivery in strategic development sectors (education, healthcare, infrastructure, agriculture, social network, banking and other business) of their economies (UNESCO, 2021; Mienye et al., 2024; Sinde et al., 2023). For instance, in 2019, Google established its first African AI research center in Ghana with multinational scientists from different African countries like Senegal, Lesotho, Nigeria and Uganda as well as other developed countries like USA, Canada, Israel, and United Kingdom (UNESCO, 2021).

In African countries characterized with prevalence of different diseases and inadequate healthcare resources, Artificial Intelligence is the perfect solution for improving diagnosis (Oladipo et al., 2025). Eke et al (2023) reported that even though problems (such as lack of data

infrastructure, insufficient funding, poor policy), which are hindrance to AI implementation is highly prevalence in Africa, African countries like Ghana, South Africa, Kenya, Nigeria and others are taking a bold step in embedding AI into their economic activities particularly healthcare sector to offer significant change in their healthcare operation such as diagnostic support, telemedicine and disease surveillance. For instance, countries like Nigeria and Ghana are using AI in analysing climate data and traveling patterns to predict malaria outbreak, demonstrating how AI contributes to disease prediction in Africa (Tonnang cited in Oladipo 2025). This not only enables proactive measures but optimises resource allocation in addressing the diverse health challenges posed by malaria (Oladipo et al., 2025). Another good example is the adoption of AI algorithms by the South African healthcare institutions in examining chest X-tray for early detection of tuberculosis (Rajakumar et al., 2021). Additionally, the African continent is not left out in terms of AI usage in their health sector. It is being used for analyzing medical records in Ghana, overseeing medical file records in Morocco, conducting Covid-19 virus tracking in Ethiopia, and studying genomes in South Africa (Santosh & Gaur, 2022).

1.1.2 State of AI in Nigeria Health sector

Although, the utilisation of Artificial Intelligence in Nigerian healthcare institutions is still in its early stage but has continue to growth and increasingly used in performing tasks such customer service and data collection, as both the government and private sectors are investing hugely toward development of AI based healthcare solution (Alli et al., 2025). Several Nigerian healthcare institutions across Nigeria have started implementing AI based solutions to enhance health care delivery. For instance, an AI powered system capable of diagnosing breast cancers has been launched by Lagos State University Teaching Hospital. This AI system has capability to analyse mammograms utilizing machine learning algorithms to identify early signs of breast cancers. In Oyo State General Hospital, the ADISER framework has been integrated to optimize health and vaccine intervention. Wellvis, an on-demand health information and platform that link people with verified and licensed health expertise for purpose of offering health care advice and consulting services in real time, created AI powered telemedicine platform, allowing patients to consult health professionals remotely which has improved access to healthcare service, particularly in rural areas in Nigeria suffering from inadequate infrastructure. Pronov, a tele-health platform provider located in Lagos created an AI based platform that provides diagnostic testing, electronic medical record, drug prescription, patient education, chronic disease management and other health care services (Okwukwu et al., 2025). In addition to this,

the recent establishment of initiatives such as the National Information Technology Development Agency (NITDA), The National Center for Artificial Intelligence and Robotic (NACAIR), The Artificial Intelligence Research scheme, Artificial Intelligence Innovation Hub and The National Artificial Intelligence strategy workshop reflect the Nigerian government commitment to fostering Artificial Intelligence Innovation and progressiveness in Nigeria. For instance, through NITDA, the Nigerian government establish, National Artificial Intelligence Policy (2023), outlining strategic framework, for AI progressiveness, capability building, and ethic guideline, identifying healthcare as one of the critical sector where AI can facilitate project efficiency, project failure reduction and enhanced service delivery.

AI in healthcare market according to Artificial Intelligence in Market Analysis is expected to experience substantial development, rising from 0.01 billion dollar in 2022 to 0.13 billion dollar by 2030, demonstrating a notable compound annual growth rate of approximately 46.3 per cent (Science for Africa Foundation, 2025; Okwukwu et al., 2025). The development will be driven by increasing investment and AI and availability of AI solutions. While the benefits of AI have been clearly seen in advanced nations like the United Kingdom, United State of America and others, fully integrating AI into the healthcare system can substantially transform how medical service is offered, how diagnosis are carried out and overall healthcare outcome in developing countries like Nigeria. Thus, it is expected to bring about enhanced and standard health care available to Nigerians. The integration of AI in Nigerian healthcare system could prove transformative since it has capacity to enable accurate diagnosis, digitalization of treatment and disease management (proactive diseases detection), automating laboratory processes, supporting clinical research streamline workflow and minimizing administrative burden, empowering informed decision making and intervention, saving cost and optimizing resources, improving overall efficiency in health care delivery and keeping Nigerian healthcare at forefront of digital transformation (Science for Africa Foundation, 2025; Robinson, 2020). However, the increasing creation of AI based solutions, combined with government and private sector effort (investment) toward advancing AI are projected to compel full integration of AI into the Nigerian healthcare system in the coming years.

However, the utilization of AI in Nigeria heath system come with some critical challenges such as infrastructural problem like poor network connection, limited funding, unstable electricity, ethical concerns surrounding patient's sensitive data (data misuse, privacy concern), low research capability and weak integration into healthcare project management practices, hindering smooth operation of AI system. In support of this view, Science for Africa Foundation

(2025) reported that challenges such as shortage of skilled AI expertise, inadequate infrastructure especially in remote areas, limited access to quality healthcare data and lack of clear regulatory framework (concern about data privacy and accountability) are hindrance to effectiveness of AI utilization in Nigeria health care system. Additionally, purchasing, setting up and maintaining AI is highly expensive and can limit adoption of AI in public hospitals, because very few public hospitals in Nigeria have the resources.

1.1.3 Technology Readiness in Nigeria

Nigeria is one of the largest economies and most populated in Africa endowed with numerous mineral resources has potential to develop itself technologically to fully support AI adoptions into her economy (Imam, 2024). In Nigeria, notable improvement and progress have been made in terms of digital infrastructure and connectivity over the past few years. Nigeria broadband penetration increased from 32 per cent in 2020 to 43% in 2024 (Aragba-Akpore, 2024; Nigerian communication commission, 2025), demonstrating a growing foundation for digital service like AI-driven digital solutions. Major cities like Lagos, Porthacourt and Abuja host technology and innovation clusters, creating fertile ground for AI based startups including those in digital health and telemedicine. Additionally, some public and private hospitals in Nigeria have started deploying the Electronic Health Record System which creates a foundation for digital data usage in Artificial Intelligence for patient monitoring, predictive analytical and project management in health delivery. However, despite these positive development, there is significant gap in the infrastructure and connectivity as far as Nigerian contest is concern, as many rural and pre-urban areas facing issues like unstable electricity, poor internet access, low IT infrastructures, creating uneven level of readiness for adoption of AI across the country with rural and pre-rural population at the risk of being excluded from benefiting from AI adoption. Furthermore, there is a lack of high performing computer facilities and large scale data centers in Nigeria, dedicated specifically for AI development and research and with no such resources, ability to process large volumes of health related data and train complex AI models remains limited.

Several pilot projects including those in telemedicine and mobile health platform combined with establishment of National Artificial Intelligence Policy (2023), signaling the growing awareness of the importance of AI among health practitioners and the Nigerian government. While pilot projects prove that data driven solutions can improve disease monitoring, help reach patients speedily and minimize delay in healthcare delivery, National Artificial Intelligence Policy (2023) labeled healthcare as a priority area for AI usage, stressing

the need for data sharing system, standard practices and ethical rules. Even with these developments, the Nigerian data system remains very fragmented while cyber security remains weak. There is not enough protection for patient data privacy, creating risk of data compromise or leak, making patients less likely to trust or use digital health tools. Nigeria lacks a central database for healthcare information, making it difficult for AI to access large and diverse information or data needed to make accurate predictions and decisions in healthcare project management.

The large numbers of Nigeria youths showing interest in technology, contributing to the increase in software developers, data scientists and tech entrepreneurs, combined with AI and data science courses being introduced into the curricula of Nigerian Universities, indicates earlier, but positive trends towards building a knowledgeable base for AI integration in the health sector. However, while is there is shortages of health workers who have skills in AI application in medicine and health information, many of the health workers (doctor, nurse and administrator) lack based health IT training or knowledge) (Okwukwu et al., 2025), thereby limiting the ability of health practitioners to adopt, manage and maintain AI system effectively.

It could be deduced from the above that while Nigeria has gone beyond mere awareness, it is still struggling to advance to a level where AI is systematically embedded across healthcare institutions nationwide. However, using Gartner's classification model, the Nigerian health sector falls within level one (a) and two (2). At level 1 (Awareness), healthcare institutions, and the Nigerian government are becoming aware of the potential of IA adoption into the health sector. This is evident in the establishment of initiatives like the National Artificial Intelligence Policy (2023) by the Nigerian government, recognizing healthcare as a priority sector where AI can be effectively leveraged. However, awareness this initiative is creating cannot automatically translate into effective implementation of AI. At level 2 (Active), there are small scale projects and initiatives like digital health platform, telemedicine and disease surveillance already employed by the health institutions in Nigeria, demonstrating potentials but lack infrastructure for scaling into broader healthcare delivery or national project management system. Based on Capability Maturity Model Integration, adoption of AI in Nigeria healthcare sector can be classified within level 1 (initial). At level one, adoption of AI in the healthcare sector in Nigeria is still in its early stage, with many projects being small, experimental and unconnected with each other, relying on outside funding. There is no single system guiding how AI should be utilized across the health sector in the country.

Both Capability Maturity Model Integration and Gartner's classification model acknowledged that AI adoption within Nigeria's healthcare sector is still very basic with growing awareness of the role of AI among health workers and government and use of small projects.

1.2 Project Management (PM)

PM is an ever evolving discipline that is adaptive and responsive to change in the business environment and new technologies like AI that influence how a project is planned, executed and completed and monitored. PM is the application of essential aspects of organization such as human skills, knowledge, to project activities to achieve the project requirement and organizational goal (PMBoK, 2017; Abyad, 2021). Evidence has proven that organizations that constantly rely and make use of project management adequately experience ninety two (92%) success rate (Cristina et al., 2024). Supporting this, corporate entities, prioritizing developing project management skills have high likelihood of accomplishing firm performance (Project Manager, 2023). This evidence demonstrates the importance of project management to every organization. Project management, particularly in the Nigerian health system, embraces a series of systematic activities, aimed at ensuring that certain healthcare projects or tasks are adequately completed within a defined parameter of budget, time and resources (Mahato et al., 2024). Project management in health care facilities aimed at optimizing institution efficiency, minimizing cost and providing answers to the needs of all stakeholders involved (Cristina et al., 2024; Olateju, 2017). This highlighted the scope of project management practice which is beyond meeting specific scope, time and quality requirements for the project.

Within the health sector, public and private health institutions deliver primary health care and chronic services, they often carry out numerous and complex tasks/projects, addressing quality requirements and medical equipment, which need exact attention, and care (Javed et al., 2022). Applying project management techniques can minimize the cost of managing these projects, providing health care and service, manage the myriad aspects of health stakeholders, grasp all the problems faced in a heath institutions and achieve successful implementation of strategic plan (Cristina et al., 2024). Thus, effective project management effectively tracks cost, budget and allocate resources, manage communication and task, document administrative system (Olateju, 2017).

Emerging health projects such as development of hospitals, vaccination programs, and digital health platforms are increasingly becoming challenging and data-driven. As a result, advanced technologies are being built or adopted to handle and process huge health related

data collected. Tools such as telemedicine platform, Electronic Health Record, and Health information System provide opportunities for integration of Artificial Intelligence. Project management AI is an incorporated machine that has the capacity to administer projects without human involvement and intervention (Adindu et al., 2025). AI tools can improve decision making, optimize allocation of resources, and solve complexities of health projects managements across the entire project lifecycle, from planning, and implementation, to monitoring and evaluation.

Similar to other projects, five major phases of project management in health related projects according to Adindu et al. (2025) and Olateju (2017) are discussed below.

After initiation where the purpose, objective and scope of the project is defined, planning is the next phase of project management, forming the foundation for health projects, where a well detailed plan is designed to enable smooth execution of the project. Here, the plan showing the timeliness, resources, and budget for various tasks as well as their dependencies are thoroughly elaborated, making sure that the process is faster, less expensive and with no waste. In this phase, scheduling and cost estimation play a vital role. Scheduling has to do with distribution of activities chronologically, with resources, date and staff being assigned to them while cost estimation helps in predicting what financial and material resources will be needed during the project. However, Artificial Intelligence can be a supportive tool, improving this process by optimizing schedules, reducing wastage, assisting in cost estimation so as to create a more efficient project workflow.

Next after successful planning is the implementation stage, involving the actual executions of the project plan by assigning tasks and coordinating resources. It is the duties of project managers to make sure executions are done according to what is in the plan to ensure quality project, cost reduction and time compliance. Artificial Intelligence can play a substantial role here by supporting risk management, automating tracking progress, and spotting deviations in real time. For example AI tools or machine language models can help project managers spot potential issues like delay and cost overrun early, allowing speedy corrective action. Once the project is executed completely, the focus shifts to operation and maintenance which is the last phase of project management. This phase of project management ensures that the projects continue functioning, remain safe and sustainable throughout their lifecycle. However, preventive and corrective maintenance are very crucial in this phase of project management. This process can be improved by adoption of artificial intelligence, by enabling predictive maintenance of medical equipment and resources. This stage of project management aimed at

improving functionality, efficiency and sustainability of the healthcare services while reducing operational cost (Adindu et al., 2025).

1.2.1 Project management in Nigeria's healthcare Sector

The Healthcare sector has been engaged in projects for a long time but it is only recently that it began utilizing formal project management techniques. Applying these techniques can minimize the cost of providing healthcare and also manage many issues and interest of stakeholders involved (Olateju, 2017). Project management in Nigeria's healthcare is guided by at least in theory, by the five PMBok process groups above: initiating, planning, executing, controlling and closing. Some hospitals adopt these frameworks, which have improved accountability and reporting. For example, disease surveillance and vaccination campaigns are often run with clear project charter, define goal, and structure monitoring system, showing outcomes in areas like immunization, coverage and outbreak response where planning and execution were well aligned. Project management in healthcare involves the main element common to all sectors like human resources management, communication, risk management, marketing, account and finance and staying on top of project scope.

Recently, corporate entities have adopted tools such as Asena, Microsoft project, Trello, JIRA and Primavera to plan, track and manage healthcare related projects. These software tools help track cost and budgets, coordinate tasks, assign responsibilities, share resources across projects, manage communication and tasks, keep records and visualize timelines. The choice of the tools depends on the manager. Some prefer easy and simple options like excel spreadsheet design for project management while others utilize advanced project management tools like Microsoft project 2010 available for individuals and large organizations (Olateju, 2017). However, their utilization in the healthcare sector is limited because they do not integrate well with hospital information systems such as Electronic Health Record; many health experts lack training on these tools, thus, adoption is swallowed and confined to donor-driven projects instead of everyday hospital management; real time analytics are weak.

The Nigerian healthcare system is still at its early stage of project management maturity as a result of several factors. Schwalbe (2013) observed that many health projects are reactive and fragmented, often planned only in response to emergencies such as disease outbreak. For instance, during Covid-19 outbreak, the Nigerian health institutions scrambled to set up isolation centers and testing programs without standardized protocol (Aiwerioghene et al., 2024). Imma (2024) is of the view that project management tools such as Microsoft project, Trello, JIRA and

Primavera are poorly integrated into and underutilized in Nigeria healthcare sector. He noted further that digital project management remains mostly donor driven with few health institutions systematically utilizing tools for resources tracking, task assigning and real time analytics. Eke et al. (2023) in their submission, project coordination is largely handled by clinicians, lacking formal training due to shortage of skilled project managers. Also these factors reflect that healthcare project management maturity is at standardized or common language level. According to the Organizational Project Management Maturity Model, at standardized level, basic project management practices such as planning, scheduling, resources allocation and monitoring exist but are inconsistent in projects resulting in variability in project results. Kerzner's project management model asserted that project management is at common language level when there is basic weakness of project management concept but projects are still handled inconsistently

1.3 Current state of project management practices within the Nigerian health sector

In almost every sector of Nigeria's economy, health sector inclusive, PM in Nigeria is still characterised with traditional practices in spite of transformational opportunities brought by advanced technology like AI as well as digitalization. (Adindu et al., 2025). Project management within Nigerian health sector is a complex process that features five unique characteristics:

In Nigeria, most health related projects heavily rely on labour (human resources), with labour cost consuming a huge portion of the project budget. However, the demand for skilled healthcare workers has continued to rise, creating a strong need for continued training and potential building programs to ensure adequate skill and healthcare service delivery. In response, the Nigerian health sector is currently and increasingly integrating digital health tools and innovative technologies to minimize dependency on unskilled labour, enhance efficiency and productivity as well as ensure quality healthcare service.

