Role of Artificial Intelligence in Analysing and Monitoring Reputation of University's Ranking in North Central Nigeria

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DOI: https://doi.org/10.47772/IJRISS.2026.100400427

Received: 18 April 2026; Accepted: 23 April 2026; Published: 13 May 2026

ABSTRACT

The adoption of artificial intelligence (AI) in higher education has emerged as a critical strategy for enhancing institutional performance, reputation, and competitiveness. In Nigeria, universities face increasing pressure to improve research output, operational efficiency, and stakeholder engagement, all of which influence national and international ranking. This study examines the role of AI in analysing and monitoring the reputation and ranking of the University of Agriculture, Makurdi, with the objective of assessing the effect of AI tools for data analysis and performance monitoring on university ranking and the extent to which AI-driven reputation and sentiment analysis influences stakeholders' perceptions. The study is anchored on the Technology Acceptance Model (TAM), which posits that perceived usefulness and ease of use determine the adoption of technology and its subsequent impact on organisational outcomes. A documentary research design was adopted, utilizing secondary data including administrative records, published ranking reports, AI implementation documents, and stakeholder feedback from 2019 to 2024. Quantitative data were analyzed using descriptive and inferential statistics, while qualitative insights from reports were subjected to thematic content analysis. Findings indicate that AI adoption has significantly improved research productivity, administrative efficiency, and national ranking, demonstrating a positive relationship between AI tools and institutional performance metrics. Similarly, AI-based reputation and sentiment analysis enhanced stakeholder perception, with measurable improvements in student satisfaction, alumni engagement, and public/media sentiment, resulting in a strengthened institutional reputation. Based on these findings, the study recommends sustained investment in AI infrastructure, capacity-building initiatives for staff, and the implementation of comprehensive AI-driven reputation management systems to optimise institutional performance and stakeholder engagement. The study concludes that AI is a strategic tool for advancing both tangible outcomes such as ranking and intangible outcomes such as reputation in Nigerian universities.

Keywords: Artificial intelligence, university ranking, reputation management, sentiment analysis, higher education.

INTRODUCTION

Globally, the role of artificial intelligence (AI) in higher education has gained substantial attention as universities and academic institutions strive to enhance their visibility, competitiveness, and ranking in an increasingly data-driven world. According to Chen et al. (2022), AI tools have been instrumental in analysing large volumes of data generated from research outputs, student performance, and institutional activities, enabling universities to track and improve their global standing. Machine learning algorithms and natural language processing (NLP) applications facilitate the identification of trends, patterns, and public perceptions about universities, which are critical components in reputation management. Furthermore, global ranking systems such as Times Higher Education (THE), QS World University Rankings, and Academic Ranking of World Universities (ARWU) rely heavily on metrics that AI can help monitor and interpret efficiently (Marginson, 2021). As higher education becomes increasingly internationalised, the adoption of AI-driven

analytics has proven essential for institutions seeking to improve their global competitiveness, optimise resource allocation, and strengthen engagement with stakeholders including students, faculty, and alumni (Sung et al., 2023). Globally, recent statistics indicate that over 60% of top-ranked universities now utilise AI-powered dashboards and analytic tools to assess their research visibility and public perception, emphasizing the transformative role of AI in the strategic management of institutional reputation (OECD, 2022).

In Africa, the adoption of AI in higher education, particularly in reputation management and ranking analysis, is gradually gaining momentum, although it remains uneven across the continent. Studies by Okoye and Olayinka (2021) highlight that African universities face challenges such as limited digital infrastructure, inadequate data management systems, and insufficient technical expertise, which hinder the optimal use of AI in monitoring institutional reputation. Nevertheless, AI applications have been piloted in countries like South Africa, Kenya, and Egypt to enhance research visibility, automate citation tracking, and monitor online perceptions of universities (Munyai, 2020). For example, South African universities have employed AI algorithms to analyse social media sentiment and digital media mentions, helping institutions better understand their standing in both local and international contexts (Khumalo, 2021). Despite these advancements, Africa still lags behind developed regions in the integration of AI for university ranking analysis, highlighting a critical gap and the potential for AI to contribute significantly to strategic decision-making and reputation management across the continent.

In the Nigerian context, AI adoption in university management and ranking analysis has become increasingly important due to the growing demand for higher education quality and global recognition. Nigeria, being home to over 200 universities (National Universities Commission [NUC], 2023), faces the challenge of positioning its institutions within competitive global and African rankings. Studies by Akinlade and Bello (2022) emphasize that Nigerian universities are increasingly exploring digital tools, including AI, to track research outputs, publications, and online engagement metrics, which are critical determinants of institutional reputation. For instance, Ahmadu Bello University, University of Ibadan, and University of Lagos have begun experimenting with AI-driven data analytics to enhance their strategic planning and visibility in global rankings (Eze & Adeyemi, 2023). Reports suggest that universities using AI tools have observed measurable improvements in research dissemination, citation counts, and stakeholder engagement, reflecting the potential of AI to bridge gaps in institutional performance monitoring (Okeke, 2022). Despite these efforts, widespread adoption remains limited, particularly in the North-Central region, where infrastructural challenges and limited technical expertise continue to impede full-scale integration of AI into university management practices.

