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IMPACT OF DIGITALISATION ON THE EFFICIENCY OF NIGERIAN EXCHANGE LIMITED

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Abstract

Globally, financial markets have experienced a digital transformation to build investors' trust, promote market access, transparency, transaction speed, and correctness. The study adopted descriptive survey design in order to examine the effect of digitalisation on the performance of Nigerian Exchange Limited. The population for the study is the stockbrokers drawn from the ninety-eight (98) Stockbroking companies duly registered with the Securities and Exchange Commission and accredited by the Debt Management Office (DMO) to sell and distribute FGN Savings Bonds in Nigeria. The study adopted simple random sampling technique and respondents were three hundred and ninety-two (392), four (4) respondents from each Stockbroking firms. Using self-administered questionnaire, the research collected primary data from the respondents. Three hundred and forty-seven (347) copies of the questionnaires were filled and found usable for the purpose of the analysis out of three hundred and ninety-two (392) which were administered. The theoretical hypothesis was tested by linear regression. The data collected were analyzed using Statistical Package for Social Science (SPSS) version 22. Regression results suggested a positive and significant association between the digital payment platforms and transaction speed. The result also revealed that digital finance services significantly affect the investors' participation in the Nigerian Exchange Limited. The study recommends that digital technology is a necessity for the improvement of the operations of Nigerian Exchange Limited, in order to keep pace with the global capital market trends and competition. Therefore, the study recommended that the Nigerian Exchange Limited should in addition to this automate more by adopting more payment solutions that are innovative so as to reduce on processing time.

Key words: Digitalisation, efficiency, digital platform, investors, digital finance, integration

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1.0 Introduction

In the last decade, the entire global transaction and financial systemhas experienced a surge intechnological and internet advancement. Digitalisation is driving significant transformations within the financial landscape globally. With the advent of digital technologies like robotic process automation, artificial intelligence (AI), blockchain, electronic trading platforms, and big data analytics in the stock exchange industryhas revolutionized the way conventional transactions and financial services are offered, and this ongoing transformation continues to draw in investors from various sectors around the world (Iwedi, et al., 2022). Digitalisation has improved the value of products and services over time and facilitated the provision of an efficient financial system with accessible and affordable services. Digitalisation has taken center stage as various industries, organisations, and financial institutions, including capital markets such as the Nigerian Exchange Limited.

The Nigerian Exchange Limited is believed to be one of Africa's largest securities exchange markets that has embraced the digitalisation of financial services and transaction activities like other securities exchange markets around the world, to improve trading processes, promote market transparency, attract both local and foreign investors in compliance with global regulations, increasemarket accessibility, and boosting investors' confidence. Egugbo & Onuorah (2022) postulated that the Nigerian Exchange Limited is a crucial source of economic growth for Nigeria. Digitalisation in the context of the Nigerian Exchange Limited refers to the integration of digital technologies in the operations of the financial market. In recent decades, the Nigerian Exchange Limited has invested in major digital transformation initiatives. In response to the current expectation, the Nigerian Exchange Limited integrated the state-of-the-art digital infrastructure, real-time verification, and integration with the Central Securities Clearing System with the sole purpose of providing transparency, investment security and buildingconfidence among investors. The adopted technologies enable banks to connect their services to the capital exchange platform, thereby facilitating smooth financial transactions that boost liquidity, improve market dynamics and enhance the overall efficiency of the capital market. (Temi, 2024)

The efficiency of the Nigerian Exchange Limited is critical to the growth and development of the financial system in Nigeria and Africa at large. Anwuli et al. (2024) defined efficiency as an organisation capability to provide products or services cost-effective way while maintaining high quality standards. This ability entails enhancing processes, minimizing waste, and improving the utilization of resources. However, in the context of the Nigerian Exchange Limited, efficiency is the extent the capital market facilitates securities and other related services with speed, accuracy, and cost-effectiveness through transparency mechanisms and market information and exchange accessibility. The Nigerian Exchange Limited effectiveness depends on the quality of services it provides (Ogechi, Victor, & Egiyi, 2024). The Nigerian exchange offers vital services that enable companies and the government to gather funds for business growth and developmental initiatives from investors holding shares in these companies, ultimately benefiting all members of society economically (Eyisi & Oleka, 2015; Popoola, 2014). Digitalisation is crucial for providing theplatforms and frameworks to obtainoperational efficiency.

1.2 Statement of Problem

Globally, digitalisation serves as a significant driver for global economic development. The rise of digitalisation has brought significant transformations to the banking sector, resulting in enhanced performance (Onoire & Okoli, 2019; Abbasi & Weigand 2017). Capital markets are

pivotal financial institutions that facilitate the smooth exchange of financial assets. Therefore, the adoption of digitalisation is critical to enhance the operational efficiency of the Nigerian Exchange Limited.

The Nigerian Exchange Limited, like other emerging markets in the world, faces unique challenges such as infrastructural gaps, latency in operation due to inadequate or unreliable network services and, fragmented technologies adoption. An under-utilization of digital technology can result in a loss in global competitive advantages, inefficiencies in operations and stagnation of growth and development of the Nigerian Exchange Limited. These challenges can erode investors' confidence, lead to wastage and high costs of operations and weaken the financial institutions in Nigeria. Yao, et al. (2020) posited that digital transactions and the process of digitization are crucial for the future; however, their economic and financial implications are not fully understood.This present research aims to examine how digitalisation affects the efficiency of the Nigerian Exchange Limited.

1.3 Objectives of the Study

The main aim of the study is to investigates the impact of digitalisation on the performance of Nigerian Exchange Limited.