Health related projects, although well planned are often vulnerable to unexpected change during implementations. However, factors such as government policy shift, disease outbreak, financial set back, community related challenges and other scope may change the project plan. Thus, project management in health institutions in Nigeria needs a flexible approach that enables timely adjustment to ensure projects remain relevant and responsive to current healthcare demand across the country.

Another characteristic of project management within Nigeria's health sector is its complexities which may arise from human factors involved in implementation or nature of health

intervention (Oluteju, 2017). Health related projects typically aimed at addressing sensitive and urgent demands (controlling epidemic, improving medical equipment, improving access to essential medicine). In trying to achieve this goal, unexpected challenges frequently emerge, making project executions far complicated. For instance, problems like insecurity situations (communal conflict, banditry and insurgency) in certain regions in Nigeria can hinder project activities, movement of health workers and quick delivery of medical supplies. Similarly, health projects risk facing delays where the infrastructure and supply chain are weak. The demand for utilization of advanced technologies such as telemedicine, digital health platforms and electronic health records added additional layers of complexities. Although, these innovation, promised enhanced efficiency and data driven decision making, they are also accompanied with challenges (high cost, low digital literacy among health workers, cost for cyber-security measure and limited internet penetration in rural areas), Furthermore, health project is multidimensional, involves different stakeholders such medical experts, NGOs, government agencies, community stakeholders, foreign donors. Interaction among these diverse groups can create collaboration and coordination difficulties as a result of differences in priorities and interest, resulting in complexities.

Health related projects in Nigeria are inherently exposed to a great uncertainty. From estimation of the timeline of completion to budgeting and allocation, unpredictability remains a critical and constant challenge. Inadequate or delay in government funding, corruption, unstable government health policy, persistent security issues, strike by health workers, weak infrastructure which are common to the Nigerian health sector (Anyika, 2014) can add a further layer of uncertainty to project executions and management.

1.4 Roles of Artificial Intelligence (AI) tools in enhancing project management (PM) within Nigerian public health institutions?

Generally, the role of AI in project management is rapidly increasing as the technology becomes more integrated into tools, methods and systems used by project managers daily. In the field of PM, AI remains a powerful tool that has profoundly influenced PM, by automating routine tasks, improving risk management, resulting in total change in the way projects are planned, organized and executed (Duica et al., 2024). It augment human potentials capable of assisting project managers in administration of different tasks within limited available resources, providing them with useful tools and data for predicting the scope, budget and success or failure of project, allowing managers to create preliminary schedule and automatically allocate material resources for making accurate decision (Nobre, 2020: Rio-Jaenne). Artificial Intelligence and

project management are connected as both support accurate decision making, problem solving functions, effective allocation of resources, improved analysis of large volumes of data and adequate distribution of tasks, resulting in reduction in project failure and minimization of risk (Adindu et al., 2025). It was reported by PwC that about fifty four percent (54%) of firms adopting and integrating AI into their project management has witnessed a substantial transformation and increase in operational efficiency, most especially in enhancing projects tracking potentials and automating repetitive tasks while forty three per cent (43%) of these firms documented that leveraging Artificial Intelligence has fostered improvement in their decision making process, allowing project managers to make informed choice based on Artificial Intelligence driven insight instead of gut instincts. 2023 PIM Annual Global survey on project management reported that approximately twenty nine per cent (29%) of project management experts are regularly utilizing AI tools in their project while roughly eighty two per cent (82%) leaders predicted that AI will have influence on project management at their organization in the next 5 years (Me & Smith, 2024). These above statistics demonstrate that companies embracing Artificial Intelligence are not only actualizing better project results but strengthening and positioning themselves to remain competitive in the fast paced global marketplace.

In today's health system, the complexities attached with managing health related projects has rapidly increased as a result of many connected factors including globalization, advancement in medical technologies, partnership between Nigerian health agencies and international agencies, increasing demand for efficient and effective health care delivery. In Nigeria, health related projects usually involve diverse stakeholders including doctors, government agencies, international donors, community groups and non-governmental organizations, working jointly across different regions, sometimes with limited resources and tightened deadlines. This combined with pressing pressure on Nigerian health care institutions, particularly public Hospitals in Nigeria to improve health care service delivery, response quickly to public health emergency and accomplish national and global health targets have brought about urgent and strong need for more effective project management practices/methods that ensure projects are delivered timely, within budgets timely and with high quality health outcome.

Before now, project management in Nigeria, most especially in the health sector, has heavily relied on professional experience and human judgment. Conventional tools such as Gantt chart, critical path method and methodologies such as agile or waterfall are utilized by project managers to organize, monitor and track project progress (Olateju et al., 2017). However, these tools and methodologies are no longer sufficient to manage the complexity and

velocity of modern health projects. For instance, project managers within health sector found it challenging to predict risks, track resources, and coordinate activities across different states in Nigeria during period of Covid-19 pandemic due to over reliance of the Nigerian health system on conventional project management tools and framework (Okwukwu et al., 2025).

Existing studies confirmed that automation of administrative and repetitive tasks remains one of the key contributions of AI to project management (Me & Smith, 2024; Felicetti et al., 2024). Administrative tasks like scheduling meetings, updating project timeline, assigning tasks, tracking progress and generating reports for managers are not only time and resources consuming for project managers, but can bog down project managers and team members. AI powered systems can help project management professionals overcome these heavy manual, tedious and time consuming tasks through automation, allowing staff to prioritize patient care, save time and minimize error (Jain et al., 2018; Me & Smith, 2024). For instance, AI can generate, project plan, project update, track process and alert on issues as well as document (reports invoice) based on predefined data source or template. AI powered tools like Chatbots are capable of handling these tasks automatically, allowing project managers to focus on high-level strategic activities like stakeholders management and ensuring project aligning with business objectives as well as strategic decision making (Ogunbukola et al., 2024; Felicetti et al., 2024). AI Algorithms can automate these tasks by analyzing the current workload of team members, their availability and historical performance. AI powered Chatbots are increasing been utilized in project management environment to handle basic queries, offering speedy response to questions about task, project timeline, minimizing workload on project managers and team members, revolutionizing how project managers communicate with team member and other stakeholder, ensuring that real time information is accessible for stakeholders involved (Kaplan & Haenlein, 2019). According to Felicetti et al. (2024) integration of Chatbots itself into project management is a revolution. In the health care system, Chatbots can take care of many office and paper related tasks such as keeping track of medical records, booking of appointments for patients, handling of billing, that usually slow down health workers. This can help doctors and nurses focus on other important tasks rather than paper work.

Another benefit of Artificial Intelligence to project management is that it possesses the features that can analyse large volumes of dataset, predict project outcome, and allocate resources efficiently, enabling project managers to focus on strategic decision making and leadership (Ogunbukola et al., 2024). By handling and analyzing large historical project data in real time, AI can be of help to project managers in identifying trends and patterns, predict future

occurrence (likelihood of meeting deadline and of staying within budget time), foreseen bottlenecks through Machine Learning that would not have been possible for humans to detect. In the context of healthcare system, AI powered predictive model are capable of analyzing patients data (demographic details, genetic information, laboratory test results, and electronic health records) to predict and detect chronic disease earlier and more accurately or spot patients at risk for conduction such as cancer, heart diseases and diabetes, enabling early intervention, enhancing patients outcome, minimize burden on health care system and improving decision making (Coronator et al., 2020). Thus, Artificial Intelligence can analyse large volumes of historical hospital and health project related data to forecast and identify potential problems long before they occur or become critical. For example, accurate prediction and early detection of likelihood of shortage in essential health practitioners, hospital equipment breakdown and disruption in supply of medicine through AI systems, enable project managers and health administrators to take timely corrective and preventive measures/actions capable of minimizing delay, avoiding costly emergencies and preventing hospital failure. Application of AI is assisting Nigerian hospitals and health projects perform smoothly and effectively by making daily tasks easier and allocating and utilizing resources optimally. More advanced AI tools (Machine Learning algorithms) can be applied in studying historical hospital data for the purpose of predicting future needs with greater accuracy. They can help in estimating expected number of patients, number of hospital beds needed, number of staff that should be on duty as well as tracking the use of medicine supplies and suggesting when to re-order. This in turn health hospitals avoid overcrowding, shortage of important equipment and staff.

Artificial Intelligence does not just render assistance to project managers, it typically transforms how projects are managed, supporting superfast but accurate human decision making (Barcaui & Monat, 2023; Adindu et al., 2025). Project management professionals in charge of health related projects can utilize AI to augment their human intelligence and judgment with AI and data. For instance, stimulations, alternatives, scenarios, suggestions can be provided by AI to health project management professionals based on logic, data and rules as well as explain justification or rationale behind the recommendations (Me & Smith, 2024).

Integration of Artificial Intelligence also supports improvement in risk management which is a critical area of concern for project managers. Risk management is an important component of project management because project management often involves many risks and uncertainties. However, Artificial Intelligence can help in mitigating these risks via predictive analytics (Ogunbukola, 2024). By studying past project data, Artificial Intelligence predicts,

detects and responds quickly to possible problems (delay, shortage of resource), allowing early intervention of project managers to adjust plans, and reduce the chance of project failure. Through the utilization of machine learning algorithms and predictive analytics, early risks in the project lifecycle can be detected, enabling project managers to take proactive decisions in mitigating those risks. For instance, with the help of AI, resources insufficient can be predicted, potential delay based on history can be pointed out and adjustment to project plan can be recommended before risk materializes, thereby minimizing the likelihood of project failure and ensuring that teams can adapt to changing circumstances more effectively. Unlike traditional approach where project managers manually assign tasks based on personal preferences or judgment, AI assign tasks based on performance of team member in the past, their current capacity and their skills (Ogunbukola et al., 2024), this however minimize the risk of over-utilizing certain team members and underutilizing others. Additionally, AI applications can be utilized to prevent risk by prioritizing risk at the project site which assists project teams focus their resources at the larger risk factors. AI tools like Machine learning can bring about prevention of conflict between stakeholders by detecting them before the project and estimating the resolution of these conflicts in cases where there is disagreement (Aladag et al. 2024).

Human error is a well recognised problem in project management. Error leads to defects, which are fundamentally deviations from original plans and should be identified and evaluated via risk probability assessment tools and cognitive model framework, therefore, error detection becomes crucial for successful project management (Oropesa, 2020). Mistakes or errors in data entry, resource allocation and progress tracking can result in costly delays, waste of resources, and project failure. Since AI algorithms can handle repetitive tasks with high degree of accuracy, AI addresses these problems by automating processes, substantially lowering the likelihood of human error. Thus, by automating and optimizing diagnostic processes using AI, mistakes and human errors are reduced which ultimately enhance overall health outcomes (Okwukwu et al., 2025).

Evidence from above has proven that AI is more than being a supplementary technology, it has become essential in managing complex and large scale projects. From task automation, predictive analytics, risk reduction, optimum resources allocation to informed decision making, Artificial Intelligence has the capability to transform how projects are planned, executed and tracked within the health system.

1.5 Challenges hindering the adoption and implementation of AI in project management within Nigeria's public health sector?

AI can offer numerous benefits for project management professionals within the health sector, but its adoption and implementation can be hindered by factors discussed below.

Successful integration of AI required robust data and digital infrastructure, this is because AI systems cannot function effectively without accurate and highly quality data and digital infrastructure. Thus, institutions or sectors that have not yet invested in such infrastructure may struggle to enjoy the full benefit of an AI system in project management. In the context of the health system in Nigeria, inadequate digital infrastructure remains a fundamental challenge. Many health institutions in Nigeria such as general hospital, clinics still lack digital medical records because they rely on paper based data, making it challenging for implementing AI driven electronic health records or predictive analytics (Okwukwu et al., 2025). Additionally, inadequate internet connection, unstable electricity and absence of advanced computing resources further hinder the adoption of AI technologies in project management within Nigeria public health system (Robinson, 2020). AI application in project management needs high performance computing and cloud storage which are either unavailable or unavoidable for many public health institutions in Nigeria. Thus, without significant investment in digital investment AI adoption into project management will remain limited to few well founded health institutions.

After inadequate infrastructure, the next data quality and data availability (Wang et al., 2022; Veera, 2024). We all know that data is very important when it comes to Artificial Intelligence systems, they need large and quality data to function, train and improve their models. Unfortunately, Nigeria's health system is characterized with poor data collection and management systems, resulting in inconsistent and inaccurate dataset storage. Many public health institutions lack centralized digital data and data collection approaches varies across different health institutions (Okwukwu et al., 2025). However, utilizing inconsistent data can result in poor and unreliable prediction, poor health service delivery and poor allocation of resources.

In a country like Nigeria where there is weak data protection framework, poor IT infrastructure and inconsistent enforcement of Nigerian Data Protection Regulation, Hospital and patients data can be susceptible and vulnerable to security risk, breaches and unauthorized access (Ezemerihe et al., 2024; Okwukwu et al., 2025). Many African healthcare institutions, particularly Nigeria, lack secure networks, exposing project management tools used in Hospital hackers to obtain sensitive patient information (Oladipupo et al, 2024). This cannot only jeopardize the hospital's reputation but reduces the trust in Artificial Intelligence technology.

Thus, without robust cyber security measure, consistent enforcement and regulation in Nigeria, health institutions in Nigeria may be reluctant in adopting AI system

Another challenge hindering adoption and implementation of Artificial Intelligence project management, particularly in the African healthcare sector is ethical concerns (Ali et al., 2025) and biases in AI model, challenging transparency and accountability of Artificial Intelligence system in decision making. Many of the AI systems are not created in Nigeria but are developed in Western World, therefore they are trained using Western dataset or other data that may contain biases, or may not adequately represent the Nigerian diverse population, resulting to biased prediction and unequal project outcome like misallocation of resources or inadequate planning for health service (Okwukwu et al., 2025). AI diagnostic systems trained using Western data may fail to spot disease common in Nigeria. Additionally, since Artificial Intelligence relied on individual data, AI powered projects could assign tasks to team members based solely on race, gender and other bias criteria which may bring not only negative effects on team performance but unequal health outcomes. In addition to this is the transparency issue. It may be challenging for health professionals, project managers and other stakeholders to really understand how AI makes decisions, lowering trust in AI technology.

Using Artificial Intelligence and Machine learning needs professionals in programming, data sciences and those with other IT knowledge. However, there is severe insufficient skilled expertise, capable of developing, deploying and managing Artificial Intelligence system in Nigeria (Ogunlana & Olajumonke, 2019; Okoroafor et al., 2021; Abdulkadir et al., 2024; Okwukwu et al., 2025). Okwukwu et al., (2025) submitted that the Nigerian education system does not encourage widespread training in AI for healthcare and there are low opportunities for expertise to gain hands- on experience in AI driven healthcare research. This results in health care workers like doctors, nurses and others not being equipped adequately with digital literacy and lacking adequate training and knowledge required to integrate Artificial Intelligence into their workflow effectively. This however hinders adoption and implementation of Artificial Intelligence in project management within the Nigerian health sector. Tambe et al (2020) suggest an awareness and comprehensive training program for health professionals to enable effective engagement with AI which by extension will improve project management practices in Nigerian health institutions.

The last challenge is the high cost of implementation of Artificial Intelligence. Studies like Ali et al (2025) identified this as one of the key barriers of AI application within healthcare institutions in Nigeria. Ogunbukola (2024) stressed that implementing Artificial Intelligence

technologies is not an easy task, it requires huge and upfront investment, both in terms of finance and the time needed for training. Supporting this view, Okwukwu et al. (2025) noted that AI models need significant investment in both software tools and hardware tools (like cloud computing services and GPUs), for them to service their purpose, which can be costly. Acquiring AI powered software, medical equipment, necessary computing infrastructure combined with resources needed for training, is prohibitively high for most Nigerian health institutions, particularly public ones. In addition to this, keeping the Artificial Intelligence system working effectively needs constant or continuous maintenance and upgrading, cybersecurity measures, safe data storage, all which add to the long term financial burden. Most Nigerian public health institutions already operate on limited budgets, therefore adopting and implementing Artificial Intelligence in their project management practices can be too expensive for them unless they receive financial support from outside sources. Chung et al. (2021) also highlighted that resources constrained institutions have been very slow in implementing AI training hindering health workers' ability to fully leverage AI potentials.