Focusing specifically on the North-Central region of Nigeria, the role of AI in analysing and monitoring university rankings is even more critical due to the region's evolving educational landscape. States such as Plateau, Benue, and Niger host universities that are striving to improve their competitiveness both nationally and internationally. According to Musa and Garba (2023), universities in this region face challenges related to data fragmentation, low online visibility, and limited research collaboration, all of which affect their performance in national and global ranking indices. Preliminary studies indicate that AI-powered analytics could assist these universities in monitoring digital reputation, understanding stakeholder perceptions, and strategically improving performance metrics such as research output, graduate employability, and international collaborations (Abdullahi, 2022). Furthermore, AI can facilitate real-time sentiment analysis on social media platforms, track citations, and benchmark institutional performance against peer universities, thereby providing actionable insights for academic leaders (Ibrahim, 2023). This study, therefore, seeks to examine the role of artificial intelligence in analysing and monitoring the reputation of universities' ranking in North-Central Nigeria, aiming to provide insights into how AI adoption can enhance institutional visibility, competitiveness, and strategic decision-making in the region.

Statement of the problem

The integration of artificial intelligence (AI) in higher education has become a transformative strategy for improving institutional performance and visibility. AI enables universities to collect, process, and analyse large volumes of data, providing insights into research outputs, academic performance, and public perception, AI-driven analytics are increasingly used to monitor universities' digital presence, track citations, and assess stakeholder sentiment, all of which influence ranking outcomes.

In Nigeria, AI applications remain limited but show promise, particularly in tracking institutional performance metrics and enhancing online visibility in first generation universities like University of Lagos, University of Ibadan and University of Zaria. But same cannot be said about universities in North-Central Nigeria considered as second generation such as University of Agriculture Makurdi, University of Jos and Federal University of Science and Technology, Lokoja. This study, therefore, aims to explore existing gap in universities in the North Central Nigeria and find out the adoption of AI influences the analysis and monitoring of universities' reputation and ranking in the region.

Before the establishment or the existence of artificial intelligence (AI) in university management, the practical challenges of monitoring and enhancing university reputation and ranking were significant. Universities in North-Central Nigeria faced difficulties in tracking research outputs, measuring stakeholder perceptions, and analyzing institutional performance data (Eze & Adeyemi, 2023). Traditional methods such as manual data collection, surveys, and citation tracking were often time-consuming, inconsistent, and prone to errors, limiting the ability of institutions to make timely and strategic decisions (Okeke, 2022). This is because the importance of AI-driven strategies such as machine learning algorithms, natural language processing, and automated dashboards in providing real-time analytics, monitoring stakeholder sentiment, and benchmarking institutional performance cannot be overemphasized. Despite the relevance of these AI strategies, their impact on university reputation and ranking has not been adequately assessed in the Nigerian context, especially in the North-Central region, leaving a gap in knowledge regarding their effectiveness (Musa & Garba, 2023).

Empirical studies have highlighted the potential of AI in higher education but offer limited evidence on its practical effects on university ranking and reputation. For instance, Chen, Zhang, and Wang (2022) demonstrate globally that AI facilitates large-scale data analysis and visibility tracking for universities, yet the study focuses on developed countries with advanced digital infrastructures. Similarly, Khumalo (2021) examines AI applications in South African universities, highlighting improvements in research monitoring and public perception, but does not explore North-Central Nigeria. Akinlade and Bello (2022) investigate AI adoption in Nigerian universities, showing its promise in performance tracking, but the study does not specifically assess its influence on ranking or reputation metrics. These few studies underscore the importance of AI in institutional management; however, there remains a lack of context-specific evidence on its impact in North-Central Nigeria.

Out of these limited empirical studies, only few examine the effect of artificial intelligence adoption on the reputation and ranking of universities in North-Central Nigeria. The statement of the problem, therefore, is to ascertain whether the independent variable artificial intelligence adoption has enhanced the dependent variable, university reputation and ranking, in the context of higher education institutions in this region. Addressing this problem is critical, given the need for data-driven strategies to improve institutional visibility, stakeholder engagement, and competitiveness in national and international university rankings (Abdullahi, 2022; Musa & Garba, 2023; Okeke, 2022).

Objective of the study

The objectives of the study are to;

. Examine the influence of AI tools for data analysis and performance monitoring on the ranking of universities in North-Central Nigeria.
. Assess the reputational trends before implementation of AI for monitoring and the stakeholders' perceptions in universities in North-Central Nigeria.

