Assessment of Artificial Intelligence Tools Adoption and Workforce Optimisation in the Fintech Industry

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Abstract

The adoption of artificial intelligence (AI) tools and workforce optimization pose unique challenges in both developed and developing nations. This study investigates the adoption of artificial intelligence (AI) tools and their impact on workforce optimization in Nigeria's fintech sector, where only about 20% of financial institutions currently utilize AI. Challenges such as regulatory constraints, inadequate infrastructure, and skills shortages hinder progress. An explanatory research design was employed, focusing on supervisors and managers from the top five fintech companies: Flutterwave, Interswitch, Paystack, Carbon, and Paga. A structured questionnaire was distributed via Google Forms, yielding 191 valid responses, representing an 80% return rate. Data analysis was conducted using SPSS. The results reveal a significant relationship between AI tool adoption and workforce optimization (Sβ = 0.768; R^2 = 0.590; F = 15.895; Tval = 10.836; Pval = 0.000). The Sβ value indicates a strong correlation, with AI accounting for 59% of the variance in workforce optimization. These findings highlight the essential role of AI in enhancing operational efficiency and productivity, suggesting that Nigerian fintech firms should prioritize AI adoption to foster innovation and maintain competitiveness in an evolving financial landscape.

Keywords: *Artificial Intelligence, Optimisation, Roles, Technology, Tools, Workforce*

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1. Introduction

The intersection of artificial intelligence (AI) and financial technology (Fintech) has become a focal point in the modern financial landscape (Guo &Polak, 2021; Kumar, & Sergeeva, 2022), with AI tools increasingly being adopted to optimize operations and enhance customer experiences (Kshetri, 2021; Mogaji & Nguyen, 2022). AI, with its capacity to mimic human intelligence and learn from data, offers a range of possibilities for Fintech companies seeking to innovate and stay competitive in a rapidly evolving market. This adoption of AI tools represents a paradigm shift in the way financial services are delivered and consumed, ushering in a new era of efficiency, personalization, and data-driven decision-making.

Sampene, Agyeman, Robert and Wiredu (2022) defined Artificial intelligence (AI) defined as the simulation of human intelligence by machines to perform tasks such as learning, reasoning, and decision-making. This implies that AI has become a cornerstone of innovation in the financial technology (fintech) industry to enhance and automate financial services, including payments, lending, and investments. Roy and Viswanathan (2019) affirmed that workforce optimization is a critical aspect of organizational efficiency that involves leveraging tools and strategies to maximize employee productivity while aligning with business objectives. The fintech industry refers to the application of technology to improve and automate financial services, encompassing a wide range of sectors such as banking, payments, investment management, and insurance (Zhang, Ashta & Barton, 2021).

In Nigeria, the adoption of AI tools in fintech holds immense potential for improving financial inclusion (Awodu, 2023), fraud detection, and operational efficiency (Mogaji & Nguyen, 2022). However, Ladagu (2020) and Kshetri (2021) argued that challenges such as inadequate digital infrastructure, regulatory uncertainties, and a shortage of skilled professionals hinder its full implementation. These barriers underscore the need for this study to assess how AI adoption can optimize the workforce and address these challenges.

In Nigeria's Fintech landscape, several prevailing issues emerge in relation to the adoption of artificial intelligence tools and workforce optimization. One significant challenge lies in the regulatory environment, where ambiguity and inconsistency hinder the seamless integration of AI technologies into financial services. For instance, Awodu's (2023) case study on Fintech startups in Nigeria highlights how regulatory barriers can stifle innovation and inhibit the adoption of AI solutions.

Additionally, the skills gap within the Nigerian workforce presents a notable obstacle, with a shortage of professionals proficient in AI development and implementation. This issue is exemplified by Ladagu's (2020) survey, which underscores the need for workforce optimization strategies to bridge

the skills divide and maximize the benefits of AI adoption in the Nigerian Fintech sector. In addressing these prevailing issues, the objective is to foster a conducive regulatory environment, promote skill development initiatives, and facilitate collaboration between industry stakeholders to drive sustainable growth and innovation in Nigeria's Fintech industry.

2. Literature Review

2.1 Conceptual Clarification

2.1.1 Artificial Intelligence [AI]

Artificial Intelligence (AI) refers to the development of computer systems that can perform tasks typically requiring human intelligence, such as learning, problem-solving, and decision-making (Guo&Polak, 2021; Kumar &Sergeeva, 2022). In the context of the Fintech industry in Nigeria, AI technologies are increasingly being adopted to automate processes, enhance customer experiences, and drive innovation. According to Kunwar (2019), the global AI in finance market is projected to reach $26.67 billion by 2026, indicating a growing reliance on AI-driven solutions within the financial sector. In Nigeria, the adoption of AI in Fintech is gaining momentum, with a report by Ladagu (2020) revealing that 65% of Nigerian Fintech companies are exploring AI applications to improve their operations. This underscores the significance of AI in shaping the future of the Fintech industry in Nigeria and its potential to drive sustainable growth and innovation.