1.6 Conceptual Model

Figure 1 *Conceptual Model*
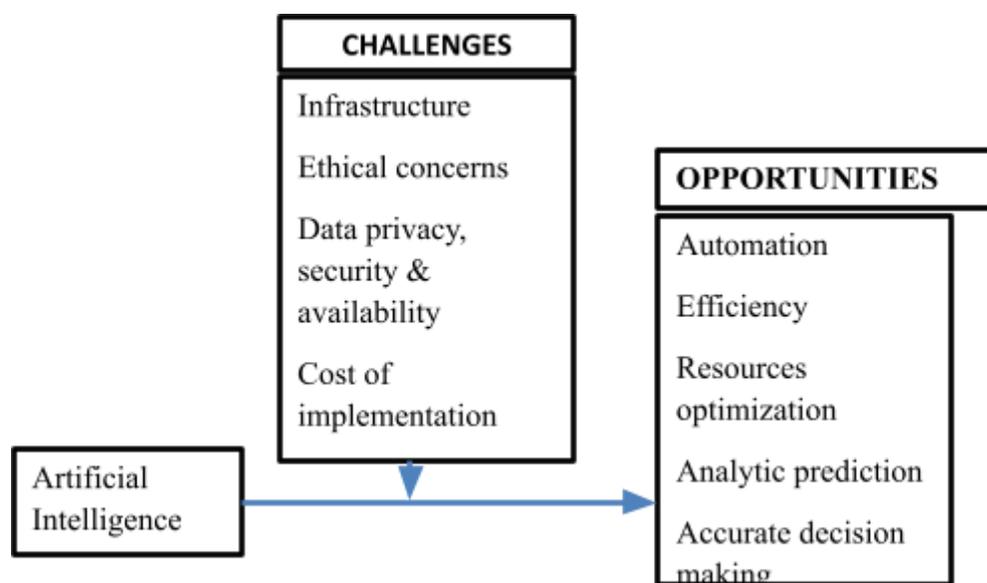
Source: (Computed by the Researcher, 2025).

Figure 1 illustrates opportunities and challenges of adopting AI into project management practices. From the literature, adopting AI into project management practices in the healthcare system offers opportunities such as Automation efficiency, resources optimization, analytic

prediction and accurate decision making. Meanwhile, the key challenges identified from the above literature review include infrastructure ethical concerns, data privacy, security & availability, cost of implementation.

1.7 Theoretical Perspective

This study draws on theoretical frameworks that explain both the adoption of new technologies by individuals and the strategic use of resources by organizations. The Technology Acceptance Model (TAM) (Davis, 1989) was selected as the primary anchor because it provides a clear framework for understanding why healthcare project managers may accept or reject AI tools, focusing on perceived usefulness and ease of use. To complement this individual-level perspective, the Resource-Based View (RBV) (Wernerfelt, 1984; Barney, 1990) was also included, as it frames AI as a strategic organizational resource that can provide competitive advantage if effectively deployed. Together, these theories ensure that the research addresses both micro-level adoption dynamics and macro-level organizational implications, providing a comprehensive theoretical basis for the conceptual model presented in Fig. 1.4.

1.7.1 Technology Acceptance Model

Technology Acceptance Model developed by Davies (1989) describe the causes of acceptance of technology and include five essential factors such as attitude toward use, actual use, behavioral intention, perceived usefulness and perceived ease of use (Martin, 2022). Technology Acceptance Model highlighted that the adoption of AI into project management practices within the health sector depends solely on whether project managers and other health workers find it useful for solving problems associated with traditional project management approaches and easy to utilize without creating additional burden (Ma & Liu, 2025). This theory acknowledges the fact that technological tools like Artificial Intelligence have both benefits and challenges that can influence the performance of project managers. Thus, its utilization and adoption is based on how users (project managers) perceive them to be useful and easy to use. Conceptually, AI applications have been confirmed to serve multiple purposes, particularly in the field of project management. It is capable of predicting delays in health projects, track progress and optimize resource allocation, and improve decision making. At the same time, it can be a compromise, contain bias and be expensive to implement (Okwukwu et al. 2025; Ogunbukola, 2024). Therefore, all the stakeholders involved in AI development should ensure that problems related to AI are fixed or reduced to encourage its usage in the field of project management and other disciplines.

1.7.2 Resource Based theory

Resource Based theory, first pioneered by Wernerfelt B. (1984) and popularized by Barney. J. (1990) pointed out the importance of using critical resources and building new potential capabilities through learning, skill acquisition and accumulation of intangible and tangible assets over time (Utami & Alambaso, 2025; Dailani et al., 2024). This theory considered resources that are valuable, rare, inimitable and not-substituted (VRIN) as vital and strategic assets an institution must acquire and control for accomplishing the sustainable competitive edge (Dailani et al., 2024). Resource Based theory categorizes company resources into physical capital resources (equipment, technology), human capital resources (experience, skill, learning, intelligence) and firm capital resources (firm structure, system). Resource Based theory argues that for a company to gain competitive advantage it must possess valuable, rare, imitable and non-substituted resources. However, AI can be considered a strategic and physical resource because it meets the criteria of VRIN. AI systems can predict, identify risk and track progress in real time, all which make it valuable. Advanced AI-driven project management systems are uncommon across all health institutions in Nigeria. Therefore, health institutions that successfully implement AI into their project management practices may gain competitive advantage over other hospitals. AI systems are inimitable because they are often trained with organization information/data. Lastly, the non-substitutable nature of AI makes it a more strategic resource. Its predictive power, automation ability cannot be nonexchangeable. In nutshell, Resource Based theory sees AI systems as strategic assets that project managers can explore to strengthen project executions, particularly within the health sector. However, when it is integrated and implemented adequately, it will improve resources allocation, scheduling, risk management and accurate and informed decision making

This study is anchored on the Technology Acceptance Model, because it is centered on an individual's perspective, pointing out reasons people accept or reject new technology. According to the model, the acceptance of AI by health workers and project managers depends on perceived usefulness and perceived ease of use. Technology Acceptance Model offers a clear framework, explaining factors that influence AI adoption which is crucial in the health system while addressing the constraint to AI adoption.

1.8 Empirical Review

Ali et al (2025) explored the opportunities and challenges of AI healthcare in Akure Ondo State, Nigeria using data collected from 200 healthcare staff through questionnaires. The result of descriptive statistics revealed that AI has positive potential to improve patient care, operational efficiency and healthcare delivery. Notable barriers such as high financial cost of implementation, fear of job displacement, ethical concern, and resistance to change were identified. Similarly, Odunnuga et al (2024) in their study identified ethical concern in the utilization of artificial intelligence within Nigeria healthcare sector while also spotting drug discovery and development, diseases diagnoses, diseases outbreak prediction and personalized medicine as the benefit of medical application of AI

The impact of AI and its challenges with the African healthcare sector was investigated by Oladipupo et al (2024). In their study, it was reported that, ranging from mobile based diagnostic to precision medicine, AI has proven its capabilities and potential in diagnosing, treating and enhancing healthcare operations by offering solutions to resource constraints and accessibility challenges. They also reported challenges such as concerns about data privacy, infrastructural limitation, and a gap in healthcare professional's training serving as hindrance to realization of AI's potential in African healthcare.

Ogunbukola (2024) examined artificial intelligence and its impact on project management. The study revealed that artificial intelligence improves project management by improving efficiency, mitigating risk and improving decision making. The study identified challenges such as data privacy as the major problem hindering AI for effective project management practices.

Okwukwu et al (2024) investigate the challenges and opportunities of Artificial Intelligence application within Nigeria healthcare sectors using literature review-based approach and found AI in diagnosis, telemedicine, public health surveillances and hospital administration. The study also found that limited digital literacy, infrastructure gaps and poor regulatory framework are obstacles to widespread adoption of AI within the Nigerian healthcare sector.

Alaran et al (2025) did a study on challenges and opportunities of AI in the African healthcare sector using literature review –based approach and documented that AI has potential to transform diagnosis, productivity, resources allocation and disease surveillance. The study suggested that for Africans to fully realize the benefit of AI, there is need for strict data privacy and security control, infrastructural integration, and ethical guidelines to ensure AI decisions match with medical standards and patient autonomy.

Adediran et al (2024) in their own study identified several obstacles such as deficiencies in infrastructure, lack of people with AI skills, notable ethical and legal issues, obstructing the potential, integration and execution of AI in Nigeria. The study suggested many further action inclosing investment in digital infrastructures, improving AI education and training program, developing strong regulatory framework

In a study conducted by Peteson et al (2022) in Sweden. Healthcare leaders were qualitatively interviewed on challenges of implementing artificial intelligence in healthcare using semi-questionnaire. The findings categorized the challenges into conditions external to the healthcare system (factors outside the control of healthcare organization such as policies, law), capacity for strategic change management and transformation of healthcare workers and healthcare practices.

Hosseini (2024) investigated the role of AI in transforming project management, focusing on predictive automation and stakeholders engagement. The study found that AI applications like Custom Generative Pretrained enable task automation, unlock operational efficiencies, improve communication across diverse audiences, optimize decision making and foster strategic innovation in project delivery. Also, data privacy, algorithm bias and ethical issues were the key challenges of AI adoption identified.

Bharati and Sandbrink (2024) examined the implementation of Artificial Intelligence in project management, specifically centered on workers in Europe and India. The study employed both qualitative (literature and semi-questionnaire interview). The study revealed that AI impacted project management by reducing workload, facilitating better decision making, and fostering access to insightful data through AI-driven analytics. However, ethical issues, such as data privacy, algorithm bias, and decision making transparency as the problem associated with AI adoption.

1.9 Gap in the Literature

From the above literature, several studies have attempted to investigate how AI adoption serves as project management assistance within the healthcare sector, particularly in Nigeria. While most of the studies (Odunnuga et al., 2024; Oladipupo et al., 2024; Ogunbukola, 2024); Okwukwu et al., 2024; Alaran et al., 2025; Adediran et al., 2024) were literature review based studies; few of them (Ali et al., 2025) employed only quantitative approach. However, this present study intends to employ both qualitative and quantitative methods to practically

investigate opportunities and challenges of AI toward project management practices within the healthcare sector in real time.

2. METHODOLOGICAL APPROACH

2.1 Research Method

The purpose of this research is not just to explore how AI adoption improves project management practices in Nigerian Healthcare institutions but to gain an in-depth understanding of AI implementation and how it has helped project managers within this context in performing their tasks or duties effectively. This study employed a triangulation research approach, which enables utilising both quantitative and qualitative approaches simultaneously to gather in-depth data from the participants for comprehensive understanding. Triangulation supports integration and deployment of various research approaches to explore the sample research objectives or addresses the same research problem for strong findings validation (Madugu & Ibrahim, 2024). In this study, both quantitative data and qualitative data were sourced from the participants using survey and semi-interview respectively and were analysed concurrently using adequate analytical techniques to identify similar or difference insights. Also, this mixed approach enables us to balance the weakness or shortcomings of one approach with the strength of the other. Thus, findings from quantitative data were validated through findings from qualitative, thereby enhancing the credibility and quality of this research

2.2 Research Design

Convergent parallel design was the research design adopted in this research. Convergent parallel design allows using both quantitative and qualitative approaches to collect data simultaneously and independently, analyse data separately and then merge the result to see how they align or contradict each other (Adikhari, 2024). Hence, convergent parallel design supports triangulation. With this research design, each data gathered was analysed utilizing a method suitable for it. That is, thematic analysis was used to analyse data collected through interview while descriptive statistics (percentage and mean) and inferential statistics (simple linear regression) were used to analyse data collected through survey. Thus, this approach enables us to triangulate findings for strong validity, provide details or deeper understanding of how AI adoption improves project management practices within Nigerian healthcare institutions and then make comparison between what participants highlighted in the interview and what respondents report in the survey.

2.3 Research Population

The population of this research comprises administrator, project managers, data scientist, IT specialists and health workers working in the selected Nigerian healthcare institutions. However, the exact total number of these people currently working within the Nigerian healthcare system is unknown as a result of lack of comprehensive data.

2.4 Sample and sampling Technique

In this research, judgmental sampling techniques were used, supported by snowball sampling techniques to recruit participants. Both judgmental and snowball sampling techniques are non-probabilistic in nature, supporting selection of participants by the researcher based on criteria and not random (Makwana et al., 2023). However, using judgmental sampling techniques, participants who are project managers, have some exposure to AI utilization and IT specialists in Nigerian healthcare institutions were deliberately selected. Since the integration of AI into PM practices in Nigerian healthcare institutions is still at an early stage of development, only project managers and IT specialists working in Nigerian healthcare institutions could offer accurate and reliable insights. Thus, it becomes necessary to deliberately target project managers and IT specialists working in Nigerian healthcare institutions to provide detailed and reliable responses on how AI adoption has shaped activities of project managers within Nigerian healthcare institutions. Therefore, snowball sampling technique was utilized by first contacting a few of the participants (project managers), working healthcare institutions in Nigeria after which they were asked to refer to other eligible project managers working within their organization or in other Nigerian healthcare institutions. Those new project managers recommended by the initial participants further recommend others. Thus, this referral process continues until 44 participants are selected. Snowball sampling technique is suitable for this study because it enables access to project managers and IT specialists working in Nigerian healthcare institutions who might otherwise not be accessible.

2.5 Research Instruments

To support the mixed method approach (qualitative and quantitative method), questionnaires and semi-interview were employed to extract in-depth and comprehensive data from the sampled research participants. Out of 44 participants, thirty eight (38) were chosen for the survey and 6 for the interview. The surveys were sent to the participants electronically, through email. The survey includes close-ended items and is measured using a five point likert scale. The reliability of the survey was ensured through several measures. The survey was designed using clear and un-ambiguous items and was sent to a research expert (thesis supervisor) for suggestions and proper scrutiny, which helped in improving the consistency of

the instrument. Six (6) participants who had deeper understanding and knowledge of AI and project management activities in Nigerian healthcare institutions were chosen for semi-interview to gather in-depth qualitative data. The interview was done through Google meet, while the detailed note was taken and the audio recording was utilized to capture responses of the participants accurately, minimizing the risk of omission. The interview transcript was properly checked with the audio recording to ensure accuracy. The adoption of both questionnaire and interviews ensure reliance of the study not only on numerical data but also perspectives of the participants on AI and project management practices, which strengthen the validity and credibility of the research.

2.6 Technique of Analysis

Extracted data from the participants through survey were analysed using percentage, mean, and regression analysis. While percentage and mean were utilized to summarize the characteristics of the participants and variables of the study, hypotheses formulated were tested using linear regression analysis. On the other hand, the data collected through semi-interview were analyzed using thematic analysis to identify recurring patterns, group them into main themes and sub-themes, reflecting the perspectives of the participants. Hence, both qualitative and quantitative approaches were employed for data analysis. Utilizing mixed approach ensure a more comprehensive interpretation of findings and understanding of the role of AI as project management assistance within Nigerian healthcare institutions, there improving the validity and robustness of the conclusion drawn

2.7 Ethical Consideration

The data collection from the respondents was done in strict accordance with the ethical standards of Vilnius University. The following protocols were implemented to ensure the protection, dignity, and rights of all participants:

- Informed Consent: All the participants were first informed about the purpose of the study before the data collection stage, the reason for data collection and the procedure involved. All the participants were clearly informed about their right to participate or decline participating in the research or withdraw at any point of the research without any penalty or consequences.
- Anonymity and Data Privacy: All participants were assured of their data privacy and protection. Thus, all the identifying information like name, Gmail address, and other personal details collected during questionnaire and during the interview that could reveal

the identities of the participants were anonymised. The transcribed responses (data) were coded in the analysis and reporting to ensure anonymity so that the identity of the participants are unknown.

- Protection from Harm: Furthermore, in order to protect the participants from being harmed physically or psychologically, ambiguous questions or questions that bring discomforts and embarrassments to participants were not used in both survey and semi-interview. Participants were given freedom to skip any question they feel uncomfortable answering.

3. DATA ANALYSIS AND DISCUSSIONS

This section covers the analysis and presentation of data collected from the participants of this research as well as results obtained. Response was gathered from 44 participants (38 through questionnaire, 6 through semi-structured interview).The data collection process was conducted over a five-week period in late 2025 in the selected Nigerian healthcare institutions.