LITERATURE OF REVIEW

Artificial Intelligence (AI)

Artificial Intelligence (AI) is broadly defined as the simulation of human intelligence processes by computer systems, enabling machines to perform tasks that typically require human cognitive functions such as learning, reasoning, problem-solving, and decision-making (Russell & Norvig, 2021). In higher education, AI

encompasses a variety of technologies, including machine learning, natural language processing, expert systems, and predictive analytics, which collectively enhance data-driven decision-making and institutional management (Chen, Zhang, & Wang, 2022). The primary function of AI in educational settings is to process and analyze large volumes of data efficiently, providing insights that support strategic planning, performance monitoring, and the optimization of academic and administrative functions.

In recent years, AI has evolved from simple automation tools to sophisticated systems capable of predicting trends, identifying patterns, and even interpreting stakeholder sentiment in real time (Sung, Lee, & Kim, 2023). For universities, this capability translates into more accurate assessment of research outputs, teaching quality, and overall institutional reputation. AI facilitates automated monitoring of publications, citations, and online visibility, which are critical for understanding and enhancing a university's global and national ranking (OECD, 2022). The ability to generate actionable insights from complex datasets distinguishes AI from traditional statistical methods, allowing institutions to respond promptly to emerging challenges and opportunities.

Furthermore, AI is increasingly employed in reputation management through sentiment analysis, social media monitoring, and public opinion tracking (Musa & Garba, 2023). These applications help universities gauge stakeholders' perceptions, identify areas of strength or weakness, and implement targeted interventions to improve institutional image. By integrating AI into governance and operational processes, universities can achieve higher levels of efficiency, accountability, and competitiveness.

Despite its transformative potential, AI adoption in universities, particularly in developing regions, faces challenges such as inadequate infrastructure, limited technical expertise, and data privacy concerns (Akinlade & Bello, 2022). Nonetheless, the growing evidence suggests that AI is a critical tool for modern higher education institutions aiming to enhance institutional performance, visibility, and strategic decision-making.

In the context of North-Central Nigeria, conceptualizing AI involves understanding both its technical capabilities and its strategic applications in monitoring university rankings and reputation, highlighting its role as an enabler of evidence-based decision-making and institutional growth.

University Reputation

University reputation is a multidimensional construct that reflects the collective perception of a higher education institution among its stakeholders, including students, faculty, employers, policymakers, and the general public. It encompasses the quality of teaching, research output, societal impact, and the ethical and professional standards upheld by the institution (Hazelkorn, 2018). Reputation serves as a critical determinant of a university's ability to attract high-quality students, faculty, research funding, and international collaborations, ultimately influencing its competitiveness both nationally and globally. It is often shaped by tangible indicators such as research publications, citations, accreditation status, graduate employability, and awards, as well as intangible factors like institutional culture, leadership, and alumni achievements (Jiang & Zhang, 2020).

In the digital era, university reputation is increasingly mediated by online visibility, social media presence, and stakeholder sentiment expressed across digital platforms (Santos et al., 2021). Universities are now evaluated not only on traditional academic metrics but also on their engagement with stakeholders through websites, social media, and online forums. Studies indicate that positive online engagement and transparency in institutional processes significantly enhance perceived reputation (Abubakar et al., 2022). Conversely, negative publicity or inadequate digital engagement can quickly erode stakeholder confidence, affecting both domestic and international ranking positions.

Reputation is closely linked with university ranking systems, which use both qualitative and quantitative measures to position universities relative to peers (Marginson, 2021). However, reputation extends beyond formal ranking; it is also shaped by experiential factors such as the quality of student-teacher interactions, community engagement, and responsiveness to societal needs. Institutions with strong reputations often

demonstrate consistency in research excellence, strategic leadership, and ethical governance, which in turn reinforces trust among stakeholders and promotes institutional sustainability (Akinlade & Bello, 2022).

In the context of North-Central Nigeria, university reputation remains a critical factor in attracting students and faculty amidst growing competition and limited resources. Given the challenges of fragmented data, low online visibility, and limited international exposure, leveraging innovative tools such as artificial intelligence for monitoring and enhancing reputation becomes crucial. AI-driven analytics can provide real-time insights into stakeholder perceptions, track media coverage, and identify trends, enabling institutions to develop targeted strategies for improving reputation and aligning institutional goals with global standards.

University Ranking.

University ranking is a systematic assessment of higher education institutions based on specific performance indicators, aimed at comparing their academic, research, and societal impact (Hazelkorn, 2019). Rankings serve as a benchmark for universities to evaluate their competitiveness locally and internationally, guiding stakeholders including students, faculty, policymakers, and employers in decision-making processes. They also provide insights into institutional strengths and weaknesses, helping universities to allocate resources strategically and improve quality (Marginson, 2021). Globally recognized ranking systems such as Times Higher Education (THE), QS World University Rankings, and Academic Ranking of World Universities (ARWU) rely on metrics including research output, citation impact, teaching quality, international collaboration, and graduate employability. These systems are increasingly data-driven, requiring accurate collection and analysis of institutional data to ensure reliable ranking results.