2.1.2 Artificial Intelligence Tools Adoption

According to Qadiri, Shabir and Qadri (2020), artificial intelligence tools adoption in the Fintech industry encompasses various dimensions, including chatbots and virtual assistants (CVAs), fraud detection systems (FDSs), credit scoring models (CSMs), and automated investment platforms (AIPs). Mogaji and Nguyen (2022) established that these tools play a crucial role in enhancing operational efficiency, improving customer experiences, and driving business growth within the Nigerian Fintech landscape. For example, *chatbots and virtual assistants* enable Nigerian Fintech companies to automate customer interactions and provide personalized services, contributing to increased customer satisfaction and loyalty (Ashta & Herrmann, 2021). Similarly, *fraud detection systems* help mitigate financial risks and safeguard transactions in the Fintech sector, with Nigerian startups like Flutterwave implementing AI-powered fraud detection solutions to protect against fraudulent activities (Awodu, 2023). Additionally, *credit scoring models* and *automated investment platforms* empower Nigerian Fintech firms to assess creditworthiness, optimize investment strategies, and promote financial inclusion (Kshetri, 2021; Mamela, 2021). These examples highlight the significance of AI tools adoption in driving innovation and competitiveness within the Nigerian Fintech industry.

2.1.3 Workforce Optimization

Pillai and Brijesh (2020) posited that workforce optimization in the Fintech industry in Nigeria involves maximizing the efficiency, productivity, and performance of employees through the strategic deployment of AI technologies and human capital management strategies (Thowfeek, *et al*. 2020). According to a study by Johnson et al. (2021), workforce optimization is critical for achieving business success in the digital economy, with AI-driven automation playing a key role in streamlining operations and empowering employees to focus on value-added tasks. In Nigeria, workforce optimization is particularly relevant due to the country's youthful population and burgeoning Fintech ecosystem. However, challenges such as skills shortages and regulatory constraints pose obstacles to workforce optimization in the Nigerian Fintech industry (Ladagu, 2020). Therefore, addressing these challenges and leveraging AI tools adoption are essential for maximizing the potential of the workforce and driving sustainable growth in the Nigerian Fintech sector.

2.1.4 Fintech Industry in Nigeria

The Fintech industry in Nigeria is experiencing rapid growth and innovation, driven by advancements in technology and changing consumer preferences (Awodu, 2023; Ladagu, 2020). According to a report by Ladagu (2020), Nigeria is home to over 200 active Fintech startups, with investments in the sector surpassing $200 million in 2020. This burgeoning Fintech ecosystem presents significant opportunities for leveraging AI tools adoption and optimizing the workforce to drive operational efficiency and enhance customer experiences. However, as highlighted by Awodu (2023), Nigerian Fintech firms face challenges such as regulatory ambiguity, infrastructure limitations, and skills shortages, which hinder the full realization of their potential. Therefore, assessing the role of AI tools adoption and workforce optimization is crucial for addressing these challenges and unlocking the transformative power of the Fintech industry in Nigeria.

2.2 Theoretical Review

Resource-Based View (RBV)

The Resource-Based View (RBV), originally proposed by Edith Penrose in 1959 and later refined by Barney in 1991, posits that a firm’s competitive advantage arises from its unique resources and capabilities that are valuable, rare, inimitable, and non-substitutable (VRIN). This theory emphasizes that internal resources, such as technology, human capital, and organizational processes, are critical for achieving and sustaining a competitive edge. In the context of the fintech industry, RBV is particularly relevant as firms increasingly adopt artificial intelligence (AI) tools to optimize their workforce and enhance operational efficiency. For instance, Nigerian fintech companies like Flutterwave leverage AI-driven fraud detection systems to improve security and build user trust, which are valuable and rare capabilities that differentiate them from competitors (Awodu, 2023). By aligning AI adoption with

workforce optimization, fintech firms can create inimitable processes that enhance productivity, customer satisfaction and competitive advantages.

The relevance of RBV to this study lies in its ability to explain how fintech firms in Nigeria can strategically utilize AI tools as a resource to overcome challenges such as fraud, inefficiency, and customer distrust. In a competitive and rapidly evolving market, the ability to deploy AI for workforce optimization not only improves internal processes but also addresses external pressures like regulatory compliance and market demands. For example, the integration of AI in workforce management allows firms to streamline operations, reduce costs, and improve decision-making, which are critical for thriving in Nigeria's fintech ecosystem. This study, therefore, builds on RBV to assess how AI adoption can serve as a strategic resource for workforce optimization, enabling Nigerian fintech firms to achieve long-term success despite infrastructural and regulatory challenges.

Technology-Organization-Environment (TOE) Framework

The Technology-Organization-Environment (TOE) framework, developed by Tornatzky and Fleischer in 1990, provides a comprehensive model for understanding the factors influencing technology adoption. This framework identifies three key dimensions: technological factors (e.g., perceived benefits and complexity), organizational factors (e.g., size, culture, and leadership), and environmental factors (e.g., regulatory policies and market competition). In the context of Nigeria's fintech industry, the TOE framework is particularly relevant for analyzing the adoption of AI tools. For example, external environmental factors such as regulatory challenges and inadequate digital infrastructure significantly hinder AI adoption in Nigeria (Awodu, 2023). At the same time, internal organizational factors, such as leadership support and a culture of innovation, play a critical role in determining how effectively fintech firms integrate AI into their operations (Ladagu, 2020).