3.1 Data Analysis

Table 3.1

*Demographic information of Survey Participan*ts

Variables	Frequency	Percentage
Gender		
Male	23	60.5
Female	14	36.8
Prefer not to say	1	2.6
Total	38	100
Age		
25 - 34 years	16	42.1
35 – 44years	11	28.9
45 years and above	6	15.8
Less than 25 years	5	13.2
Total	38	100
Educational qualification		
ND/NCE	1	2.6
HND/BSC	24	63.2
MSC	8	21.1
PHD	5	13.2
Total	38	100
Position		
Administrator	8	21.1
Data Scientist	1	2.6
Health worker	10	26.3
IT officer	5	13.2
Others	1	2.6
Project manager	13	34.2
Total	38	100
Institution		
General Hospital	13	34.2
Logistics and IT	1	2.6
Primary health Center	12	31.6
Private Company	1	2.6
Private hospital	10	26.3
University	1	2.6
Total	38	100
Years of experience		
10 -15 years	4	10.5

Continuation of Table 3.1

	5	13.2
15 years and above		
5 – 9 years	13	34.2
less than 5 years	16	42.1
Total	38	100
Involve in Project management		
Yes	38	100
No	0	0.0
Total	38	100

Source: (Computed by the Researcher, 2025)

The demographic information of the 38 participants sampled for this study were presented in Table 3.1. Based on the response of the participants, the majority of the participants (60.5%) were male, implying that male health and project management professionals dominated the selected Nigerian healthcare. The demographic analysis shows that 42.1% of participants were between 25 and 35 years of age. Within the context of this study, this suggests a high representation of early-to-mid career health professionals and project managers. Regarding the job position, the majority of the participants (34.2%) featured in this survey were project managers while others include health workers (26.3%), administrators (21.1%), IT officers (13.2%, and data scientists (2.6%). Majority of participants (34.2%) are staff from General Hospital, 31.6% of participants are staff from primary health care, 26.3% of participants are private hospital staff while the remaining 5.2% are staff from logistic and IC companies. Lastly, most of the sampled participants (57.9%) of participants have spent 5 years and above working in their current organization while the remaining (42.1%) have spent less than 5 years in their current organization, meaning experienced participants in terms of project management dominated. In link with results, all the participants have taken part majorly in project managements such as public health campaigns and outstretch (28.9%), research and clinic trial projects (21.1%) and patient improvement initiatives (13.2%). Others include health information system implementation, staff training and development program, quality improvement and accreditation project, infrastructural development project and medical equipment procurement and implementation. The involvement of all the participants in project management, guaranteeing valid and reliable information on AI adoption and project management from them.

Having established the demographic information of the surveyed participants, the research proceeds to analyse AI application in healthcare project delivery in Nigeria.

Figure 3.1: *AI Usage in healthcare project delivery*
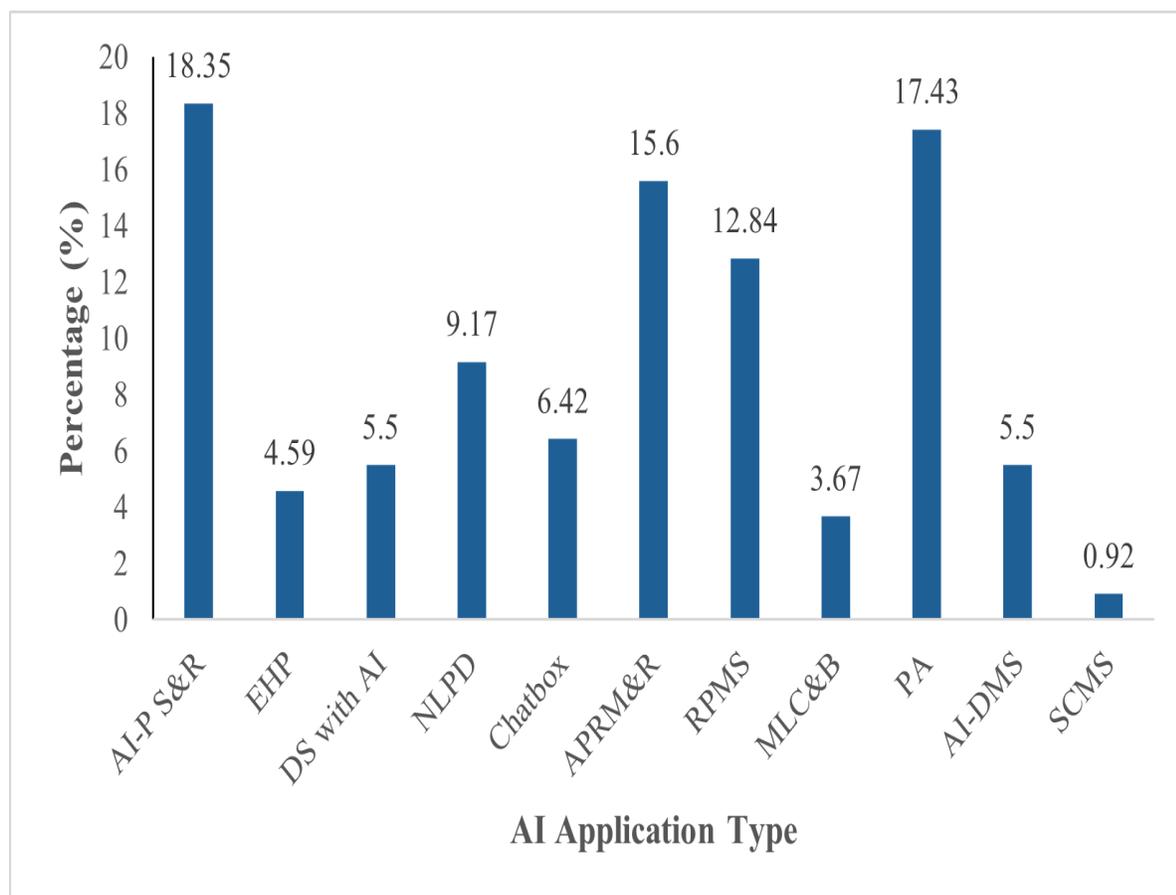
Source: (Computed by the Researcher, 2025)

Figure 3.1 presents AI applications currently being used in healthcare related projects in Nigeria. The result revealed that 18.4% of the AI applications are AI-powered scheduling and resources allocation (AI-P S&R), closely followed by predictive analytics for patient flow or resources planning (PA) and automated project progress monitoring and reporting system (APRM&R), accounting for 17.4% and 15.6% respectively. This implies that AI-powered scheduling is the most used AI tool within the selected Nigerian healthcare institutions. Other applications include risk prediction and management system (RPMS) (12.84%), Natural language processing machine for documentation (NLPD) (9.17%), Chat-box for communication (6.4%), diagnostic systems with AI integration (DS with AI) (5.5%), AI enhanced decision making machine (AI-DMS) (5.5%) electronic health record with AI feature (EHP) (4.6%), and machine language for cost estimation and budgeting (MLC&B). The dominance of AI applications such as AI-powered scheduling and resources planning, predictive analytics for patients flow or resources planning, automated project progress monitoring and reporting

system and risk prediction and management system within Nigerian healthcare institution for managing health related project, suggest that AI has not only been integrated into the Nigerian health system but already playing a substantial role in enhancing planning, monitoring and execution of health related projects within Nigerian healthcare system.

Building on the types of AI applied in healthcare project delivery in Nigeria, the study proceeds to examine the level of AI integration into healthcare project management in Nigeria

Figure 3.2: *Level of AI integration into healthcare project management in Nigeria*
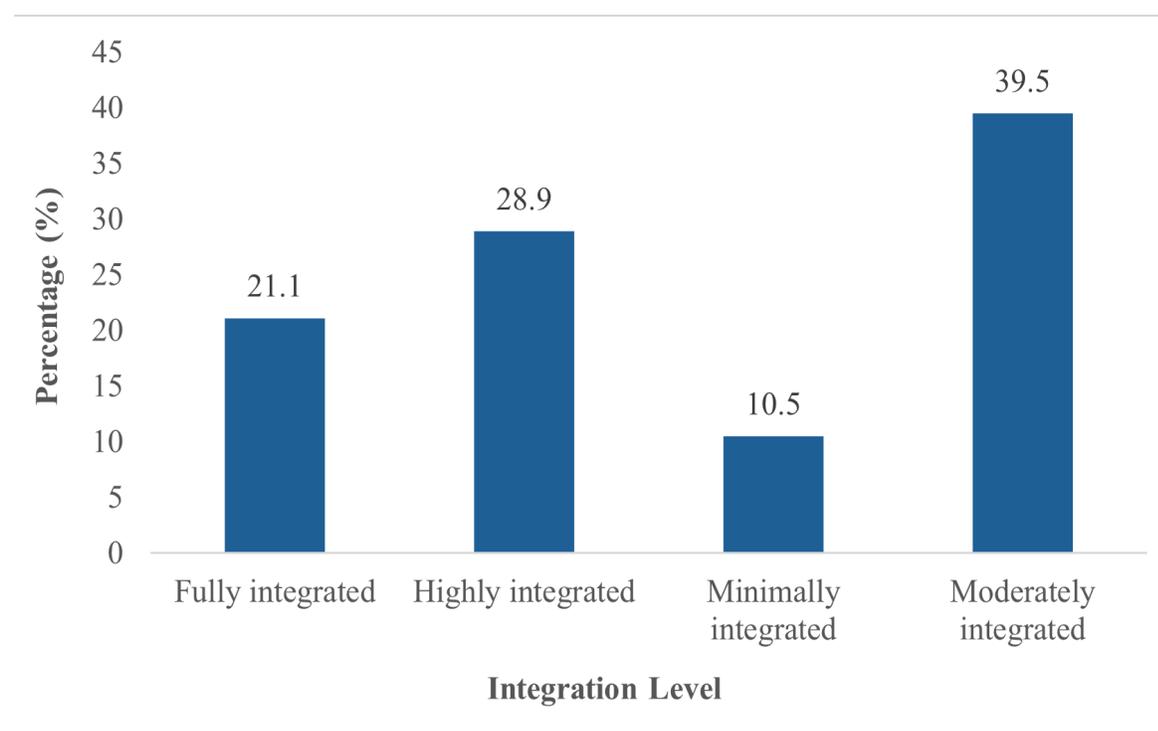
Source: (Computed by the Researcher, 2025).

Figure 3.2 presents the current level of integration of AI into healthcare project management in Nigeria. Based on the response of the majority of participants (39.5%), findings suggest that AI is moderately integrated into healthcare project management in Nigeria and only used in few processes. This is a confirmation that AI is being utilized moderately for project management, particularly project planning, monitoring and execution within Nigerian healthcare, Hence, project managers within the Nigerian healthcare system still rely heavily on traditional methods of project management.

In supporting the quantitative analysis above, data collected through interview were analysed qualitatively using thematic analysis

Main Theme: Low level of AI Integration.

From the thematic analysis, participants highlighted that AI integration into project management within Nigerian healthcare institutions is still at an early development stage. For instance, R3 noted that in Nigeria, we are still scratching the surface of AI adoption (we are still at an early development stage. Also, R4 said "AI is emerging in project management but it's starting to make a difference". In supporting this, R5 stated that "AI is beginning to influence project management". Similarly, R1 stated that "AI is gradually being introduced into the Nigeria health sector"

Sub-theme 1: Inadequate funding and poor infrastructure

Participants highlighted that AI integration into project management in Nigerian healthcare institutions is limited due to financial issues and poor infrastructure. For instance, R3 stated that "AI adoption is still quite limited because most hospitals lack infrastructures, funding and trained personnel to integrate AI effectively. R4 explained that "due to lack of better infrastructure and consistent funding, Nigeria is still far behind in term of automation and data management" R1:"We are not yet at advanced stage, but we are getting there, with more training and adequate funding, the potential is high"

Sub-Theme 2: Preference for Manual Process

The reason AI has not been fully integrated into project management in Nigerian healthcare institutions according to the participants is that most of the health practitioners and project managers within healthcare institutions prefer traditional methods or manual ways of doing things. For instance, R2 noted that "I don't think AI has been fully embraced in our area of project management yet, because large numbers of people have old or traditional ways of doing things and often resist change.

It could be deduced from the thematic analysis that AI integration into project management practice in Nigerian healthcare institutions is still very low due to poor funding, lack of adequate digital infrastructure and preference for manual process. This result is consistent with findings from quantitative findings where participants suggest that AI is moderately integrated into healthcare project management in Nigeria

RQ1: What roles can Artificial Intelligence (AI) play in improving project management practices within Nigerian healthcare institutions?

Impact of Artificial Intelligence (AI) in improving project management practices within Nigerian healthcare institutions

Figure 3.3: *Impact of Artificial Intelligence (AI) in improving project management practices within Nigerian healthcare institutions*
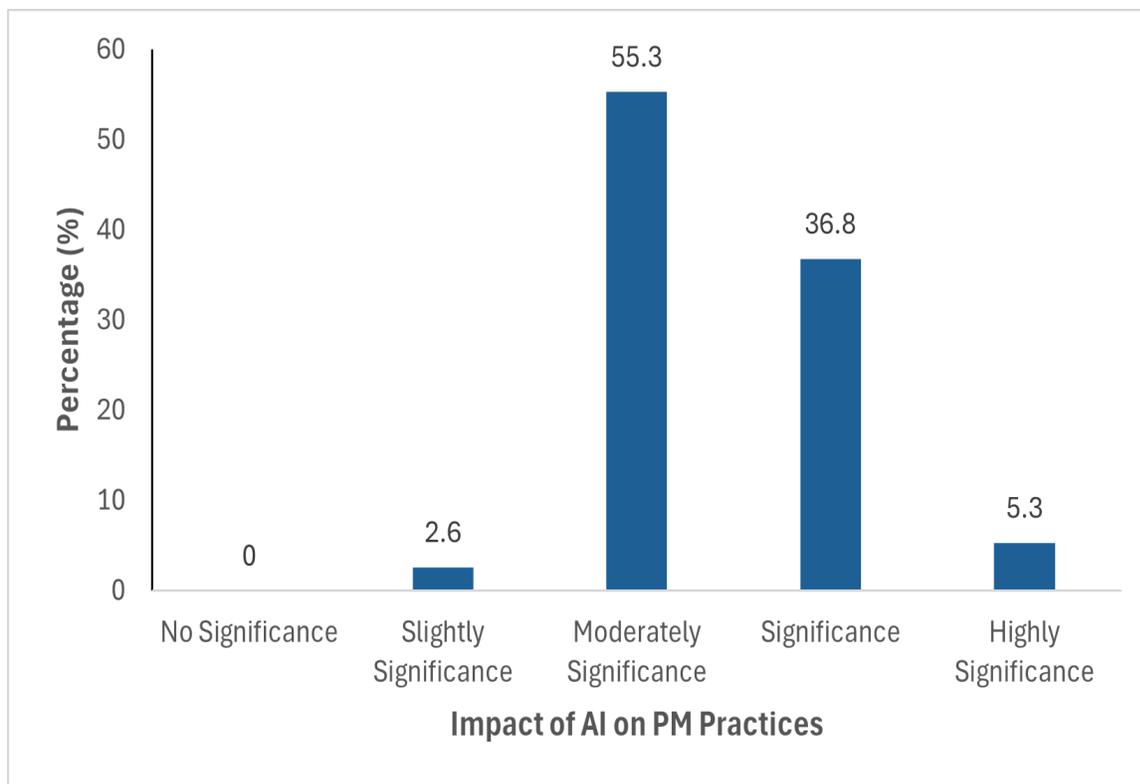
Source: (Computed by the Researcher, 2025).

Figure 3.3 presents the impact of Artificial Intelligence (AI) in project management practices within Nigerian healthcare institutions. Evidence from Figure 3.3 shows that impact of Artificial Intelligence (AI) applications on project management practices within Nigerian healthcare institutions is moderately significant as noted by the majority of the participants (55.3%). This implies that AI application is making meaningful transformation in project management practices within Nigerian healthcare institutions but the impact is limited due to factors like its low level of adoption, preventing it from being highly significant.

To analyse further the impact of Artificial Intelligence (AI) on project management practices within Nigerian healthcare institutions. The data collected from the participants were analyzed using thematic analysis

Theme 1: Accurate Planning and Monitoring

The first theme identified was accurate planning and monitoring in project management. Participants highlighted that AI adoption has fostered accurate planning and monitoring of projects in Nigerian healthcare institutions. As stated by R4 "AI helps us plan staffing better. R5 is of the view that "AI influences project management, especially in planning and monitoring". Participants (R4) cited an instance where a health information system is used to track patient inflow and identify peak service. The statement from the participants suggest that planning and monitoring are critical stages of project management because when planning and monitoring of projects are accurately done, timely completion, cost efficiency, risk reduction and quality output is possible. Adopting AI could help project managers, particularly in healthcare institutions in Nigeria achieve these

Theme 2: Risk identification and prevention

Another important theme identified is risk identification and prevention based on the response of the participants. It was highlighted that AI has potential to detect and prevent risk before and during project execution. As noted by R3, AI application has influenced project management in Nigeria healthcare context through data analytics and predictive modeling, helping to identify and prevent potential risks. Supporting this, R4 explained that "we use predictive analytics to identify risk. Also, R5 added they used AI-powers dashboard "that automatically analyse surveillance data and flagged anomalies like unexpected case spikes". One of the roles of a project manager is to identify and prevent risk. Early detection of risks allow project manager and its team to identify what could go wrong, plan corrective and preventive actions, and make a better decision

Theme 3: Quick and accurate decision making

The third theme identified is quick and accurate decision making. As highlighted by the participants, AI adoption in Nigerian healthcare institutions has improved the decision making process in Nigerian health institutions. R5 stated that "AI helped project teams act fast in high burden areas". Also, R6 said that "AI has helped us get better results and give quick direction, saving time". The statements from the participants show how important quick and accurate decision making is to project management, particularly in the context of healthcare institutions in Nigeria. Fast and accurate decision making helped project managers in reducing risk, minimizing project delay, optimizing resources, all which drive improved project performance

Theme 4: Reduced Human error.