In recent years, the significance of university ranking has expanded beyond mere institutional prestige to influencing funding allocation, international partnerships, and student recruitment (Hazelkorn, 2019; Sung et al., 2023). A high-ranking position often translates into enhanced visibility, reputation, and the ability to attract talented faculty and students. Conversely, lower-ranked institutions may struggle with diminished recognition and fewer opportunities for collaboration and resource acquisition. In Africa, rankings have highlighted disparities between universities in terms of infrastructure, research capacity, and digital adoption, reinforcing the need for systematic strategies to enhance institutional performance (Okoye & Olayinka, 2021).

University ranking is not solely quantitative; qualitative aspects such as stakeholder perception, online reputation, and social influence are increasingly considered, particularly in modern, AI-enhanced ranking approaches. These dimensions underscore that reputation and public perception are critical factors influencing ranking outcomes (Chen et al., 2022). For Nigerian universities, ranking provides a mirror of institutional effectiveness and global competitiveness. However, challenges such as limited research output, low international collaboration, and inadequate online presence affect their performance in ranking indices, particularly for universities in regions like North-Central Nigeria (Musa & Garba, 2023). Consequently, ranking has become a strategic tool for institutional improvement, policy formulation, and data-driven decision-making in higher education.

In sum, university ranking is both a measure of institutional performance and a mechanism for enhancing competitiveness. It encompasses quantitative metrics like research output and graduate employability, as well as qualitative dimensions such as reputation and stakeholder perception. For universities in North-Central Nigeria, ranking remains an essential indicator of institutional success and a catalyst for adopting innovative strategies, including AI-driven analytics, to improve performance and visibility.

Data Analysis and Performance Monitoring

Data analysis and performance monitoring refer to systematic processes through which organizations collect, process, and interpret data to evaluate performance, identify trends, and inform decision-making (Kshetri, 2018). In the context of higher education, universities generate vast amounts of data daily, including student academic records, research outputs, faculty productivity, and institutional activities. Without effective analysis, such data remains underutilized, limiting the ability of universities to assess their performance or make strategic decisions to improve academic quality and competitiveness.

Performance monitoring involves tracking key performance indicators (KPIs) over time to ensure that institutions meet their objectives and adhere to quality standards. It often incorporates metrics such as research publications, student graduation rates, faculty performance, funding utilization, and stakeholder engagement (Santos & Silva, 2020). By monitoring these indicators, university management can detect areas of strength and weakness, allocate resources more effectively, and implement policies that enhance institutional outcomes.

The integration of artificial intelligence (AI) into data analysis and performance monitoring has transformed how universities approach institutional management. AI-enabled systems can automate data collection, perform predictive analytics, and generate real-time dashboards, making performance tracking more efficient and accurate (Chen, Zhang, & Wang, 2022). For instance, AI tools can analyze research productivity trends, track citations, and benchmark institutional performance against peer universities. This allows higher education managers to make data-driven decisions and strategically improve university rankings and reputation.

In addition, performance monitoring using AI can enhance transparency and accountability within universities. Automated systems reduce human error and bias, ensuring that evaluations are consistent and evidence-based. Furthermore, AI-driven analytics provide actionable insights that guide policy formulation, faculty development programs, and student support initiatives (Okeke, 2022).

Despite these advantages, the adoption of AI for data analysis and performance monitoring in some regions, including North-Central Nigeria, remains limited due to infrastructural and technical challenges. Nevertheless, the potential of AI-powered systems to transform institutional performance management is widely recognized, making them critical tools for universities seeking to enhance competitiveness, efficiency, and reputation (Musa & Garba, 2023).

Reputation and Sentiment Analysis

The concept of **reputation** for a university refers to the collective judgement and perception held by various stakeholders students, alumni, employers, the public, and academic peers about the institution's quality, credibility, performance, and value. Reputation is multifaceted, encompassing perceptions of academic quality, research output, employability of graduates, institutional governance, public image, online presence, and stakeholder trust. In a digital age where information flows quickly via the internet and social media, a university's reputation is no longer only constructed through traditional outputs (publications, accreditation, employer feedback) but also through what is expressed publicly in forums, social media, online reviews, and media coverage. Sentiment and public opinion about the university therefore become key to understanding and measuring reputation beyond quantitative ranking metrics.

Sentiment analysis (also called opinion mining) is a computational method often using artificial intelligence (AI), natural language processing (NLP), and machine learning to systematically collect, process, and interpret textual data (e.g., social media posts, comments, reviews, feedback) to determine the emotional tone or attitude expressed (positive, negative, or neutral), as well as more nuanced states (e.g., joy, anger, satisfaction). In the educational sector, sentiment analysis has been increasingly applied: for example, institutions gather student feedback, social media mentions, and public discourse about the university to evaluate stakeholders' perceptions and sentiments regarding institutional reputation, quality of teaching, facilities, and overall value. (journalspress.uk)

When sentiment analysis is combined with reputation management i.e., **"**reputation and sentiment analysis**"** it becomes a strategic tool for institutions (including universities) to monitor their public image, detect and respond to negative or positive trends, benchmark themselves against competitors, and guide decisions on communication, quality improvement, and policy. A conceptual model proposed by Nwabekee, Okpeke & Onalaja (2024) presents a framework where data acquisition (from social media, reviews, forums), sentiment classification (positive/neutral/negative), contextual analysis (to understand nuance), and actionable insights feed into reputation management strategies. By doing so, institutions can respond early to negative public perceptions, amplify positive feedback, and align institutional strategies with stakeholder expectations.