The TOE framework's relevance to this study lies in its ability to provide a structured approach to examining the barriers and enablers of AI adoption in Nigeria's fintech sector. By analyzing technological, organizational, and environmental dimensions, this study can identify specific factors that influence workforce optimization through AI. For instance, while technological advancements like machine learning algorithms offer immense potential for improving workforce efficiency, their adoption is often constrained by external factors such as inconsistent regulatory frameworks and limited internet penetration in Nigeria. Similarly, organizational readiness, including leadership commitment and employee training, determines the success of AI implementation. This study leverages the TOE framework to explore how Nigerian fintech firms can navigate these challenges and create an enabling environment for AI-driven workforce optimization.

2.3 Empirical Review

Johnson et al. (2021) examined the impact of big data and artificial intelligence (AI) on various industries, particularly the Fintech sector, across multiple locations in the United States. The study aimed to develop a workforce roadmap for a data-driven economy, highlighting the skills and competencies necessary for effectively utilizing big data and AI. Involving 465 respondents from diverse sectors, the findings indicated that big data and AI facilitate data-driven decision-making, predictive analytics, and process automation. In Fintech, AI applications such as chatbots and fraud detection systems improve operational efficiency and customer experience. However, successful adoption necessitates investments in workforce development and training to equip employees with the required skills. The study underscores the need for further research to identify specific strategies for workforce development and talent acquisition in the Fintech sector.

A study by Guo and Polak (2021) examined the role of artificial intelligence (AI) in the FinTech industry during the COVID-19 pandemic in Ostrava and Brno, Czech Republic. It found that AI solutions, such as chatbots and fraud detection systems, were essential for facilitating remote work, enhancing customer support, and combating fraud. The findings highlight the importance of AI for resilience in FinTech. However, further research is needed to understand the long-term effects of AI adoption on business models, customer behaviors, and regulations in the post-pandemic period.

Pillai and Brijesh (2020) conducted a survey involving 562 HR and talent acquisition managers in India to assess the adoption of artificial intelligence (AI) in talent acquisition for IT and ITeS organizations. The study highlights that AI technologies like natural language processing, machine learning, and predictive analytics are increasingly utilized to automate candidate sourcing, screening, and selection, enhancing efficiency, reducing bias, and improving hiring quality. However, challenges such as algorithmic bias, data privacy, and skills gaps persist. The research calls for further studies on the impact of AI on employee retention, job satisfaction, and organizational performance, as well as comparative analysis across industries and regions to understand AI adoption factors in talent management.

Mogaji and Nguyen (2022) assessed managers' understanding of AI in marketing financial services through a survey of 298 managers across various countries. While some leverage AI for personalized marketing, others raise concerns about data privacy and ethical issues. The findings emphasize the need for ongoing education to improve managers' comprehension of AI's applications in marketing. The authors suggest further research to evaluate the effects of AI adoption on marketing effectiveness and business performance in the Fintech industry.

Kshetri (2021) explored the role of artificial intelligence (AI) in enhancing financial inclusion in developing countries, particularly within the Fintech sector. His literature review (2010-2020) and analysis of case studies revealed that AI-driven solutions, such as mobile banking apps and robo-

advisors, significantly improve access to financial services for underserved populations. However, challenges like digital literacy, regulatory barriers, and data privacy concerns hinder equitable service distribution. The study calls for further research on the scalability and sustainability of AI initiatives within regulatory and infrastructural contexts.

Awotunde et al. (2021) explored the application of big data in the Nigerian financial services sector, with a particular focus on its integration with Fintech. The research aimed to assess how big data analytics can enhance Fintech operations and foster innovation. The findings indicated that integrating big data analytics with Fintech can lead to improved risk management, personalized customer experiences, and enhanced decision-making processes. However, the study also highlighted challenges such as data privacy concerns and regulatory constraints that must be addressed to fully realize the potential of big data in the Fintech landscape. While the insights provided are valuable, there is a need for further research to investigate specific use cases and implementation strategies for Fintech startups.

2.4 Research Gaps

Previous studies on artificial intelligence (AI) adoption and workforce optimization have primarily relied on secondary data, industry reports, and qualitative methods, often with smaller sample sizes and limited time frames. These studies have predominantly focused on industries such as telecommunications, healthcare, manufacturing, and insurance, leaving the fintech industry underexplored. Furthermore, many of these studies lacked robust theoretical frameworks and did not employ longitudinal or quantitative approaches, which are essential for understanding the long-term impacts of AI on workforce dynamics and sustainable performance. This current study addresses these gaps by focusing specifically on the fintech industry in Nigeria, a rapidly growing sector with unique challenges and opportunities. By leveraging a more comprehensive methodological approach, this study aims to provide deeper insights into how AI tools can optimize workforce performance in the Nigerian fintech context.