Lastly, reduction in humans was identified as one of the impacts of AI application on project management practices in the context of Nigerian healthcare institutions. Relying on manual tools or traditional methods of project management can result in human error, which in turn can result in rework, project delay, budget overrun, wasting of resources. As noted by R4, "AI helps with automated data cleaning, which reduces human error in reports submitted to the ministry". R1 stated that "AI saves time, reduces human error and helps with resource allocation". Participants believed that with adoption of AI, data cleaning and analysis not done manually but digitally, reducing the likelihood of human error.

While quantitative findings suggest that AI adoption has a moderate significant impact on project management practices in Nigerian healthcare institutions. Qualitative findings revealed further that accurate project planning and monitoring, risk identification and prevention, quick and accurate decision making and reduced human error where the impact of AI on health-related project in Nigerian setting

RQ2: What are the key opportunities that AI presents for planning, monitoring, and executing healthcare-related projects?

Table 3.2

Opportunities AI offers in improving planning, monitoring and executing health related projects

Project Management	Response	Mean	Degree of Significance
Planning	AI improves accuracy of project planning and forecasting in healthcare delivery	4.3684	0.8736
	AI reduces project costs and resources wastage through optimized resource allocation and utilization	4.1578	0.8315
	AI enables better decision making through healthcare data analytics	4.2631	0.8526
	AI enhance health project scheduling, creating optimal work plan and timeliness	4.3684	0.8736
Monitoring	AI tools minimize human error in healthcare project	4.3684	0.8736

Continuation of Table 3.2

	AI facilitates real-time data analysis and predictive monitoring	4.1842	0.8368
	AI foster automated progress reporting	4.3432	0.8721
	AI help in detecting early risk before they escalate	3.9764	0.7865
Execution	AI improves stakeholder communication and engagement during execution to prevent confusion and minimise duplication of tasks	4.2105	0.8421
	Through AI, quicker and accurate decision during execution is possible	4.4542	0.8766
	AI enhances risk identification and mitigation strategies	4.3947	0.8789
	AI minimize administrative burden, enabling team focuses on strategic activities	4.0323	0.8122

Source: (Computed by the Researcher, 2025)

Table 3.2 presents the opportunities AI offers in improving planning, monitoring and executing of health related projects in Nigerian healthcare institutions. On the average, participants were in agreement that AI improves accuracy of project planning and forecasting with mean value of 4.36842, minimise project cost and resources wastage through optimized resources allocation and utilization (mean=4.1578), enables better decision making through healthcare data analytics (mean=4.2631), enhances health project scheduling, creating optimal work plan and timeliness (mean=4.3684). The opportunities provided by AI in improving planning of health related projects is highly significant

Similarly, participants were in agreement that AI minimizes human error in healthcare project (mean=4.3684), facilitates real-time data analysis and predictive monitoring (mean=4.1842), foster automated progress reporting (mean=4.3432), help in detecting potential risk early before it escalate (mean=3.9764). This implies that AI offers significant opportunities in improving health related projects in Nigerian healthcare institutions.

On the average, participants were in agreement that AI improves coordination of workflow, stakeholder's communication and engagement during project execution to prevent confusion and duplication of tasks or work (mean=4.2105), enable quicker and accurate decision during execution (mean=4.4542), enhance risk identification and mitigation during

project execution, minimize administrative burden (mean=4.3947), enabling team focuses on strategic activities (mean=4.0323). This implies that AI offers opportunities in improving execution of health related projects in Nigerian health.

RQ3: To what extent has AI adoption improved project planning, monitoring and execution in Nigerian healthcare institutions?

AI adoption and project planning in Nigerian healthcare institution

To check the influence of AI adoption on project planning in Nigerian health institutions, linear regression analysis was conducted. The results (Appendix 3) shows that AI adoption significantly impacted project planning in Nigerian healthcare institutions (F=11.956, p=.001). The coefficient of AI was .253, as indication that a unit increase in AI adoption improves on project planning in Nigerian healthcare institutions by .253. F-Probability lower than 5% significant result to rejection of null hypothesis that AI adoption does not improve project planning significantly. This suggests that AI adoption significantly improves project planning within Nigerian healthcare institutions. Additionally, the coefficient of determination (R^2) was .489, meaning that AI adoption accounted for about 48.9% of variation in project planning.

AI adoption and project monitoring in Nigerian healthcare institution

To investigate the impact of AI adoption on project monitoring in Nigerian health institutions, linear regression analysis was performed The results (Appendix 3) shows that AI adoption significantly improves project monitoring in Nigerian healthcare institutions (F=27.907, p=.000). The coefficient of AI was .269, suggesting that a unit increase in AI adoption improves project monitoring in Nigerian healthcare institutions by .269. F-Probability lower than 5% significant result to rejection of null hypothesis that AI adoption does not improve project monitoring significantly. This suggests that AI adoption significantly improves project monitoring within Nigerian healthcare institutions. In addition, the coefficient of determination (R^2) was .579, meaning that AI adoption accounted for about 57.9% of variation in project monitoring.

AI adoption and project execution in Nigerian healthcare institution

To confirm the contribution of AI adoption in improving project execution in Nigerian health institutions, linear regression analysis was conducted. The results (Appendix 3) shows that AI adoption significantly improves project execution in Nigerian healthcare institutions (F=14.908, p=.000). The coefficient of AI was .279, suggesting that a unit increase in AI adoption improved project execution in Nigerian healthcare institutions by .279. F-probability

lower than 5% significant result to rejection of null hypothesis that AI adoption does not significantly improve project execution. This suggests that AI adoption significantly improves project execution within Nigerian healthcare institutions Moreover, the coefficient of determination (R^2) was .579, meaning that AI adoption accounted for about 54.9% of variation in project execution.

The result above has proven that AI adoption has a significant impact in improving project management within Nigerian healthcare institutions, particularly during planning, monitoring and execution of health-related projects.

Table 3.3:

Summary of Findings (Opportunities offered by AI and Impact of AI)

Project Management	**Opportunities Offer by AI**	**Impact of AI**	**Remark**
Project Planning	(1) Accurate project planning and forecasting, (2) Better decision making, (3) Enhanced health project scheduling, and (4) creation of optimal work plan and timeliness	(F=11.956, p=.001, R^2= .489).	Statistically significant
Project Monitoring	(1) Real time data analysis and predictive project monitoring, (2) Reduced human errors and (3) early detection of risk before escalation	(F=27.907, p=.000, R^2=.579).	Statistically significant (p<0.05)
Project execution	(1) stakeholder's communication and engagement, (2) Risk identification and mitigation, (3) Minimizing administrative burden	(F=14.908, p=.000,. R^2=579).	Statistically significant (p<0.05)

Source: (Computed by the Researcher, 2025).

RQ4: What implementation challenges could hinder the adoption of AI as a project management assistant in Nigeria's healthcare sector?

Figure 3.4: *Concerns of Using AI in project management*

Continuation of Figure 3.4
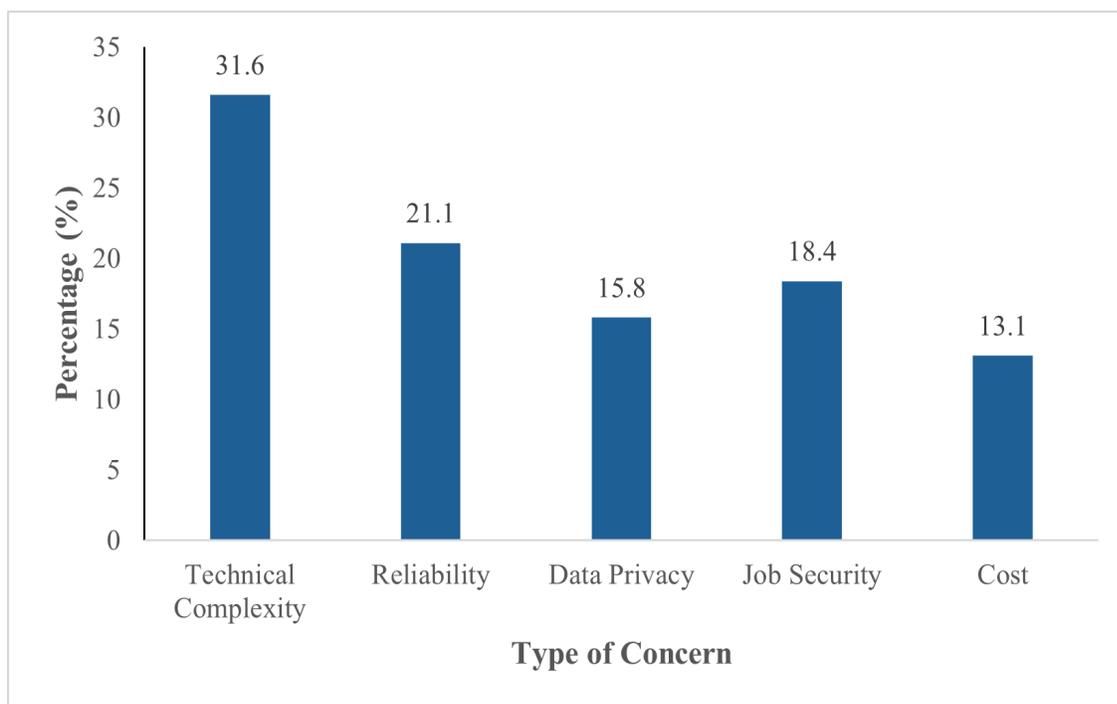
Source: (Computed by the Researcher, 2025).

Figure 3.4 presents the analysis of the opinion of the participants on concerns of Using AI in project management. Technical complexity of AI applications were identified as the major concern of using AI in project management as noted by the majority (31.6) of participants. Others include reliability, job security, privacy and cost.

To further analyse the concerns of Using AI in project management, data collected through interview were subjected to thematic analysis

Theme 1: Poor Data protection

From the thematic analysis, poor data protection emerged as one of the concerns of using AI in project management within Nigerian healthcare institutions. As explained by R4 "my biggest concern is data privacy because in Nigeria, data protection systems are still weak, leading to patient data being easily compromised". Supporting this, R3 stated that "my main concern is data privacy". R5 also noted that data protection is the major concern, according to him, "my main concern is data protection because most of our hospitals lack strong cyber-security systems.

Theme 2: High Cost of Implementation

Participants highlighted the high cost of implementing AI as their concern of using AI applications for project management in healthcare institutions. For instance, R5 explained that implementing and maintaining an AI system is expensive. In support of this, R3 stated high cost of implementation is the concern of using AI in project management practices. Similarly, R4 noted that high cost of these technologies and poor maintenance culture can make sustainability difficult in public hospitals.

Findings from quantitative analysis revealed that technical complexity was identified as the major concern of using AI in project management. This indicated that most of the project managers find AI applications difficult to use or lack the technological skills and knowledge needed. Some AI could involve a high level of technology or advanced tools, therefore a high level of training, technological skill and knowledge are required to understand their uses. However, findings from thematic analysis also showed additional concerns of poor data protection and high cost of implementation of AI. Thus, project managers not only face technical complexity using AI, they also encounter underlying issues related to security of sensitive data and financial demand for implementation of AI systems.

Figure 3.5: *Challenges hindering the adoption of AI as a project management assistant in Nigeria's healthcare sector*
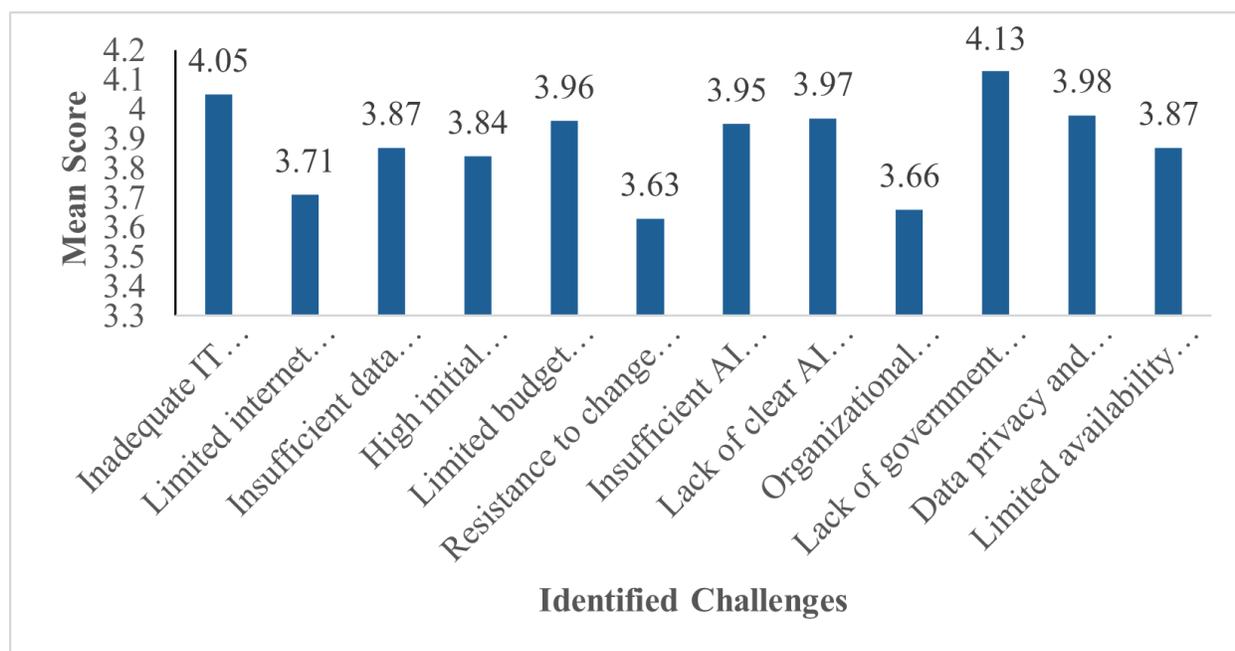
Key 4.5-5=Major Barrier, 3.5-4 Significant Barrier, 2.5-3=Moderate Barrier,1.5-2=Minor Barrier, less than 1.5=Not a barrier

Source: (Computed by the Researcher, 2025)

Figure 3.5 presents the challenges hindering the adoption of AI as a project management assistant in Nigeria's healthcare sector. According to the result, all the challenges above were identified as significant barriers to full adoption of Artificial Intelligence as project management assistance in the Nigerian health sector. However, lack of government policies and regulatory guidelines with mean of 4.13 (institutional challenge), inadequate IT infrastructure and system with mean of 4.05 (technological challenge), data privacy and security concerns with mean of 3.98 (organizational challenge) were ranked as the major challenges hindering the full adoption of Artificial Intelligence in project management activities within Nigerian health sector.

In support of the above quantitative analysis on challenges hindering implementation of AI in Nigerian healthcare institutions, below are the qualitative analysis.

Theme 1: Inadequate IT Infrastructures and Training

Sub-theme 1: Poor network connection

Evidence from participants highlighted that inadequate IT infrastructures remains one of the major challenges hindering implementation of AI as a project manager assistance in Nigerian healthcare institutions. As noted by R3, the challenges include poor internet connectivity and inadequate technological tools are the main challenges hindering implementing AI in project management. He went further by saying "we have to get separate routers for each department because network providers like MTN and Airtel can be unreliable in Nigeria. Supporting this, R5 and R1 also made mention of poor IT infrastructure as the problem impeding implementation of AI as project manager assistance in Nigerian healthcare institutions

Sub-theme 2: Lack of sufficient technological skills or training

To operate AI effectively, sufficient technological skills or training are required. Participants highlighted that in Nigerian health institutions, many staff, particularly project managers, have little or lack technological skills to operate AI, particularly for project management practices, resulting in project managers using or relying on manual methods. For instance, R1 said that there is a lack of know-how and inadequate IT training among staff.

Theme 2: Preferences for manual or traditional method

Sub-Theme 1: Resistance to change

Resistance to change is the reason many project managers, particularly in healthcare institutions do not want to adopt AI in project management practices. Participants believed that they feel more comfortable using traditional or manual methods than AI. For instance, R4 stated that "many project officers are not yet comfortable with AI technology, they prefer manual methods". The statement of R4 is consistent with R5, saying that "there is resistance to change, some staff prefer traditional reporting methods". R1 added by elaborating more on the reason they prefer manual than AI. According to R1 "many staff resist change-they prefer to use manual methods because they are not computer literate" and there is limited government support.