In the context of higher education, reputation and sentiment analysis therefore link intangible aspects stakeholder perceptions, social media discourse, online presence with more traditional performance measures (research output, rankings, accreditation). This conceptualization underscores that a university's "reputation" is dynamic and socially constructed, shaped not just by formal metrics but by public dialogue and sentiments. For a study examining the role of AI in analysing and monitoring reputation and university ranking especially in regions like North-Central Nigeria integrating reputation and sentiment analysis offers a holistic, contemporary way to capture how universities are perceived beyond formal ranking criteria

Empirical Review

Effect of Artificial Intelligence tools for data analysis and performance monitoring on the ranking of Universities

Akinlade and Bello (2022) investigates the adoption of artificial intelligence (AI) technologies in Nigerian universities and their role in facilitating digital transformation. The research adopts a descriptive survey design, collecting data from 150 academic and administrative staff across five Nigerian universities through structured questionnaires and interviews. The study specifically examines the extent of AI adoption, the perceived benefits in university operations, and the challenges encountered during implementation. Findings indicate that AI tools, including automated data analytics platforms, performance monitoring systems, and intelligent administrative applications, have significantly improved decision-making processes, research tracking, and teaching effectiveness. Staff respondents reported enhanced efficiency in monitoring academic performance and institutional productivity, suggesting a positive relationship between AI adoption and organizational performance metrics. However, the study also identifies critical challenges, such as inadequate technical infrastructure, limited AI literacy among staff, and insufficient funding for technology deployment, which constrain full-scale implementation. The authors conclude that while AI adoption holds substantial promise for transforming Nigerian universities, strategic policies, capacity-building initiatives, and investment in digital infrastructure are essential to realize its full potential. The study contributes to the growing body of knowledge on digital transformation in African higher education and provides practical recommendations for university administrators seeking to leverage AI for improved institutional performance, competitiveness, and innovation.

Eze and Adeyemi (2023) examines the role of data analytics in enhancing the performance and ranking of Nigerian universities. The research investigates how the systematic use of data-driven tools can support decision-making, optimize resource allocation, and monitor academic productivity, thereby contributing to improved institutional outcomes. Employing a mixed-method approach, the study collected quantitative data from administrative records, research outputs, and academic performance metrics, complemented by qualitative insights from interviews with university administrators and faculty. The findings reveal that universities that integrate data analytics tools into their management systems demonstrate measurable improvements in research visibility, teaching quality, and operational efficiency, all of which are key indicators in university ranking frameworks. Furthermore, the study highlights that data analytics facilitates real-time performance monitoring, enabling institutions to identify strengths and weaknesses, respond promptly to challenges, and benchmark their performance against peer institutions. Despite these positive impacts, the research identifies challenges, including limited technical expertise, insufficient infrastructure, and resistance to digital transformation, which hinder the full potential of analytics adoption. The study concludes that the strategic implementation of data analytics is instrumental in enhancing university rankings in Nigeria, providing actionable recommendations for policymakers, institutional leaders, and stakeholders. By demonstrating the effectiveness of data-driven approaches, this research contributes to the broader discourse on digital transformation in higher education management.

The use of artificial intelligence for reputation and sentiment analysis influences stakeholders' perceptions of universities

Musa and Garba (2023) investigates the relationship between artificial intelligence (AI) adoption and university competitiveness in North-Central Nigeria. The research addresses the increasing need for universities in the region to enhance their performance, visibility, and ranking in national and international

contexts. The study adopts a descriptive survey research design, targeting academic and administrative staff across selected universities in North-Central Nigeria. Data were collected using structured questionnaires and document analysis to assess the extent of AI adoption in institutional processes such as data management, performance monitoring, research tracking, and decision-making. The collected data were analyzed using descriptive statistics, correlation analysis, and regression techniques to determine the impact of AI adoption on key indicators of university competitiveness. Findings reveal that universities that integrate AI tools for data analysis and performance monitoring experience measurable improvements in research productivity, administrative efficiency, and responsiveness to stakeholder needs. The study further indicates that AI-driven analytics significantly influence institutional decision-making, contributing to enhanced visibility and competitiveness within the higher education sector. Despite the positive outcomes, challenges such as inadequate technical expertise, limited infrastructure, and resistance to technological change were identified as barriers to effective AI adoption. The authors conclude that AI adoption is a critical factor for improving the strategic positioning of universities in North-Central Nigeria, particularly in terms of performance metrics, stakeholder engagement, and competitive ranking. The study recommends policy frameworks and capacity-building initiatives to support the systematic integration of AI technologies in higher education management.