3. Methodology

This study investigates the role of artificial intelligence tools and workforce optimization in the Fintech industry using an explanatory research design. This approach aims to uncover the relationships between AI adoption, workforce optimization strategies, and performance indicators within Fintech companies. The study focuses on supervisors and managers from the top five Fintech companies in Nigeria, namely Flutterwave, Interswitch, Paystack, Carbon, and Paga, selected based on their market impact and IT adoption (Ladagu, 2020).Awodu (2023) added that these companies exemplify the innovative and transformative potential of Nigeria's fintech industry.

The selection of Flutterwave, Interswitch, Paystack, Carbon, and Paga as the top five fintech companies in Nigeria is supported by their significant market impact and adoption of innovative IT solutions. Flutterwave, for instance, has been recognized for its relevance in both African and global fintech markets, particularly through its consumer payment services and corporate solutions. Interswitch, a pioneer in Nigeria's fintech space since 2002, has played a foundational role in shaping the industry and remains a leader in payment processing and digital transactions.

Paystack, acquired by Stripe in 2020, is celebrated for its seamless payment solutions and its role in driving e-commerce growth in Nigeria. Carbon, formerly known as Paylater, is a leading digital lending platform that has expanded into payments and investment services, showcasing its versatility in the fintech ecosystem. Lastly, Paga has revolutionized mobile payments and financial inclusion in Nigeria, with millions of users relying on its platform for secure and convenient transactions.

The population consists of 760 registered Mobile Money Payments operators regulated by government authorities, with all selected firms being operational for at least fifteen years. Only registered Savings and Investments operators and Mobile Money Payments entities under the oversight of the SEC and CBN are included, as detailed in Table 1.

Table 1: List of Selected FinTech firms in Nigeria

SN	FinTech Firms	Head Office Location	Total number of employees/ staff in the Head Office	Sample size (i.e. Supervisors & Managers)
Mobile Money Payments Operators				
1	Pay Stack (PS)	Yaba, Lagos	128	61
2	Flutter Wave (FW)	Lekki, Lagos	141	50
3	Interswitch (IS)	Victoria Island, Lagos	116	47
4	Carbon [formerly Paylater]	Victoria Island, Lagos	97	39
5	Paga (PG)	Yaba, Lagos	101	43
Total			**583**	**240**

Source: Ladagu (2020) and Awodu (2023)

The study focused on a staff population of 583, from which a sample size of 240 supervisors and managers was determined using the Taro Yamane formula ($n = N/\{1 + N(e^2)\}$). With a margin of error set at 0.05, the sample was adjusted to facilitate data collection while ensuring statistical significance.

$$n = \frac{N}{\{1 + N(e^2)\}} \qquad n = \frac{583}{(1+583[0.05]^2)}$$

n = **237**

Approximated to 240

A structured questionnaire was deployed via Google Forms, chosen for its convenience and accessibility. It included both closed- and open-ended questions to gather responses from the cross section of participants on the effect of AI adoption on workforce optimization and was reviewed for content validity by experts.

Data analysis incorporated descriptive statistics (means, frequencies, percentages) for demographic insights and inferential statistics (regression analysis) to explore relationships between AI adoption, optimization strategies, and performance outcomes in the Fintech sector. In addition, ethical considerations included obtaining informed consent, ensuring confidentiality, and adhering to institutional and professional ethical guidelines throughout the research process.

4. Presentation of Data

In this study, the focal group under examination consisted of supervisors and managers within selected Fintech Industry in Nigeria. Specifically, these companies (Flutterwave, Interswitch, Paystack, Carbon [formerly Paylater], Paga) were purposively selected based on several key criteria, including customer base, market share, growth trajectory, profit margin, capital base, and level of IT adoption. The distribution of questionnaires was carried out via both hard copies and online platforms, targeting individuals aged 18 years and above. Subsequently, after diligent follow-ups, 191 completed copies of questionnaire were deemed suitable for analysis. This response rate of 80% is deemed significant and formed a solid basis for drawing empirical conclusions.

4.1 Demographic Characteristics of the Respondents

Table 1 presents the demographic profile of participants, specifically employees within chosen Fintech Industry in Nigeria. Descriptive statistics concerning the classification of responses by demographic characteristics such as gender, age, education, and tenure are provided in Table 1.

Table 1: Demographic Characteristics of the Respondents (i.e. supervisors and managers) in the Fintech Industry [n=191]

Variables	Response(s)	Percentage (%)
Gender		
Male	88	46
Female	103	54
Age		
Below 25 years	58	30
25-40 years	105	55
41years and above	28	15
SSCE	10	5
Bachelor's Degree	129	68
Post Graduate Degree	52	27
Tenure		
1-5years	47	25
6-10years	111	58
11years & above	33	17

Table 1 presents the demographic characteristics of 191 supervisors and managers within the fintech industry. The gender distribution is relatively balanced, with 54% of respondents identifying as female and 46% as male. The age composition shows that 55% of the respondents fall within the 25-40 age range, suggesting a prevalence of mid-career professionals. A notable 68% of the workforce holds bachelor's degrees, indicating a high level of education among participants. Furthermore, 58% have occupied their current roles for 6-10 years, which points to a stable and experienced management team. These findings highlight the diversity, professional qualifications, and experience present in the management of fintech industry.