Sub-theme 3: Poor acceptance of AI

Participants also emphasize that there is low acceptability of AI among staff of Nigerian healthcare institutions due to lack of trust, resulting in their preference for traditional or manual method of project management practices in Nigerian health institutions. As explained by R2 "I thinks is mainly about acceptability and lack of trust for AI, the acceptance level isn't there yet"

Theme 3: Government policy guiding AI in health management

Another theme identified is limited government policy guiding AI in health management. This was identified as another challenge impeding utilization of AI as a project manager assistant within Nigerian healthcare institutions. R4 is of the view that "limited government policy guiding AI in health management hinder AI implementation in health related projects. In support of this, R5 stated that lack of clear government policy on AI uses has slowed down AI adoption. R1 there is limited government policy supporting AI in Nigeria. When the government policy about AI is poor or limited, it create confusion and lack of trust, so organization become afraid, resulting to continuous utilization of manual methods by project managers instead of AI

Theme 4: Cost and Maintenance

From the theme identified, participants believed that financial demand for acquiring AI software and training is very huge, incapacitated many organizations like public hospitals to purchase or sustain these tools. To back this up, R3 in his response said that "high cost of setting up AI and maintenance of AI is the major problem" hindering AI implementation in Nigerian, particularly in the health sector. R5 also pointed out that "the main challenge is cost and capacity because many public institutions can't afford AI tools, and when they can, there are few local experts to maintain them"

The result from thematic analysis revealed that major challenges hindering AI adoption in project management practices in Nigerian healthcare institutions include Inadequate IT Infrastructures and Training (technological challenges), preferences for manual or traditional method and cost and maintenance (organizational challenges), Government policy guiding AI in health management (institutional challenges). This result is consistent with findings from quantitative analysis, suggesting that the major problem hindering AI adoption in project management practices in Nigerian healthcare institutions stem from institutional challenges (lack of government policies and regulatory guidelines), technological challenges (inadequate IT infrastructure and system), and organizational challenges (data privacy and security concerns).

Table 3.4:

Summary of Findings (Challenges)

	Major Challenges Hindering AI implementation	**Challenge Type**
1	Inadequate IT Infrastructures and Training	Technological challenge
2	Preferences for manual or traditional method	Organizational challenge
3	Government policy guiding AI in health management	Institutional challenge
4	Cost implementation and Maintenance	Organizational challenge
5	Data privacy and security concerns	Organizational and Institutional challenge

Source: (Computed by the Researcher, 2025).

3.2 Discussion of Findings

The discussion of findings are done based on the objectives of the study. From the analysis both the key opportunities offer by AI for project management practices and challenges identified hindering the implementation of AI in Nigerian health institution are discussed extensively below

Key Opportunities offered by AI for project planning

One of the aspects of project management is project planning. It is extremely essential owing to the fact that it plays a crucial role in the smooth operation and accomplishment of project goals in healthcare institutions and other institutions. According to the result, the key

opportunities AI offers for planning of health related projects include accurate project planning and forecasting, better decision making, enhanced health project scheduling, and creation of optimal work plan and timeliness.

Findings show that AI enhances accuracy of project planning and forecasting. Accurate planning and forecasting are especially essential in healthcare institutions where resource constraints, fluctuating disease pattern and unpredictable disease pattern often complicate project planning. This finding is consistent with Bharati and Sandbrink, 2024; Hosseini, 2024; Ogunbukola, 2024, highlighting that AI is a transformative instrument in healthcare project planning and management.

It was reported that AI strongly enhances decision making within the healthcare project environment. Participants demonstrated that AI tools assist project planners and project administrators to evaluate complex health data, point out patterns and generate evidence based insights, enabling or enhancing the capability of the project managers within healthcare institutions to make timely and informed decisions regarding resources allocation and risk management. This result is in support of Adindu et al. (2025) noting that Artificial Intelligence supports accurate decision making, problem solving functions, effective allocation of resources, adequate distribution of tasks, resulting in reduction in minimization of risk and project failure.

Findings revealed further that through AI usage, project scheduling is substantially enhanced. As highlighted by the participants, AI-based scheduling tools help project managers and project teams in detecting the most efficient sequence of activities, estimating task durations and identifying possible delays before they happen. This however, minimizes project overrun and makes sure that tasks are carried out systematically. Additionally, enhanced scheduling supports better coordination among project team and different departments within the healthcare institutions, which improves overall project efficiency

The result demonstrates that AI promotes creation of work plans and timeliness. AI assists project managers or project planners determine the best strategies for accomplishing project goals within a short period of time through analysis of large volumes of data. This results in more realistic timelines and prevents the regular project obstacles confronted in many Nigerian healthcare institutions. It is the belief of the participants that optimization capacity of AI results in clearer work breakdown structure and more attainable and feasible project milestones.

Key Opportunities offer by AI for project Monitoring

Another important aspect of project management is project monitoring. Healthcare institutions, particularly in the Nigerian context, operate in a dynamic environment characterized by inefficiency delays, errors which negatively affect patient care (Anyika, 2014). Effective and systematic project monitoring is needed to ensure health projects stay on track with minimal project inefficiency, error and project delay.

Findings demonstrated that AI offers significant opportunities in improving monitoring of health related projects in Nigerian healthcare institutions. The key opportunities offered by AI application in improving project monitoring according to the participants were real time data analysis and predictive project monitoring, reduced human errors and early detection of risk before escalation.

Real time data analysis and predictive project monitoring are vital opportunities provided by AI to project managers in healthcare institutions, suggesting that AI enables instant processing of large volumes of health-related project information, enhancing the accuracy and timeliness of projects. This supports early findings from Ogunbukola et al., 2024 and Coronator et al. (2020). Ogunbukola et al. (2024) observed that Artificial Intelligence possesses the features that can analyse large volumes of dataset, predict project outcome, and allocate resources efficiently, enabling project managers to focus on strategic decision making and leadership. By analyzing large historical health project related data in real time, AI can be of help to project managers in identifying trends and patterns, predict future occurrence (likelihood of meeting deadline and of staying within budget time), foreseen bottlenecks that would not have been possible for humans to detect. In the healthcare setting, Coronator et al. (2020) documented that analyzing data in real time enables project managers to forecast and identify potential problems long before they occur or become critical. For example, accurate prediction and early detection of likelihood of shortage in essential health practitioners, hospital equipment breakdown and disruption in supply of medicine through AI system, enable project managers and health administrators to take timely corrective and preventive measures/actions capable of minimizing delay, avoiding costly emergency and prevent hospital failure

The utilization of AI automates routine tasks like updating progress reports, tracking deadlines, confirming compliance with project standard and checking resources utilization, all which can prevent human errors and improve reliability of monitoring data. This aligns with Jain et al., 2018; Me & Smith, 2024, whose studies reported that heavy manual, tedious and time consuming tasks such as scheduling meeting, updating project timeline, assigning task, tracking

progress and generating reports can be overcome through AI powered system, allowing staff to prioritize patient care, saving time and minimize error.

The result revealed further that AI enables early detection of risks before escalation to failure. This is because AI systems can repeatedly scan project indicators and fish out unusual patterns like increasing cost, supply shortage, scheduling delays, declining quality metrics. These findings are consistent with the studies of Duica et al. (2024) and Ogunbukola, 2024, emphasizing that AI remains powerful tool profoundly shaped project management by automating routine tasks, improve risk managements, improve precision and minimize risk connected human judgments and with traditional method of keeping record, resulting to total change in the way project are monitored.

Key Opportunities provided by AI for project execution

The result of this study confirmed that AI offers significant opportunities in improving execution of health related projects in Nigerian healthcare institutions. One of the key opportunities includes improving stakeholder's communication and engagement during project execution to prevent confusion and duplication of tasks or work. This aligns with the study of Kaplan & Haenlein (2019), reporting that AI powered has potential in revolutionizing how project managers communicate with team members and other stakeholders, ensuring that real time information is accessible for stakeholders involved. The next opportunities identified was enhancement of risk identification and mitigation during project execution, minimizing administrative burden, enabling team focuses on strategic activities. This is consistent with Felicetti et al. (2024), integration of AI into project management is a revolution, it can take care of many office and paper related tasks such as keep track of medical records, booking of appointment for patients, handling of billing, that usually slow down health workers, allowing doctors and nurse focus on other important tasks.

Major challenges identified

Major challenges identified, hindering AI adoption in project management practices in Nigerian healthcare institutions include inadequate IT Infrastructures and Training, preferences for manual or traditional method; high cost of implementation and maintenance, poor government policies and regulatory guidelines AI usage, data privacy and security concerns.

The study discovered that inadequate IT Infrastructures was one of the major challenges hindering the implantation of AI into project management practices in Nigerian healthcare

institutions. Inadequate IT infrastructures like poor network connection can significantly impede data flow and performance of real-time data analysis and monitoring systems, which are important for project oversight. This findings aligns with Okwukwu et al., 2025; Robinson, 2020. According to Okwukwu et al. (2025), successful integration of AI requires digital infrastructure, because AI systems cannot function effectively without digital infrastructure. Thus, healthcare institutions that have not yet invested in IT infrastructure may struggle to enjoy the full benefit of AI systems in project management. Robinson (2020) also found that inadequate internet connection hinders the adoption of AI technologies in project management within Nigeria public health system.

Another notable challenge was the high cost attached to implementation and maintenance of AI. This is consistent with the Ali et al., 2025; Chung et al. 2021; Ogunbukola, 2024; Okwukwu et al., 2025, highlighting implementation and maintenance cost as the problem to AI adoption in project management in developing countries like Nigeria. Ogunbukola (2024) stressed that implementing Artificial Intelligence technologies is not an easy task, it requires huge investment (finance and time needed for training). Supporting this view, Okwukwu et al. (2025) reported that AI models need significant investment in both software tools and hardware tools, for them to service their purpose, which can be costly. In addition to this, keeping the Artificial Intelligence system working effectively needs constant or continuous maintenance and upgrading, cybersecurity measures, safe data storage, all which add to the long term financial burden. Most Nigerian public health institutions already operate on limited budgets, therefore adopting and implementing Artificial Intelligence in their project management practices can be too expensive for them unless they receive financial support from outside sources.

Preference for manual or traditional method of project management among healthcare among staff is another notable challenge. Participants expressed concern about lack of trust for AI and finding comfort using manual or traditional methods compared to uses of AI, resulting in slow adoption of innovative technologies like AI.

Additionally, another major challenge identified was data privacy, protection and security. Participants expressed concerns that the data security and protection system in Nigeria is very weak, exposing patient's data to hackers. This results in low usage of AI in Nigerian healthcare institutions. In a country like Nigeria where there is a weak data protection framework, hospitals and patient's data can be susceptible and vulnerable to security risk, breaches and unauthorized access (Ezemerihe et al., 2024; Okwukwu et al., 2025). Many African healthcare

institutions, particularly Nigeria, lack secure networks, exposing project management tools used in Hospital hackers to obtain sensitive patient information (Oladipupo et al, 2024).

Lastly, poor government policies and regulatory guidelines governing AI are not critical challenges identified, hindering the implementation of AI into project management practices within Nigerian healthcare institutions. When the government policies and regulatory guidelines governing AI are weak or poor, it uncertainly limits institution confidence and decreases investment in AI driven systems. This is consistent with the report of Ezemerihe et al. (2024); Okwukwu et al. (2025); Oladipupo et al, (2024), stating without robust cyber security measure, consistent enforcement, policies and regulations, health institutions in Nigeria may be reluctant in adopting AI system.

Implication of Findings

The discoveries of this research have several practical implications ranging from practical and policy implications for healthcare institutions, project managers and policy makers involved in health related project planning, monitoring and execution. It has been empirically established that AI-driven tools can significantly enhance accurate forecasting, improve project scheduling, foster better decision making, and overall project planning efficiency. By implication, healthcare administrators can improve project outcomes by gradually integrating AI-support planning systems to optimize timeliness, resource allocation and milestone tracking. The discoveries that AI offers real time data analysis, predictive monitoring, early risk identification and reduction in human error is an indication that healthcare project management can utilize AI tools to support project monitoring and prevent project delays. By implication, implementing AI-based project monitoring systems will assist healthcare institutions and project managers to quickly detect potential risks or bottlenecks, and make data adjustments to enhance compliance with project plans. Again, in this study, several key challenges (inadequate IT infrastructure, cost of implementation and maintenance, weak policies and regulation guidelines, preference for manual method and poor data privacy and protection) have been identified hindering the implementation of AI in project management practices in Nigerian healthcare institutions. The practical implication here is that healthcare institutions, particularly, those in Nigeria required huge investment in not only the digital infrastructure but capacity building. The Nigerian government can support healthcare institutions by launching financial incentives, grants or loans, capable of assisting healthcare institutions to acquire AI tools. Additionally, developing clear policies and regulation guidelines for AI usage will go a long way in improving the confidence and trust for AI use across public and private healthcare in Nigeria.

Theoretically, this research expanded the Technological Acceptance Model by offering empirical evidence that factors like IT infrastructure and organization readiness strongly shaped AI adoption level within healthcare institutions. The findings suggest that when AI is perceived as advantageous to project management practices, factors like inadequate infrastructure, cost of implementation, data project problem, resistance to change, poor government population and regulation may hinder its adoption

CONCLUSION AND RECOMMENDATIONS

This research empirically examined the opportunities and implementation challenges of using Artificial Intelligence (AI) as a project management assistant in public healthcare institutions in Nigeria. Guided by the thesis broad and specific objectives, the research findings offers clear empirical evidence that AI adoption has played a vital role in assisting project managers within the Nigerian healthcare institutions in executing their tasks effectively.

1. Having analysed the perspectives of various authors in the literature, the connection between AI and project management, as well as the benefits of AI to PM was established. While PM is the application of essential aspects of organization such as human skills, knowledge, to project activities to achieve the project requirement and organizational goal (PMBoK, 2017; Abyad, 2021). AI remains a powerful tool that augments human potentials capable of influencing PM and assisting project managers. It plays a significant role such as automating routine tasks, improving risk management, resulting in total change in the way projects are planned, organized and executed as well as the decisions are made (Duica et al., 2024; Nobre, 2020). The benefit of AI to project management includes correction of human error (Oropesa, 2020), automation of administrative and repetitive tasks, ability to analyse large volumes of dataset, predict project outcome (Me & Smith, 2024), and allocate resources efficiently, enabling project managers to focus on strategic decision making and leadership (Felicetti et al., 2024; Ogunbukola et al., 2024).

2. In addressing the research objective two (2), which sought to examine the impact of AI application on project management practices within healthcare institutions in Nigeria, the findings revealed that project management practices such as project planning, project monitoring and project execution in sampled Nigerian health institutions were positively and significantly impacted by the AI applications ($p < 0.05$).

3. With respect to research objective two, which identified the opportunities AI offers for improving planning, monitoring, and execution in health-related projects, the findings revealed that improved real-time data analysis, accurate planning and forecasting, optimal scheduling, risk detection and management ability, predictive monitoring, reduction in human error and better decision making were the opportunities offered by applying AI in project management practices in Nigerian healthcare institutions. These opportunities demonstrated the capability and potential of AI in revolutionizing the project

management process and enhancing overall effectiveness and efficiency of healthcare delivery in Nigeria.

4. Furthermore, in response to objective three, which investigated the key technological, organizational, and institutional barriers to AI adoption, the findings revealed that several challenges were identified as hindrance to AI implementation in healthcare institutions in Nigeria. They include inadequate IT infrastructure (technological barrier), cost of implementation and maintenance and preference for manual methods (organizational barrier), weak policies and regulation guidelines (institutional barrier), poor data privacy and protection (institutional and organizational barrier). This demonstrated that while the potential of AI is high, Nigerian healthcare needs more investment into AI infrastructure, capacity building, strong policies and standard regulation framework guiding AI usage to harness the full potential of AI.

Conclusively, AI adoption in health related project management within Nigerian healthcare institution is both promising and feasible, but needs collective and coordinated efforts from the management of healthcare institutions, Nigerian government, policy makers and AI developers to strengthening infrastructure development, capacity building, developing clearer policy guideline and standard regulation framework and developing less expensive AI and AI equipment.

Recommendations

Based on the discoveries from the study, practical recommendations are suggested to harness the full benefits of AI adoption toward project management practices in Nigerian healthcare institutions.

1. Collaborate with AI developers: To reduce cost of implementation and maintenance, Nigerian health instructions need to collaborate or partner with AI developers, tech companies. Collaborating with AI developers can also encourage customization of AI tools that fit into the local health system requirement

2. Huge investment in IT infrastructures: Poor IT infrastructures was one of the problems identified as a hindrance to AI implementation into project management practice in Nigerian healthcare institutions. This suggests that Nigerian healthcare institutions should improve their IT infrastructures including network connection, to support real time data analysis, planning, forecasting and monitoring.