Abdullahi (2022) examines the opportunities and challenges associated with AI adoption in Nigerian universities, highlighting its potential to streamline administrative processes, optimize resource allocation, and improve research productivity. The study adopts a descriptive research design, combining qualitative and quantitative methods, including surveys of academic and administrative staff across selected Nigerian universities. Findings indicate that AI tools, such as automated data dashboards, predictive analytics, and natural language processing applications, significantly enhance data-driven decision-making, monitoring of staff and student performance, and overall operational efficiency. Despite these benefits, the study identifies several challenges, including limited technical expertise, inadequate digital infrastructure, and resistance to technological change, which constrain effective AI implementation. Furthermore, Abdullahi (2022) emphasizes that while AI adoption can potentially improve universities' national and international competitiveness, its impact on institutional reputation and ranking remains underexplored. The study recommends targeted training programs for academic and administrative personnel, investment in digital infrastructure, and the development of strategic frameworks for AI integration to maximize its benefits. This research contributes to the growing body of knowledge on AI in higher education management in Africa and underscores the need for context-specific strategies that address local challenges while leveraging AI to enhance institutional effectiveness. The findings are particularly relevant for policymakers, university administrators, and researchers interested in understanding how AI can shape the future of university management in Nigeria and similar developing contexts.

Despite growing evidence on the adoption of artificial intelligence (AI) and data analytics in Nigerian universities, significant gaps remain in the literature. Studies by Akinlade and Bello (2022) and Eze and Adeyemi (2023) highlight the positive impact of AI tools and data-driven analytics on university operations, academic productivity, and performance monitoring, indicating potential improvements in institutional ranking. Similarly, Musa and Garba (2023) and Abdullahi (2022) emphasize the role of AI in enhancing decision-making, administrative efficiency, and competitiveness. However, these studies primarily focus on general AI adoption, operational efficiency, or performance metrics, without explicitly assessing its direct effect on university rankings in North-Central Nigeria. Moreover, while Abdullahi (2022) notes AI's potential influence on institutional reputation, empirical evidence on how AI-driven reputation and sentiment analysis shapes stakeholders' perceptions remains limited. Therefore, there is a critical need for research that specifically examines the impact of AI tools on both the ranking and reputation of universities in the North-Central region of Nigeria.

THEORETICAL FRAMEWORK

Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM) was propounded by Fred Davis in 1989. It was developed to explain and predict user acceptance of information systems (IS) and technology in organizational settings.

TAM emerged from the Theory of Reasoned Action (TRA), adapting its principles specifically for understanding why users accept or reject technological innovations.

TAM posits that the adoption and use of technology are primarily determined by two key perceptions: perceived usefulness (PU) and perceived ease of use (PEOU). Perceived usefulness is the degree to which a person believes that using a particular technology will enhance their job performance, while perceived ease of use refers to the degree to which the technology is free of effort (Davis, 1989). These perceptions shape users' attitude toward using technology, which subsequently influences their behavioral intention to use the technology, and ultimately their actual use. Over time, extensions of TAM (e.g., TAM2, TAM3) have incorporated factors such as social influence, facilitating conditions, and self-efficacy to improve predictive validity (Venkatesh & Bala, 2020).

Basic Assumptions

TAM rests on several assumptions:

i. Individuals make rational decisions regarding technology adoption based on perceived benefits.

ii. The higher the perceived usefulness and ease of use, the more likely the technology will be accepted and integrated into regular practice.

iii. Behavioral intention is a strong predictor of actual technology usage.

iv. External variables, such as organizational support, infrastructure, and training, indirectly influence adoption through their effect on PU and PEOU.

Applicability to the Study

In the context of this study, TAM is highly applicable as it provides a theoretical framework to examine how university staff and administrators adopt AI tools for data analysis, performance monitoring, and reputation management. The model allows the study to explore whether perceived usefulness (e.g., improving ranking, enhancing research tracking) and perceived ease of use (e.g., user-friendly dashboards, automated analytics) influence the extent of AI adoption in universities.

Relevance to the Study

TAM's relevance lies in its ability to link human perceptions and attitudes to technology-driven organizational outcomes. Since the study investigates the role of AI in enhancing university reputation and ranking in North-Central Nigeria, TAM helps explain how staff and administrative acceptance of AI tools affects the effective deployment of these technologies. By applying TAM, the research can assess whether adoption behaviors, influenced by perceived benefits and ease of use, translate into measurable improvements in institutional performance, stakeholder satisfaction, and global visibility (Akinlade & Bello, 2022; Musa & Garba, 2023). Thus, TAM provides both a conceptual and analytical framework for understanding the relationship between AI adoption and university ranking outcomes.

METHODOLOGY

This study adopts a documentary research design, focusing on secondary data sources to investigate the role of artificial intelligence (AI) in analysing and monitoring the reputation and ranking of the University of Agriculture, Makurdi. The choice of documentary research is justified by the need to examine existing records, reports, and documented evidence on AI adoption, university performance metrics, research outputs, and stakeholder feedback. This approach allows for an in-depth understanding of how AI tools have influenced decision-making, performance monitoring, and reputation management at the university without direct field engagement (Bowen, 2020). The study specifically analyzes administrative reports, published ranking data, AI implementation records, and documented surveys of staff and stakeholders to generate comprehensive insights.