4.2 Analysis of Research Variables

This segment presents the outcomes of frequency distribution and interpretations from participants regarding the adoption of artificial intelligence tools and workforce optimization in the Fintech industry. The independent variable, artificial intelligence tools adoption, includes Chatbots and Virtual Assistants (CVAs), Fraud Detection Systems (FDSs), Credit Scoring Models (CSMs), and Automated Investment Platforms (AIPs). The dependent variable is workforce optimization in Nigeria's Fintech sector.

4.2.1 Chatbots/Virtual Assistants [CVAs] and Workforce Optimization (N= 191)

To address Research Objective 1, Tables 2 and 3 showed the impact of chatbots and virtual assistants [CVAs] on the workforce optimization of the Fintech industry in Nigeria. The **independent variable** is chatbots and virtual assistants [CVAs] and the **dependent variable** is the workforce optimization**.** Therefore**,** Table 5 examines the effectiveness of chatbots and virtual assistants [CVAs] while Table 6 outlines the statements/items for workforce optimization within the selected Fintech Industry.

Table 2: Chatbots/Virtual Assistants [CVAs]

SN	**Chatbots/Virtual Assistants**	**Mean**	**SD**	**Decision**
1	I found using AI-powered virtual assistants convenient for resolving customer inquiries	4.200	.827	Agree
2	Chatbots and Virtual Assistants simplified my work tasks by providing quick assistance.	3.906	.902	Agree
3	Interacting with AI-powered virtual assistants improved my productivity in handling customer requests	3.661	.833	Agree
4	I felt comfortable relying on AI-powered virtual assistants to assist customers with routine queries.	3.658	.849	Agree
	Average Mean	**3.856**	**.853**	**Agree**

Table 2 reveals that fintech employees generally have a positive perception of AI-powered chatbots and virtual assistants, as indicated by an average mean score of 3.856 (SD = 0.853). Among the statements, the highest mean score of 4.200 (SD = 0.827) reflects the strongest consensus, where respondents agreed that using AI-powered virtual assistants is convenient for resolving customer inquiries. This suggests that employees find chatbots particularly effective in handling customer-related tasks. Other areas, such as simplifying work tasks (mean = 3.906) and improving productivity (mean = 3.661), also received agreement but with slightly lower mean scores. These findings highlight the potential of chatbots to optimize workforce efficiency and optimisation

Table 3: Workforce Optimisation [WOPT]

SN	**Workforce Optimisation**	**Mean**	**SD**	**Decision**
1	I felt that my skills were effectively utilized within the organization.	4.111	.731	Agree
2	The workload distribution was fair and balanced among team members.	3.865	.654	Agree

3	I received adequate support and resources to perform my tasks efficiently.	3.154	.810	Undecided
4	The organization promoted collaboration and teamwork to achieve common goals.	3.692	.826	Agree
5	I believe that processes and workflows were streamlined to enhance efficiency in our work.	4.186	.744	Agree
6	The organization effectively aligned tasks and responsibilities with employees' strengths/abilities.	4.095	.888	Agree
	Average Mean	**3.850**	**.775**	**Agree**

Table 3 highlights employees' perceptions of workforce optimization within the fintech industry, with an overall average mean score of 3.850 (SD = 0.775), indicating a generally positive sentiment. Among the statements, the highest mean score of 4.186 (SD = 0.744) reflects the strongest consensus, where respondents agreed that processes and workflows were streamlined to enhance efficiency in their work. This suggests that employees perceive streamlined processes as a key factor contributing to workforce optimization.

Other notable findings include high mean scores for statements such as effective utilization of skills (mean = 4.111, SD = 0.731) and alignment of tasks with employees' strengths and abilities (mean = 4.095, SD = 0.888), further reinforcing the positive perception of workforce management practices. However, the statement regarding adequate support and resources to perform tasks efficiently received a lower mean score of 3.154 (SD = 0.810), with respondents remaining undecided. This indicates a potential area for improvement and suggested that fintech companies should focus on providing better resources and support to employees. Specifically, the findings underscore the importance of maintaining streamlined processes and aligning tasks with employee strengths to optimize workforce performance in the fintech sector.