3. Provision of continuous IT training for project managers, and other project personnel: Providing continuous IT training for project managers, and other project personnel within healthcare institutions, will not only minimize staff preference for traditional method of project management but enhance their IT skills, data analysis and interpretation skills, translating to enhanced AI integrations

4. Creation of clear policies and regulation framework for AI usage: Government should make policies and develop clear regulation frameworks that are transparent for AI usage, data protection, and cybersecurity in Nigerian to build trust and confidence and ensure AI is deployed effectively and responsibly.

Limitation and Suggestion for further study

Despite the contribution of this study, there are critical limitations that need to be acknowledged and addressed by other studies. The first limitation of this study is that participants utilised were recruited through referral-based approach (snowball sampling), which is prone to selection bias. With this approach, participants are more likely to recommend friends and colleagues, sharing the same view, experience and attitude, which may minimize the diversity of view point in this research. Further studies should apply probabilistic sampling techniques such as simple random sampling which gives every element of the population a chance to be part of the research.

The study majorly focuses on project planning, monitoring and execution aspects of project management. However, the ability of this study to capture other important aspects of project management, such as project evaluation, budgeting, stakeholder management and other is critical limitation, which future studies should address for a more comprehensive understanding of AI's roles and impact in the broader project management practices.

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APPENDIX

APPENDIX I
RESEARCH QUESTIONNAIRE

Instruction: Please tick [√] of fill in as appropriate

Section A: Demographic information

1. Gender [ ] Male [ ] Female [ ] Prefer not to say

2. Age Bracket [ ] Less than 25 years [ ] 25-34 years [ ] 35 – 44years [ ] 45 years and   above

3. Educational Qualification [ ] ND/NCE [ ] HND [ ] B.Sc/B. A [ ] M.Sc [ ] PhD [ ] Others [ ]

4. Occupation: [ ] Health workers [ ] Project managers [ ] IT officer [ ] Administrator [ ] Others [ ]

5. Type of institution: [ ] General Hospital [ ] Private hospital [ ] Primary health Centre [ ] Others

6. Years of Working experience: [ ] less than 5 years [ ] 5 – 9 years [ ] 10-15 years [ ] 15 years and above

7. What types of healthcare projects do you typically manage or participate in? [ ] Infrastructure development (buildings, equipment installation) [ ] Medical equipment procurement and implementation [ ] Staff training and development programs [ ] Patient care improvement initiatives [ ] Health information systems implementation [ ] Public health campaigns and outreach [ ] Research and clinical trial projects [ ] Quality improvement and accreditation projects [ ] Other (please specify): _____

8. How would you rate your current organisation's technology adoption level? [ ] Very advanced (early adopter of new technologies) [ ] Advanced (adopts proven technologies quickly) [ ] Moderate (adopts technologies when necessary) [ ] Basic (slow to adopt new technologies) [ ] Very basic (minimal technology use)

9. Geographic location of your healthcare facility: [ ] Urban (major city) [ ] Semi-urban (smaller city/town) [ ] Rural (village/remote area)

10. What is your current level of involvement in project management activities? [ ] Full-time project manager [ ] Part-time project management responsibilities [ ] Project team member [ ] Project stakeholder/end user [ ] No direct project involvement

Section B: Current AI Usage and Experience in Healthcare Project Management

B1. Which of the following AI applications are currently being used in your organisation's healthcare projects? (Select all that apply)

[ ] Predictive analytics for patient flow/resource planning [ ] AI-powered scheduling and resource allocation [ ] Automated project progress monitoring and reporting [ ] Risk prediction and management systems [ ] AI-enhanced decision support systems [ ] Natural language processing for documentation [ ] Machine learning for cost estimation and budgeting [ ] AI-driven quality assurance and compliance monitoring [ ] Chatbots for stakeholder communication [ ] Computer vision for facility/equipment monitoring [ ] Electronic Health Records (EHR) with AI features [ ] Supply chain management systems with AI [ ] Diagnostic systems with AI integration [ ] None of the above [ ] Other (please specify): _____

B2. Rate the current level of AI integration in healthcare project management in your organization:

[ ] Fully integrated (AI is central to most project processes) [ ] Highly integrated (AI used in multiple key processes) [ ] Moderately integrated (AI used in some processes) [ ] Minimally integrated (AI used in few processes) [ ] Not integrated (no AI usage in project management)

B3. Rate the overall level of AI adoption in healthcare project management across Nigeria

[ ] Very advanced (widespread adoption) [ ] Advanced (growing adoption) [ ] Moderate (selective adoption) [ ] Limited (minimal adoption) [ ] Very limited (rare adoption)

Section C: Opportunities for AI Utilization in Project Management

Kindly indicate your level of agreement with the following statement utilising the scale below:

5=Strongly Agree, 4=Agree, 3=Neutral, 2=Disagree, 1=Strongly Disagree

S/N	Statement	5	4	3	2	1
C1	AI improves accuracy of project planning and forecasting in healthcare delivery					
C2	AI enhance efficiency in project delivery and resources allocation					
C3	AI enables better decision making through healthcare data analytics					
C4	AI tools minimize human error in healthcare project execution					

		5	4	3	2	1
C5	AI facilitates real-time project monitoring and control					
C6	AI improves stakeholder communication and engagement					
C7	AI reduces project costs through optimized resource utilization					
C8	AI enhances risk identification and mitigation strategies					

Section D: Current Barriers to AI Adoption in Healthcare Project Management

Rate how significantly each factor currently limits AI adoption in your organization: *Scale: 5 = Major barrier, 4 = Significant barrier, 3 = Moderate barrier, 2 = Minor barrier, 1 = Not a barrier*

S/N	Statement	5	4	3	2	1
1D	Inadequate IT infrastructure and systems compatibility					
2D	Limited internet connectivity and bandwidth					
3D	Insufficient data quality and standardization					
4D	High initial investment and implementation costs					
5D	Limited budget allocation for AI technology					
6D	Resistance to change among healthcare professionals					
7D	Insufficient AI training programs and capacity building					
8D	Lack of clear AI strategy and implementation roadmap					
9D	Organizational culture resistant to technological change					
10D	Lack of government policies and regulatory guidelines for AI					
11D	Data privacy and security compliance requirements					

		5	4	3	2	1
12D	Limited availability of healthcare-specific AI solutions					

Section E: Requirements for Scaling AI Implementation

E1. Rate the importance of each requirement for successfully scaling AI implementation in project management: *Scale: 5 = Critical requirement, 4 = Very important, 3 = Moderately important, 2 = Slightly important, 1 = Not important*

S/N	Statement	5	4	3	2	1
1E	Adequate funding and budget allocation					
2E	Skilled AI professionals and project managers					
3E	Robust IT infrastructure and systems					
4E	Comprehensive staff training programs					
5E	Clear AI implementation strategy and roadmap					
6E	Government policy support and incentives					
7E	Reliable technical support and maintenance					
8E	Proven AI tools specifically for healthcare projects					
9E	Strong leadership commitment and vision					
10E	Gradual implementation and change management					

E2. What implementation readiness does your organization currently have for scaling AI in project management?

[ ] Ready to implement immediately (resources and infrastructure in place) [ ] Ready within 1-2 years (with moderate investment and planning) [ ] Ready within 2-3 years (with significant investment and preparation) [ ] Ready within 3-5 years (requires major organizational transformation) [ ] Not feasible in foreseeable future (fundamental barriers exist)

E3. What external support would be most valuable for scaling AI implementation?

[ ] Government funding and grants [ ] Technical partnerships with AI companies [ ] Training and capacity building programs [ ] Regulatory framework and policy support [ ] Industry collaboration and knowledge sharing [ ] International technical assistance and expertise

Section F: Technology Acceptance and Future Readiness

F1. If advanced AI project management tools were available, how easy do you think they would be to use?
[ ] Very easy [ ] Easy [ ] Moderate [ ] Difficult [ ] Very difficult

F2. What would be your primary concern about using AI in project management?
[ ] Job security [ ] Technical complexity [ ] Cost [ ] Reliability [ ] Privacy [ ] Other: ___

F3. Rate your level of agreement with the following statements: *Scale:* 5=Strongly Agree, 4=Agree, 3=Neutral, 2=Disagree, 1=Strongly Disagree

S/N	Statement	5	4	3	2	1
F3A	My organization is ready to adopt AI tools in full scale for project management					
F3B	AI has potential to revolutionaries project management in the healthcare sector					
F3C	I am willing to be trained or take part in training programs to learn about AI					
F3D	Government and policy makers should promote AI integration into healthcare management					

Section G: Project Management Process Assessment

1. In your current role, which project management activities do you perform regularly?

(Select all that apply)

[ ] Project planning and scope definition [ ] Resource allocation and scheduling [ ] Budget management and cost control [ ] Risk identification and mitigation [ ] Quality assurance and

control [ ] Stakeholder communication and management [ ] Progress monitoring and reporting [ ] Change management and control [ ] Project closure and evaluation

2. Rate the effectiveness of current project management practices in your organization:

[ ] Very effective [ ] Effective [ ] Moderately effective [ ] Ineffective [ ] Very ineffective

Section H: AI Potential in Specific Project Management Processes

Rate how helpful you think AI would be in the following project management areas:

(Scale: 5 = Extremely helpful, 4 = Very helpful, 3 = Moderately helpful, 2 = Slightly helpful, 1 = Not helpful)

Project Initiation:

S/N	Statement	5	4	3	2	1
	Feasibility analysis and project selection					
	Stakeholder identification and analysis					
	Initial resource estimation					

Project Planning:

S/N	Statement	5	4	3	2	1
	Work breakdown structure creation					
	Schedule development and optimization					

		5	4	3	2	1
	Resource allocation planning					
	Risk assessment and planning					

Project Execution:

S/N	Statement	5	4	3	2	1
	Real-time progress monitoring					
	Resource utilization tracking					
	Quality control and assurance					
	Communication management					

Project Monitoring & Control:

S/N	Statement	5	4	3	2	1
	Performance measurement and analysis					
	Change request evaluation					
	Issue identification and resolution					

Project Closure:

S/N	Statement	5	4	3	2	1
	Final deliverable verification					
	Lessons learned documentation					
	Project success evaluation					

APPENDIX II
INTERVIEW GUIDE FOR SEMI-STRUCTURED INTERVIEWS

Section	Research Question
Personal Data	1. What is your gender? 2. What is your age range? 3. Which type of healthcare institution are you working with? 4. For how long have you been working in the healthcare sector?

Personal experience on AI and project management	1. Can you share your idea of Artificial Intelligence? *Follow-up Probes:* ● Can you give me an example of AI that you've encountered in healthcare? ● How do you think AI differs from regular computer software? ● What concerns, if any, do you have about AI in healthcare? 2. Please, what do you understand about Project Management? *Follow-up Probes:* ● What are the biggest challenges you face in managing healthcare projects? ● Can you describe a recent project you worked on and its outcomes? ● What tools or methods do you currently use for project management?
AI Influence in the Nigerian Context	1. Based on your experience, how has AI influenced project management in the Nigerian healthcare context? (IF no, Why?) *Follow-up Probes:* ● Can you provide specific examples where you've seen AI being used? ● To what extent do you think AI is currently being used in healthcare project delivery? ● What barriers prevent wider AI adoption in Nigerian healthcare projects? ● How does the Nigerian context differ from what you know about AI use elsewhere?
AI as a project management Assistance	1. Do you believe AI can improve project management in Nigeria? Please explain how or why. 2. What do you think are the main benefits of using AI tools in managing healthcare projects? 3. What challenges are preventing effective AI implementation in healthcare project management? 4. What strategies would you suggest to enhance AI adoption in the Nigerian health sector?

APPENDIX III
OUTPUT

Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	male	23	60.5	60.5	60.5
	female	14	36.8	36.8	97.4
	prefer not to say	1	2.6	2.6	100.0
	Total	38	100.0	100.0	

Age

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	25 - 34 years	16	42.1	42.1	42.1
	35 – 44years	11	28.9	28.9	71.1
	45 years and above	6	15.8	15.8	86.8
	Less than 25 years	5	13.2	13.2	100.0
	Total	38	100.0	100.0	

Qualification

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	ND/NCE	1	2.6	2.6	2.6
	HND/BSC	24	63.2	63.2	65.8
	MSC	8	21.1	21.1	86.8
	PHD	5	13.2	13.2	100.0
	Total	38	100.0	100.0	

Occupation

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Administrator	8	21.1	21.1	21.1
	Data Scientist	1	2.6	2.6	23.7
	Health worker	10	26.3	26.3	50.0
	IT officer	5	13.2	13.2	63.2
	Others	1	2.6	2.6	65.8

Project manager	13	34.2	34.2	100.0
Total	38	100.0	100.0	

Institution

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	General Hospital	13	34.2	34.2	34.2
	Logistics and IT	1	2.6	2.6	36.8
	Primary health Center	12	31.6	31.6	68.4
	Private Company	1	2.6	2.6	71.1
	Private hospital	10	26.3	26.3	97.4
	University	1	2.6	2.6	100.0
	Total	38	100.0	100.0	

Years_experience

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	10 -15 years	4	10.5	10.5	10.5
	15 years and above	5	13.2	13.2	23.7
	5 – 9 years	13	34.2	34.2	57.9
	less than 5 years	16	42.1	42.1	100.0
	Total	38	100.0	100.0	

What_type

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Health information systems implementation	4	10.5	10.5	10.5
	Infrastructure development (buildings, equipment i	2	5.3	5.3	15.8
	Medical equipment procurement and implementation	1	2.6	2.6	18.4
	Patient care improvement initiatives	5	13.2	13.2	31.6

	Public health campaigns and outreach	11	28.9	28.9	60.5
	Quality improvement and accreditation projects	3	7.9	7.9	68.4
	Research and clinical trial projects	8	21.1	21.1	89.5
	Staff training and development programs	4	10.5	10.5	100.0
	Total	38	100.0	100.0	

Current_tech_level

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Advanced (adopts proven technologies quickly	7	18.4	18.4	18.4
	Basic (slow to adopt new technologies)	4	10.5	10.5	28.9
	Moderate (adopts technologies when necessary)	15	39.5	39.5	68.4
	Very advanced (early adopter of new technologies	4	10.5	10.5	78.9
	Very basic (minimal technology use)	8	21.1	21.1	100.0
	Total	38	100.0	100.0	

Current_level_involvement

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Full-time project manager	9	23.7	23.7	23.7
	No direct project involvement	2	5.3	5.3	28.9
	Part-time project management responsibilities	9	23.7	23.7	52.6
	Project stakeholder	8	21.1	21.1	73.7

		Frequency	Percent	Valid Percent	Cumulative Percent
	Project team member	10	26.3	26.3	100.0
	Total	38	100.0	100.0	

Have_take_part

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	38	100.0	100.0	100.0

Rate the current level of AI integration in healthcare project management in your organization

AI		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Fully integrated (AI is central to most project pr	8	21.1	21.1	21.1
	Highly integrated (AI used in multiple key process	11	28.9	28.9	50.0
	Minimally integrated (AI used in few processes)	4	10.5	10.5	60.5
	Moderately integrated (AI used in some processes)	15	39.5	39.5	100.0
	Total	38	100.0	100.0	

Rate the overall level of AI adoption in healthcare project management across Nigeria.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Advanced (growing adoption)	14	36.8	36.8	36.8
	Limited (minimal adoption)	6	15.8	15.8	52.6
	Moderate (selective adoption)	12	31.6	31.6	84.2

		6	15.8	15.8	100.0
Very advanced (widespread adoption)		6	15.8	15.8	100.0
Total		38	100.0	100.0	

AI improves accuracy of project planning and forecasting in healthcare delivery (planning)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	3=Neutral	5	13.2	13.2	13.2
	4=Agree	14	36.8	36.8	50.0
	5=Strongly Agree	19	50.0	50.0	100.0
	Total	38	100.0	100.0	

AI enhance efficiency in project delivery and resources allocation (planning)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	3=Neutral	4	10.5	10.5	10.5
	4=Agree	16	42.1	42.1	52.6
	5=Strongly Agree	18	47.4	47.4	100.0
	Total	38	100.0	100.0	

AI enables better decision making through healthcare data analytics (planning)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	2=Disagree	2	5.3	5.3	5.3
	3=Neutral	2	5.3	5.3	10.5
	4=Agree	18	47.4	47.4	57.9
	5=Strongly Agree	16	42.1	42.1	100.0
	Total	38	100.0	100.0	

AI tools minimize human error in healthcare project execution (Monitoring)

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid 2=Disagree	1	2.6	2.6	2.6
3=Neutral	6	15.8	15.8	18.4
4=Agree	9	23.7	23.7	42.1
5=Strongly Agree	22	57.9	57.9	100.0
Total	38	100.0	100.0	

AI facilitates real-time data analysis and predictive monitoring (Monitoring)