The focus of this study is the University of Agriculture, Makurdi, with attention to documented activities involving academic and administrative staff. The population includes lecturers, department heads, IT officers, and administrative managers whose contributions are reflected in university records, research output data, and performance monitoring reports. Although documentary research does not involve direct sampling of participants, key documents and records were purposively selected to represent all functional units involved in AI adoption and reputation management, ensuring comprehensive coverage of institutional processes and outcomes.

Data were collected from secondary sources, including:

i. University ranking reports (national and international).
ii. Administrative and performance monitoring records.
iii. Internal reports on AI adoption and usage for data analysis and sentiment monitoring.
iv. Documented stakeholder feedback and survey results relating to institutional reputation.

These sources provided quantitative measures of AI integration, institutional performance, and stakeholder perceptions, as well as qualitative insights into challenges and experiences documented by the university.

The documentary research design is appropriate because it leverages existing institutional records to evaluate AI adoption, university ranking, and reputation without direct participant involvement. This ensures a context-specific, efficient, and reliable assessment of AI's influence at the University of Agriculture, Makurdi.

Data Presentation

Effect of AI Adoption on University Ranking

Table 4.1: AI Adoption and University Performance Metrics (2019–2024)

Year	AI Tools Implemented	Research Publications	Research Citations	Administrative Efficiency (%)	University National Ranking
2019	Basic Data Management	120	250	68	12th
2020	Research Tracking Dashboard	135	310	72	10th
2021	Performance Monitoring System	150	385	75	9th
2022	Automated Analytics & AI Reporting	170	450	78	8th
2023	AI-Powered Decision Support	190	520	82	7th
2024	Integrated AI Analytics & Sentiment Monitoring	210	600	85	6th

Source: University of Agriculture, Makurdi Annual Reports (2019–2024)

Table 4.1 illustrates the trend in AI adoption and its corresponding impact on university performance metrics at the University of Agriculture, Makurdi, from 2019 to 2024. The data show a progressive implementation of AI tools, starting from basic data management in 2019 to integrated AI analytics and sentiment monitoring by 2024. As AI adoption increased, research publications rose from 120 in 2019 to 210 in 2024, while research citations grew from 250 to 600 over the same period. This indicates that AI tools, particularly research tracking dashboards and automated analytics, have facilitated greater research output and visibility.

Administrative efficiency similarly improved from 68% in 2019 to 85% in 2024, reflecting how AI-based performance monitoring and decision-support systems enhanced workflow, reduced delays, and optimized resource management. Correspondingly, the university's national ranking improved steadily from 12th in 2019 to 6th in 2024, suggesting a positive correlation between AI adoption and institutional performance. The analysis demonstrates that strategic deployment of AI tools not only supports academic and administrative processes but also contributes to enhanced competitiveness and institutional standing. This evidence

underscores the importance of AI as a key driver of university performance and ranking in North-Central Nigeria.

Effect of AI-Based Reputation and Sentiment Analysis on Stakeholder Perception

Table 4.2: Stakeholder Perception Scores Pre- and Post-AI Adoption

Year	Student Satisfaction (%)	Alumni Engagement (%)	Public/Media Sentiment Score (1–5)	Overall Reputation Index (1–100)
2019	65	58	3.2	60
2020	70	62	3.4	65
2021	73	68	3.6	68
2022	78	72	3.8	74
2023	82	78	4.1	79
2024	85	82	4.4	84

Source: University of Agriculture, Makurdi Stakeholder Feedback Reports (2019–2024)

The data presented in Table 4.2 demonstrates a consistent improvement in stakeholder perception of the University of Agriculture, Makurdi, from 2019 to 2024, coinciding with the adoption of artificial intelligence (AI) tools for reputation and sentiment analysis. Student satisfaction increased steadily from 65% in 2019 to 85% in 2024, indicating enhanced student experience and responsiveness to academic and administrative needs facilitated by AI-driven monitoring. Similarly, alumni engagement rose from 58% to 82%, reflecting improved communication, involvement in university activities, and positive perceptions of institutional credibility over time.

The public/media sentiment score, measured on a scale of 1 to 5, shows an upward trend from 3.2 in 2019 to 4.4 in 2024, suggesting that AI-enabled sentiment analysis allowed university management to identify and address stakeholder concerns more effectively, thereby improving external reputation. Consequently, the overall reputation index, which integrates multiple perception indicators, increased from 60 in 2019 to 84 in 2024, demonstrating a significant enhancement in institutional reputation.

Overall, the analysis indicates that AI adoption for reputation and sentiment analysis has positively influenced stakeholder perception, reinforcing the university's credibility, visibility, and public image. This trend underscores the strategic role of AI tools in fostering positive engagement with internal and external stakeholders.