4.2.2 Analysis of Fraud Detection Systems [FDSs] (n= 191)

Research objective 2 ascertains the impact of Fraud Detection Systems [FDSs] on the workforce optimization of the Fintech industry in Nigeria [Table 4]. The **independent variable** is Fraud Detection Systems [FDSs] and the **dependent variable** is the workforce optimization**.**

Table 4 Fraud Detection Systems [FDSs]

SN	Fraud Detection Systems[FDSs]	Mean	SD	Decision
1	I felt confident in the accuracy of Fraud Detection Systems in identifying potential fraudulent activities	3.846	.810	Agree
2	Behaviour Analytics Software effectively alerted me to suspicious transactions in a timely manner	4.006	.911	Agree
3	I appreciated the role of Biometric Authentication in enhancing security measures within our fintech operations	4.147	.827	Agree
4	I found Transaction Monitoring Platforms reliable in preventing fraudulent activities and protecting our customers' assets	3.905	.836	Agree
	Average Mean	**3.976**	**.846**	**Agree**

Table 4 provides insights into employees' perceptions of Fraud Detection Systems (FDSs) within the fintech industry, with an overall positive sentiment reflected by an average mean score of 3.976 (SD = 0.846). Among the statements, the highest mean score of 4.147 (SD = 0.827) reflects the strongest consensus, where respondents agreed that Biometric Authentication plays a crucial role in enhancing security measures within fintech operations. This indicates that employees consider biometric authentication systems to be the most reliable and valuable component of fraud detection efforts.

Other notable findings include high mean scores for Behaviour Analytics Software effectively alerting employees to suspicious transactions (mean = 4.006, SD = 0.911) and Transaction Monitoring Platforms being reliable in preventing fraudulent activities (mean = 3.905, SD = 0.836). These responses highlight the overall confidence of employees in the efficacy of fraud detection technologies. However, the highest preference for biometric authentication suggests that fintech companies should continue to invest in and improve such systems as a priority and ensure they remain a robust cornerstone of their security infrastructure. This focus on biometric authentication, combined with other FDS tools, will help maintain trust, secure customer assets, and uphold the integrity of fintech operations.

4.2.3Analysis of Credit Scoring Models [CSMs] (n= 191)

Research objective 3 determines the influence of credit scoring models [CSMs] on the workforce optimization of the Fintech industry in Nigeria. The **independent variable** is **Credit Scoring Models [CSMs]** and the **dependent variable** is the workforce optimization [see Table 5].

Table 5 Credit Scoring Models [CSMs]

SN	Credit Scoring Models [CSMs]	Mean	SD	Decision
1	I found the credit scoring model such as PICO Score accurate in predicting customer creditworthiness	3.702	.766	Agree
2	The credit scoring model streamlined our lending process and improved efficiency.	4.195	.789	Agree
3	Using the credit scoring model helped me make informed decisions when assessing loan applications.	3.903	.814	Agree
4	I trusted the credit scoring model, such as TransUnion CreditVision Score, to assess risk accurately and minimize defaults.	3.888	.855	Agree
	Average Mean	**3.922**	**.806**	**Agree**

Table 5 provides insights into employees' perceptions of Credit Scoring Models (CSMs) within the fintech industry, with an overall average mean score of 3.922 (SD = 0.806), indicating a generally positive sentiment. Among the statements, the highest mean score of 4.195 (SD = 0.789) reflects the strongest consensus, where respondents agreed that credit scoring models streamline the lending process and improve efficiency. This suggests that employees view the efficiency-enhancing capabilities of CSMs as their most valuable contribution to workforce optimization.

Other notable findings include high mean scores for statements such as the ability of CSMs to help employees make informed decisions when assessing loan applications (mean = 3.903, SD = 0.814) and their reliability in assessing risk and minimizing defaults (mean = 3.888, SD = 0.855). Additionally, the accuracy of models like FICO Score in predicting customer creditworthiness received a mean score of 3.702 (SD = 0.766). These results highlight the overall confidence in CSMs' effectiveness in credit risk management. However, the highest preference for their role in streamlining processes underscores the importance of maintaining and improving these systems to enhance operational efficiency and decision-making in the fintech sector.

4.2.4 Automated Investment Platforms [AIPs] (n= 191)

Research objective 4 analyses the role of automated investment platforms [AIPs] on the workforce optimization of the Fintech industry in Nigeria. The **independent variable** is automated investment platforms [AIPs] and the **dependent variable** is the workforce optimization [see Table 6].

Table 6: Automated Investment Platforms [AIPs]

SN	Automated Investment Platforms [AIPs]	Mean	SD	Decision
1	I felt confident in the performance of the automated investment platform, such as Betterment and Wealthfront, in managing my portfolio	3.690	.815	Agree
2	The automated investment platform simplified the investment process and saved me time.	4.019	.903	Agree
3	Using the automated investment platform helped me diversify my portfolio effectively.	4.104	.796	Agree
4	I found the automated investment platform user-friendly and easy to navigate for managing investments.	3.582	.851	Agree
	Average Mean	**3.849**	**.841**	**Agree**

Table 6 provides insights into employees' perceptions of Automated Investment Platforms (AIPs) within the fintech industry, with an overall average mean score of 3.849 (SD = 0.841), indicating a generally positive sentiment. Among the statements, the highest mean score of 4.104 (SD = 0.796) reflects the strongest consensus, where respondents agreed that AIPs, such as Betterment and Wealthfront, helped them diversify their portfolios effectively. This suggests that employees view portfolio diversification as the most significant benefit of AIPs. The findings also highlighted the ability of the Fintech firms to optimize investment strategies and reduce risk through automated and algorithm-driven processes.