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid 1=Strongly Disagree	1	2.6	2.6	2.6
3=Neutral	7	18.4	18.4	21.1
4=Agree	14	36.8	36.8	57.9
5=Strongly Agree	16	42.1	42.1	100.0
Total	38	100.0	100.0	

AI improves stakeholder communication and engagement (execution)

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid 2=Disagree	1	2.6	2.6	2.6
3=Neutral	7	18.4	18.4	21.1
4=Agree	13	34.2	34.2	55.3
5=Strongly Agree	17	44.7	44.7	100.0
Total	38	100.0	100.0	

AI reduces project costs through optimized resource utilization (planning)

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid 3=Neutral	8	21.1	21.1	21.1
4=Agree	16	42.1	42.1	63.2
5=Strongly Agree	14	36.8	36.8	100.0
Total	38	100.0	100.0	

AI enhances risk identification and mitigation strategies (execution)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	3=Neutral	5	13.2	13.2	13.2
	4=Agree	13	34.2	34.2	47.4
	5=Strongly Agree	20	52.6	52.6	100.0
	Total	38	100.0	100.0	

Inadequate IT infrastructure and systems compatibility

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 = Not a barrier	2	5.3	5.3	5.3
	2 = Minor barrier	1	2.6	2.6	7.9
	3 = Moderate barrier	6	15.8	15.8	23.7
	4 = Significant barrier	13	34.2	34.2	57.9
	5 = Major barrier	16	42.1	42.1	100.0
	Total	38	100.0	100.0	

Limited internet connectivity and bandwidth

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 = Not a barrier	3	7.9	7.9	7.9
	2 = Minor barrier	2	5.3	5.3	13.2
	3 = Moderate barrier	8	21.1	21.1	34.2
	4 = Significant barrier	15	39.5	39.5	73.7
	5 = Major barrier	10	26.3	26.3	100.0
	Total	38	100.0	100.0	

Insufficient data quality and standardization

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 = Not a barrier	3	7.9	7.9	7.9

	2 = Minor barrier	2	5.3	5.3	13.2
	3 = Moderate barrier	9	23.7	23.7	36.8
	4 = Significant barrier	7	18.4	18.4	55.3
	5 = Major barrier	17	44.7	44.7	100.0
	Total	38	100.0	100.0	

High initial investment and implementation costs

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 = Not a barrier	1	2.6	2.6	2.6
	2 = Minor barrier	2	5.3	5.3	7.9
	3 = Moderate barrier	10	26.3	26.3	34.2
	4 = Significant barrier	14	36.8	36.8	71.1
	5 = Major barrier	11	28.9	28.9	100.0
	Total	38	100.0	100.0	

Limited budget allocation for AI technology

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 = Not a barrier	2	5.3	5.3	5.3
	2 = Minor barrier	1	2.6	2.6	7.9
	3 = Moderate barrier	8	21.1	21.1	28.9
	4 = Significant barrier	12	31.6	31.6	60.5
	5 = Major barrier	15	39.5	39.5	100.0
	Total	38	100.0	100.0	

Resistance to change among healthcare professionals

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 = Not a barrier	5	13.2	13.2	13.2
	2 = Minor barrier	1	2.6	2.6	15.8
	3 = Moderate barrier	8	21.1	21.1	36.8

		13	34.2	34.2	71.1
4 = Significant barrier					
5 = Major barrier		11	28.9	28.9	100.0
Total		38	100.0	100.0	

Insufficient AI training programs and capacity building

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 = Not a barrier	3	7.9	7.9	7.9
	2 = Minor barrier	1	2.6	2.6	10.5
	3 = Moderate barrier	7	18.4	18.4	28.9
	4 = Significant barrier	11	28.9	28.9	57.9
	5 = Major barrier	16	42.1	42.1	100.0
	Total	38	100.0	100.0	

Lack of clear AI strategy and implementation roadmap

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 = Not a barrier	1	2.6	2.6	2.6
	2 = Minor barrier	2	5.3	5.3	7.9
	3 = Moderate barrier	9	23.7	23.7	31.6
	4 = Significant barrier	11	28.9	28.9	60.5
	5 = Major barrier	15	39.5	39.5	100.0
	Total	38	100.0	100.0	

Organizational culture resistant to technological change

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 = Not a barrier	3	7.9	7.9	7.9
	2 = Minor barrier	1	2.6	2.6	10.5
	3 = Moderate barrier	13	34.2	34.2	44.7
	4 = Significant barrier	10	26.3	26.3	71.1
	5 = Major barrier	11	28.9	28.9	100.0

	Total	38	100.0	100.0	

Lack of government policies and regulatory guidelines for AI

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 = Not a barrier	2	5.3	5.3	5.3
	3 = Moderate barrier	7	18.4	18.4	23.7
	4 = Significant barrier	11	28.9	28.9	52.6
	5 = Major barrier	18	47.4	47.4	100.0
	Total	38	100.0	100.0	

Data privacy and security compliance requirements

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 = Not a barrier	2	5.3	5.3	5.3
	3 = Moderate barrier	10	26.3	26.3	31.6
	4 = Significant barrier	11	28.9	28.9	60.5
	5 = Major barrier	15	39.5	39.5	100.0
	Total	38	100.0	100.0	

Limited availability of healthcare-specific AI solutions

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 = Not a barrier	2	5.3	5.3	5.3
	2 = Minor barrier	3	7.9	7.9	13.2
	3 = Moderate barrier	6	15.8	15.8	28.9
	4 = Significant barrier	14	36.8	36.8	65.8
	5 = Major barrier	13	34.2	34.2	100.0
	Total	38	100.0	100.0	

Adequate funding and budget allocation

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid 5 = Critical requirement	21	55.3	55.3	55.3
3 = Moderately important	4	10.5	10.5	65.8
4 = Very important	13	34.2	34.2	100.0
Total	38	100.0	100.0	

Skilled AI professionals and project managers

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid 5 = Critical requirement	19	50.0	50.0	50.0
1 = Not important	1	2.6	2.6	52.6
2 = Slightly important	2	5.3	5.3	57.9
3 = Moderately important	8	21.1	21.1	78.9
4 = Very important	8	21.1	21.1	100.0
Total	38	100.0	100.0	

Robust IT infrastructure and systems

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid 5 = Critical requirement	15	39.5	39.5	39.5
2 = Slightly important	1	2.6	2.6	42.1
3 = Moderately important	4	10.5	10.5	52.6
4 = Very important	18	47.4	47.4	100.0
Total	38	100.0	100.0	

Comprehensive staff training programs

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid 5 = Critical requirement	16	42.1	42.1	42.1
3 = Moderately important	7	18.4	18.4	60.5

4 = Very important	15	39.5	39.5	100.0
Total	38	100.0	100.0	

Clear AI implementation strategy and roadmap

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	5 = Critical requirement	15	39.5	39.5	39.5
	1 = Not important	1	2.6	2.6	42.1
	3 = Moderately important	5	13.2	13.2	55.3
	4 = Very important	17	44.7	44.7	100.0
	Total	38	100.0	100.0	

Government policy support and incentives

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	5 = Critical requirement	17	44.7	44.7	44.7
	3 = Moderately important	3	7.9	7.9	52.6
	4 = Very important	18	47.4	47.4	100.0
	Total	38	100.0	100.0	

Reliable technical support and maintenance

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	5 = Critical requirement	15	39.5	39.5	39.5
	1 = Not important	1	2.6	2.6	42.1
	3 = Moderately important	7	18.4	18.4	60.5
	4 = Very important	15	39.5	39.5	100.0
	Total	38	100.0	100.0	

Proven AI tools specifically for healthcare projects

	Frequency	Percent	Valid Percent	Cumulative Percent

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	5 = Critical requirement	18	47.4	47.4	47.4
	2 = Slightly important	1	2.6	2.6	50.0
	3 = Moderately important	7	18.4	18.4	68.4
	4 = Very important	12	31.6	31.6	100.0
	Total	38	100.0	100.0	

Strong leadership commitment and vision

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	5 = Critical requirement	20	52.6	52.6	52.6
	2 = Slightly important	3	7.9	7.9	60.5
	3 = Moderately important	7	18.4	18.4	78.9
	4 = Very important	8	21.1	21.1	100.0
	Total	38	100.0	100.0	

Gradual implementation and change management

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	5 = Critical requirement	13	34.2	34.2	34.2
	1 = Not important	1	2.6	2.6	36.8
	3 = Moderately important	9	23.7	23.7	60.5
	4 = Very important	15	39.5	39.5	100.0
	Total	38	100.0	100.0	

Concerns

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Cost	5	13.2	13.2	13.2
	Job security	7	18.4	18.4	31.6
	Privacy	6	15.8	15.8	47.4
	Reliability	8	21.1	21.1	68.4

	Frequency	Percent	Valid Percent	Cumulative Percent
Technical complexity	12	31.6	31.6	100.0
Total	38	100.0	100.0	

Impact

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	2=slightly	1	2.6	2.6	2.6
	3=moderately	2	5.3	5.3	7.9
	4=highly	21	55.3	36.8	44.7
	5=Completely	14	36.8	55.3	100.0
	Total	38	100.0	100.0	

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.699[a]	.489	.428	.43511

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2.263	1	2.263	11.956	.001[b]
	Residual	6.815	36	.189		
	Total	9.079	37			

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.527	.320		7.901	.000
	AI	.253	.073	.499	3.458	.001

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.761[a]	.579	.4521	.51974

ANOVAᵃ

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	7.538	1	7.538	27.907	.000[b]
	Residual	9.725	36	.270		
	Total	17.263	37			

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.613	.175		20.695	.000
	a	.269	.051	.661	5.283	.000

a. Dependent Variable: c

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.741[a]	.549	.513	.58233

ANOVAᵃ

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	5.055	1	5.055	14.908	.000[b]
	Residual	12.208	36	.339		
	Total	17.263	37			

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.

		B	Std. Error	Beta		
1	(Constant)	3.201	.330		9.709	.000
	AI	.279	.072	.541	3.861	.000

Challenges	M							Remark	Rank
Inadequate IT infrastructure	16	13	6	1	2	38	4.052632	Significant Barrier	80
Limited internet connectivity and bandwidth	10	15	8	2	3	38	3.710526	Significant Barrier	50
Insufficient data quality and standardization	17	7	9	2	3	38	3.868421	Significant Barrier	85
High initial investment and implementation costs	11	14	10	2	1	38	3.842105	Significant Barrier	55
Limited budget allocation for AI technology	15	12	8	1	2	38	3.973684	Significant Barrier	75
Resistance to change among healthcare professionals	11	13	8	1	5	38	3.631579	Significant Barrier	55
Insufficient AI training programs and capacity building	16	11	7	1	3	38	3.947368	Significant Barrier	80
Lack of clear AI strategy and implementation roadmap	15	11	9	2	1	38	3.973684	Significant Barrier	75
Organizational culture resistant to technological change	11	10	13	1	3	38	3.657895	Significant Barrier	55
Lack of government policies and	18	11		0		38	4.131579	Significant Barrier	90

regulatory guidelines for AI			7		2				
Data privacy and security compliance requirements	15	11	10	0	2	38	3.973684	Significant Barrier	75
Limited availability of healthcare-specific AI solutions	13	14	6	3	2	38	3.868421	Significant Barrier	65

APPENDIX IV
SAMPLE INTERVIEW TRANSCRIPT

Participant	Dialogue / Response
Interviewer	Hello, good morning. I want to conduct this interview as part of my master's research at Vilnius University. The purpose of the study is to explore how Artificial Intelligence can support project management practice in the Nigerian healthcare sector, focusing on both its opportunities and the challenges faced during implementation. So, I would like to ask some follow-up questions, and the first one is: what's your gender?
R1	I'm female.
Interviewer	Okay, thank you for that. And the second question is, what is your age range?
R1	I'm in my late twenties.
Interviewer	And for how long have you been working in the healthcare sector?
R1	For over 8–9 years.
Interviewer	Okay, so moving to the second section, which is about personal experience with AI and project management. Could you please share your idea of Artificial Intelligence, that is, what do you understand about Artificial Intelligence?

R1	Okay, I think it's basically when computers are designed to perform tasks that require human thinking, analyzing data and making decisions for us.
Interviewer	Thank you. Can you give me an example of AI that you've encountered in healthcare?
R1	Basically, CT scans and radiology. advanced AI is used to detect any signs of disease. Also, for data analysis, we use tools like SPSS or Excel.
Interviewer	Okay. And what concerns, if any, do you have about AI in healthcare?
R1	None really. I think it helps, especially in radiology, it helps in detecting diseases and managing lab results. It also helps in analyzing data quickly. Instead of using calculators to get urgent results, AI speeds up the process.
Interviewer	Okay, thank you. And the next question, what do you understand about project management?
R1	It's basically the process of planning, organizing, and managing data within a time constraint to achieve specific project goals. Budget management also plays a key role.
Interviewer	Okay. What are the biggest challenges you face in managing healthcare projects?
R1	Manpower and training. Training healthcare workers for a project can take time because they need to understand how to use the tools before implementation. Funding can also be a challenge. It might not be sufficient, and getting everyone across departments to align is another major challenge.
Interviewer	Okay, thank you for that. Can you describe a recent project you've worked on and its outcomes, maybe a recent one in healthcare?

R1	I'm currently working on a project funded by the Global Fund. We have different sites and teams across departments. Some people work in the field, visiting different locations to collect mosquitoes. It's not just in Lagos — there are sites across various states. Data such as the number of mosquitoes collected per day or hour must be recorded within a set timeframe. Once the mosquitoes are brought to the lab, we dissect and analyze them to identify species and determine areas and conditions (like temperature) where mosquitoes are most prevalent. The main aim of the project is to eradicate mosquitoes in Nigeria. It's an ongoing process — we test different insecticides and repellents. At one point, there was a breakthrough with an insecticide called Good Knight, which worked well initially, but later mosquitoes developed resistance, so testing continues. We even have a mosquito farm where we feed them with human blood and glucose for research. It's quite interesting and ongoing.
Interviewer	Thank you for sharing that experience. Based on your personal experience, how has AI influenced project management in the Nigerian healthcare context?
R1	AI is gradually being introduced into the Nigerian health sector. Previously, everything was done manually — prescriptions, records, etc. But now, hospitals like mine have introduced centralized data platforms. You can now schedule appointments with doctors, get prescriptions, and pick up drugs from the pharmacy — all digitally. I've also worked in the HIV and CD clinics where computerized scheduling has reduced chaos. Patients now know when to come and don't have to queue unnecessarily. Everything is more orderly now.
Interviewer	Thank you for that. What barriers prevent wider AI adoption in Nigeria?
R1	Network issues are a major problem — when the network is down, everyone reverts to paper. Lack of maintenance is another issue. Some hospitals can't afford it because it's expensive to maintain. Infrastructure challenges, like irregular power supply, also make it difficult. In my facility, we now use solar panels to keep systems running during working hours so that operations aren't disrupted. It's all part of ensuring patient satisfaction.

Interviewer	Okay, thank you. How does the Nigerian context differ from what you know about AI use elsewhere?
R1	Other countries don't usually face infrastructure or power issues, so things run smoothly. Here in Nigeria, we're still learning and undergoing training to catch up with international standards and make things more efficient.
Interviewer	Thank you. Moving to the last section — AI as a project management assistant. Do you believe AI can improve project management in Nigeria?
R1	Yes, AI can help in project management, especially with data reporting. It saves time, reduces human error, and helps with resource allocation.
Interviewer	In your opinion, how could AI enhance project management in the Nigerian healthcare system?
R1	It can help analyze large volumes of health data — which we have a lot of in Nigeria. It can identify risks, support quick decision-making, and enable real-time project monitoring. That way, instead of asking for updates, you can simply check online and see progress instantly.
Interviewer	Based on your experience, how would you rate the current level of AI usage in healthcare project delivery in Nigeria?
R1	I think we're at a middle stage now. There's been progress, and more people are adapting.
Interviewer	Do you think AI adoption has a significant impact on project management success in Nigerian healthcare institutions? Please give reasons.
R1	Yes, I think it does. Where AI tools are used, project teams tend to be more efficient and can make quicker, data-driven decisions instead of relying on manual reports.
Interviewer	Based on your experience, how would you rate the effectiveness of AI in enhancing project management in the Nigerian healthcare sector?

R1	Like I said, we're still at a middle stage, but it's promising. We're not yet at an advanced stage, but we're getting there. With more training, policies, proper implementation, and adequate funding, the potential is high.
Interviewer	What challenges do you feel are preventing the effective implementation of AI in Nigerian healthcare project management?
R1	Poor infrastructure, lack of technical know-how, and inadequate training. People also resist change — many are used to manual methods and are not computer literate. And there's limited government support.
Interviewer	Okay, thank you. That's the end of my questions. I really appreciate your insightful responses — they'll be very helpful for my research. Thank you for your time.
R1	You're welcome. Thank you.