DISCUSSION OF FINDINGS

Effect of AI Adoption on University Ranking

The findings from Table 4.1 indicate a progressive improvement in the University of Agriculture, Makurdi's research productivity, administrative efficiency, and national ranking from 2019 to 2024. The integration of AI tools for data analysis, performance monitoring, and decision support has enabled real-time tracking of research outputs, timely resource allocation, and identification of underperforming departments. This systematic monitoring and data-driven management have contributed to measurable enhancements in research citations, publication outputs, and operational efficiency, which are key indicators in national university ranking frameworks.

These results align with the study by Eze and Adeyemi (2023), who found that Nigerian universities leveraging data analytics and AI tools for performance monitoring demonstrated significant improvements in research visibility, teaching quality, and operational efficiency, all of which positively influenced their rankings. The empirical evidence supports the assertion that AI adoption facilitates strategic institutional planning, data-informed decision-making, and enhanced competitiveness in higher education.

The University of Agriculture, Makurdi's experience demonstrates that AI implementation is not only a technological upgrade but also a managerial strategy that directly affects performance metrics used in ranking systems. Despite the benefits, challenges such as infrastructure limitations and staff technical capacity were documented in university reports, reflecting similar constraints noted by Eze and Adeyemi (2023). Overall, the findings confirm that AI adoption is a critical determinant of improved ranking, highlighting the importance of sustained investment in technology and capacity-building to maintain competitive institutional performance.

Effect of AI-Based Reputation and Sentiment Analysis on Stakeholder Perception

The analysis of Table 4.2 shows a consistent increase in student satisfaction, alumni engagement, public/media sentiment scores, and overall reputation index at the University of Agriculture, Makurdi following the adoption of AI-driven sentiment analysis. The university's ability to monitor, evaluate, and respond to stakeholder feedback in real time appears to have strengthened stakeholder trust, improved engagement, and enhanced the overall perception of institutional credibility.

This finding corresponds with Musa and Garba (2023), who found that AI adoption for sentiment and reputation analysis in North-Central Nigerian universities positively influenced stakeholder perceptions, including students, alumni, and external partners. Their study emphasized that AI-enabled analytics allows institutions to proactively address concerns, enhance communication, and build a strong public image.

The University of Agriculture, Makurdi's documented improvements in perception scores suggest that AI tools are effective in translating quantitative stakeholder feedback into actionable strategies, thereby reinforcing reputation management. This demonstrates that technological adoption in higher education is not limited to administrative efficiency but also extends to enhancing intangible assets such as institutional credibility and stakeholder confidence. The findings indicate that sustained AI integration in monitoring reputation can foster trust, improve engagement, and contribute to long-term strategic positioning of the university in national and international contexts.

CONCLUSION

This study examined the role of artificial intelligence (AI) in analysing and monitoring the reputation and ranking of the University of Agriculture, Makurdi. Using a documentary research design, secondary data from administrative reports, university ranking records, and stakeholder feedback were analyzed to assess the effects of AI adoption on institutional performance and perception. The findings indicate that the systematic integration of AI tools for data analysis, performance monitoring, and sentiment analysis has led to measurable improvements in research productivity, administrative efficiency, and national ranking. AI-enabled decision support systems allowed timely identification of strengths and weaknesses, optimized resource allocation, and enhanced overall institutional management.

In addition, the study revealed that AI-driven reputation and sentiment analysis positively influenced stakeholder perceptions. Student satisfaction, alumni engagement, public/media sentiment, and overall reputation scores improved significantly over the five-year period, demonstrating that AI tools facilitate proactive monitoring and management of institutional credibility. These outcomes corroborate previous empirical studies indicating that AI adoption strengthens both tangible performance metrics and intangible reputational assets.

The study concludes that AI adoption is a critical strategic intervention for universities seeking to enhance competitiveness, visibility, and stakeholder confidence. By integrating AI technologies into both operational and reputational management processes, higher education institutions can achieve sustained improvements in ranking and credibility. Consequently, policymakers, university administrators, and stakeholders should prioritize investments in AI infrastructure, capacity-building initiatives, and data-driven management practices to leverage the full potential of AI in shaping institutional performance and reputation.

RECOMMENDATIONS

The study proffers the following two recommendations based on the findings:

The University of Agriculture, Makurdi, should prioritize continuous investment in AI tools, data analytics platforms, and performance monitoring systems. Alongside infrastructure, the university should implement targeted training programs for academic and administrative staff to enhance AI literacy and technical competence. This will ensure that AI tools are effectively utilized for data-driven decision-making, research tracking, and performance monitoring, thereby sustaining improvements in university ranking and operational efficiency.

The university should adopt comprehensive AI-based reputation and sentiment analysis systems to systematically monitor stakeholder feedback, including students, alumni, and the public. By proactively analyzing feedback and addressing concerns, the university can strengthen stakeholder engagement, improve satisfaction, and enhance institutional credibility. Such systems should be integrated into strategic planning and communication processes to maintain a positive reputation and ensure that stakeholder perceptions contribute to long-term institutional growth and competitiveness.

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