Another notable finding includes high mean scores for simplifying the investment process and saving time (mean = 4.019, SD = 0.903) and confidence in the performance of AIPs in managing portfolios (mean = 3.690, SD = 0.815). However, the user-friendliness of AIPs received a slightly lower mean score of 3.582 (SD = 0.851), indicating room for improvement in enhancing platform navigation and usability. The strong preference for portfolio diversification underscores the importance of AIPs in democratizing access to sophisticated investment strategies, enabling users to achieve financial goals efficiently. Fintech companies should continue to innovate and refine these platforms by focusing on user experience and education to maximize their potential and appeal.

4.3. Test of Hypothesis

H_o: *Artificial intelligence tools adoption does not significantly affect workforce optimisation in the fintech industry.*

H_1: *Artificial intelligence tools adoption significantly influence workforce optimisation in the fintech industry.*

This research work used multivariate regression analysis to test the hypothesis. The data for artificial intelligence tools adoption and workforce optimisation were generated by adding scores of responses of all items for each of the variable. The results of the regression are presented in Table 7.

Table 7: Regression for AI tools adoption and workforce Optimisation

Model Summary					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	
1	.768[a]	.590	.583	.678532	
ANOVA					
Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	30.836	4	7.709	15.895	.000
Residual	90.193	186	.485		
Total	121.029	190			
Co-efficient					
Variables	Unstandardised Coefficients		Standardised Coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	1.894	.098		10.836	.000
Chatbots and Virtual Assistants	0.569	.068	.442	9.736	.000
Fraud Detection Systems	0.623	.071	.498	10.265	.000
Credit Scoring Models	0.600	.090	.486	9.937	.000
Automated Investment Platforms	0.513	.073	.410	8.935	.000
Dependent Variable: *Workforce optimisation*					

(Source: Field 2024)

The regression analysis presented in Table 7 provides significant insights into the relationship between the adoption of artificial intelligence (AI) tools and workforce optimization within the fintech industry. The model summary indicates a strong positive correlation ($R = .768$) between the adoption of AI tools and workforce optimization, with AI tools explaining approximately 59% of the variance in workforce optimization. Additionally, the ANOVA results show that the regression model is statistically significant ($F = 15.895$, $p < .001$). This suggests that the predictors (Chatbots and Virtual Assistants, Fraud Detection Systems, Credit Scoring Models, and Automated Investment Platforms) collectively contribute to explaining the variance in workforce optimization. The linear regression model established is:

$$WOPT = 1.894 + .569CVA + .623FDS + .600CSM + .513AIP \quad \text{..... (eq.i)}$$

Where:

WOPT = Workforce optimisation

CVA = Chatbots and Virtual Assistants

FDS = Fraud Detection Systems

CSM = Credit Scoring Models

AIP = Automated Investment Platforms

Further analysis of the coefficients reveals the individual contributions of each AI tool to workforce optimization. Chatbots and Virtual Assistants (Sβ=0.442; Uβ =0.569; T_{val}= 9.736; P_{val}= 0.000), Fraud Detection Systems (Sβ =0.498; Uβ =0.623; T_{val}= 10.265; P_{val}= 0.000), Credit Scoring Models (Sβ =0.486; Uβ =0.600; T_{val}= 9.937; P_{val}= 0.000), and Automated Investment Platforms (Sβ =0.410; Uβ =0.513; T_{val}= 8.935; P_{val}=0.000) all show positive standardized coefficients, indicating that higher adoption levels of these AI tools are associated with increased levels of workforce optimization. These findings suggest that the integration of AI tools, such as chatbots for customer service, fraud detection systems for security, credit scoring models for risk assessment, and automated investment platforms for portfolio management, can significantly enhance workforce optimization within the fintech industry.

5. Discussion

The findings on the adoption of AI tools in the fintech industry support earlier research by Almansour (2023) and Awotunde et al. (2021), and they highlighted the role of AI in workforce optimization and big data application in financial services.

The study revealed a positive relationship between Chatbots and Virtual Assistants (CVAs) and workforce optimization. The findings predicted that a unit increase in their adoption will enhance workforce optimization by 0.569. This finding emphasizes the significant role CVAs play in improving operational efficiency and workforce productivity. Ashta and Herrmann (2021) highlight the potential of Artificial Intelligence (AI) to streamline processes within financial institutions, supporting the study's results. Furthermore, this finding aligns with Johnson et al. (2021), who noted AI's role in creating a data-driven workforce roadmap, demonstrating how CVAs can revolutionize employee workflows by automating routine tasks and enabling employees to focus on more strategic responsibilities. These insights underscore the value of integrating CVAs into fintech operations to achieve enhanced workforce optimization.

The study also identified a positive relationship between Fraud Detection Systems (FDSs) and workforce optimization. The analysis predicted that a unit increase in FDS adoption could enhance workforce optimization by 0.623. This finding supports Guo and Polak (2021), who emphasized the critical role of AI in driving operational efficiency. Moreover, it aligns with the works of Kshetri (2021)

and Mamela (2021), which highlight the impact of AI tools in improving financial inclusion and workforce performance. Fraud detection systems not only enhance security but also reduce the manual workload for employees by automating the identification and mitigation of potential risks. This decreases operational bottlenecks and allows employees to redirect their efforts toward other value-added tasks and significantly contribute to workforce productivity in the fintech industry.

The findings also established a positive relationship between credit scoring models (CSMs) and workforce optimization. The analysis predicted that a unit increase in CSM adoption will boost workforce optimization by 0.600. Credit scoring models, such as FICO and TransUnion CreditVision, play a transformative role in financial operations by providing accurate risk assessments and streamlining lending processes. This result reflects the insights of Ashta and Herrmann (2021), who emphasized the operational potential of credit scoring in financial institutions. Additionally, the findings align with Mogaji and Nguyen (2022), who discussed AI's role in enhancing marketing strategies and operational planning. By simplifying loan assessments and reducing human error, CSMs not only improve decision-making but also enable employees to handle larger volumes of applications efficiently.

The study further revealed that automated investment platforms (AIPs) have a positive influence on workforce optimization. Specifically, a unit increase in AIP adoption is predicted to enhance workforce optimization by 0.513. This finding underscores the importance of AIPs, such as Betterment and Wealthfront, in driving operational efficiency and empowering employees to perform better. It resonates with the work of Kshetri (2021) and Pillai and Sivathanu (2020), who highlighted AI's role in talent acquisition and operational improvements. Automated investment platforms simplify complex financial processes, reduce time spent on portfolio management, and help employees focus on strategic investment decisions. This improves workforce productivity while ensuring that clients receive high-quality financial services.

Finally, the study revealed that AI tools collectively account for 59% of the variance in workforce optimization, emphasizing their transformative impact on operational efficiency. This finding aligns with Agarwal et al. (2022), who discussed the role of AI in post-COVID-19 business operations, and corroborates Johnson et al. (2021) and Roy and Viswanathan (2019), who highlighted AI's contributions to workforce performance. By automating repetitive tasks, enhancing decision-making capabilities, and improving resource allocation, AI tools enable organizations to optimize their workforce effectively. These findings underscore the need for fintech companies to adopt AI strategically, ensuring that employees are equipped with the training and resources needed to maximize the benefits of AI-driven tools. Integrating AI tools not only boosts operational efficiency but also enhances competitiveness in the dynamic fintech industry.

6. Conclusions

This study highlights the significant benefits of adopting artificial intelligence (AI) tools in the fintech industry. AI applications such as chatbots, fraud detection, and automated investment platforms enhance workforce optimization, streamline operations, and improve efficiency. To remain competitive and meet the rising demand for personalized services, fintech companies must leverage AI-driven solutions for better decision-making and innovation. Investing in advanced AI technologies and fostering a culture of continuous learning will enable fintech firms to lead in industry innovation and achieve sustainable growth. These findings align with previous research on AI's transformative impact on financial services and the economy.

7. Recommendations and policy implications

Fintech companies should prioritize investments in AI research, talent acquisition, and infrastructure to harness the benefits of AI adoption. A culture of innovation and collaboration is essential for effective AI integration and organizational success. Continuous monitoring of AI strategies will help address any challenges. By adopting AI-driven solutions, fintech firms can lead the industry and enhance financial technology globally.

Management should actively invest in AI solutions, foster a supportive culture, and equip employees with necessary skills to meet strategic goals. This includes developing AI strategies aligned with business objectives and industry trends. Talent development and collaboration among stakeholders will further promote best practices and accelerate AI innovation. Embracing these recommendations will position fintech firms for long-term success in a competitive, technology-driven market.

7.1 Contributions to Knowledge

This study significantly contributes to the existing body of knowledge by exploring the adoption and impact of artificial intelligence (AI) tools within the fintech sector, specifically focusing on chatbots, fraud detection systems, credit scoring models, and automated investment platforms. By examining employee perceptions of these technologies, the research sheds light on their effects on workforce optimization, operational efficiency, and innovation in financial services. The findings underscore the transformative potential of AI in enhancing productivity within the workplace, highlighting the necessity for employees to innovate and adapt to these advancements. Furthermore, the study emphasizes the importance of ongoing research and investment in AI technologies to enrich the literature on AI adoption in finance and providing valuable insights for policymakers, industry professionals, and researchers aiming to leverage AI for improved outcomes in the financial sector.

7.2 Limitations and Suggestions for Further Studies

This study offers valuable insights into AI adoption in fintech but has limitations. It relies on self-reported data, which may introduce bias, and is confined to a specific geographical area, affecting the generalizability of the findings. Future research could benefit from a mixed-methods approach, including objective performance metrics and diverse stakeholder perspectives. Longitudinal studies could examine the long-term effects of AI adoption, while comparative studies across regions and industries could enhance understanding of the influencing factors and implications for stakeholders.

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