The specific objectives include:

i. Examine the effect of digital payment platforms on transaction speed of Nigerian Exchange Limited
ii. Access the influence of digital finance services on investors' participation in the Nigerian Exchange Limited

1.4 Research Questions

Following the study's objectives outlined above, the subsequent research questions were formulated:

i. To what extent have digital payment platforms affect the transaction speed of Nigerian Exchange Limited?
ii. To what extent do digital finance services influence investors' participation in the Nigerian Exchange Limited?

1.5 Research Hypotheses

Based on the problem statement, objectives, and research questions of the study, the following hypotheses can be stated:

H_0i: Digital payment platforms do not affectthe transaction speed of the Nigerian Exchange Limited.

H_0ii: Digital finance services do not influence investors' participation in the Nigerian Exchange Limited.

2.0 Review of Related Literature

2.1 Conceptual Review

Digitalisation

Digitization has been defined as the use of digital technology in converting analogue information into a digital or automated format (Andre, 2024). Digitalisation comprises of leveraging digital technologies to alter a business model and open up new avenues for revenue and value creation; it entails shifting toward a digitally-oriented business. Tanpreet & Sadhana, (2017) posited that digitalisation includes the use of digital technologies to reshape business model and create new opportunities for revenue; it encompasses the shift to a digital-centric business.Digitization refers to the seamless, automated, and efficient provision of both traditional and modern banking services through electronic communication networks. This includes the technological systems that enable customers to access their accounts and perform transactions for their businesses through the use of the internet networks (Muriithi& Waweru, 2017).

The present surge of technological advancements defined by significant innovations in areas like AI, the Internet of Things, robotics, big data, quantum computing, 3D printing, nanotechnology, biotechnology, materials science, self-driving cars, and energy storage are all part of what is known as the Fourth Industrial Revolution. During this time, these technologies are converging, making the lines between the physical, digital, and biological worlds increasingly less distinct (Schwab, 2017). Digitalisation is crucial in creating and maintaining business networks through information availability and connectivity by fostering an interactive platform (Quarato et al., 2020). This study defines digitalisation as the adoption of digital technologies for processing and accessing information, processes and systems in order to improve efficiency, interconnectedness and accessibility to financial services across various sectors.

Digital Payment Platforms

Digital payment platforms, often referred to as electronic payment, are a method of payment that excludes the use of physical cash and utilizes digital currency, allowing both buyers and sellers to perform electronic transfer (Wang & Gunawan, 2020). In this process, both the sender and the recipient utilize digital tools to transfer and receive funds. This is often called electronic payment. Digital payments refer to transactions that are carried out or facilitated using digital mobility technologies on portable devices, regardless of their connection to mobile communication networks, and are considered as digital financial transactions. These transactions do not necessarily need to involve banks or financial institutions (Diniz et al., 2011). Digital payment platforms consist of payments made over the internet and via mobile phones and can also be described as any payments transmitted electronically or by internet-capable smartphones and mobile computers. Digital payment platforms encompass transactions performed online and via mobile devices, and it can also be described as any payments transmitted electronically or by internet-capable smartphones and mobile computers (Divyapriya & Velanganni, 2024). Electronic payment involves any financial transaction that occurs through electronic communication methods. It represents a way of utilizing electronic signals that are directly associated with a bank or credit account. Previous studies have observed a global trend of increased adoption of digital payments (Abdulai et al, 2024; Franciska & Sahayaselvi, 2017; Iwedi, et al., 2022; Trütsch, 2020; Kaur, 2025). In general, digital payment involves the use of digital technologies to conduct financial transactions. The emergence of online payment applications such as Apple Pay, Flutterwave,

Jumia Pay and Google Pay etc., online banking, and contactless payment methods has changed how consumers conduct transactions (Economist, 2020).

Digital Finance Services

Digital financial services are technology-based platforms that deliver financial products and services, such as credit, insurance, savings, and payments, using electronic channels. These offerings, which encompass digital wallets, internet banking, and mobile money, enhance customers' access, affordability, and convenience (Johnson & Kumar, 2024). Kolawole, et al. (2024) posited that digital financial services have emerged as a crucial component of the global financial landscape, transforming the methods banking and financial transactions take place.In as similar vein, Pazarbasioglu et al. (2020) described digital financial services as the delivery of financial offerings through digital platforms, including mobile money and fintech solutions, aimed at enhancing service efficiency. They emphasize that these digital financial services improve transparency, efficiency, and accessibility, thereby building trust in financial systems and promoting economic growth. This often entails utilizing electronic and mobile technologies to improve the accessibility, convenience, and efficiency of financial transactions, thereby addressing shortcomings in conventional banking services. Digital financial services enable real-time transactions, decrease operational expenses, and expand the access of financial institutions to underserved or remote communities (Kaliappen & Hilman, 2022). Recent years have seen a notable increase in Nigeria's adoption and use of digital financial services, made possible by elements like rising smartphone adoption, better internet connectivity, and regulatory actions aimed at promoting financial inclusion in the country (Kolawole et al., 2024). In Nigeria, the adoption and utilization of digital financial services has grown significantly in recent years, facilitated by factors such as rising internet access, and legislative measures that support financial inclusion.

Efficiency

Efficiency is a multifarious construct without a generally accepted definition. The concept of efficiency includes different aspects, including management skills, effectiveness, and operational productivity (Lee & Cho, 2019). James and Inyang (2022) described efficiency as how well an organization produces products and provides services to customers with minimal waste of time and financial resources required for delivery. Minh and Quang (2022) argued that productive businesses maximise their resources by converting labour, supplies, and capital into goods and services that generate revenue. The concept of operational efficiency has been highlighted in the context of increasing competition, changing business processes, and technology developments. Operationalefficiency is a measure of how well a firm can use its resources to provide a high quality of service at the least cost. Customers consistently seek improved quality, leading numerous organizations to create strategies for providing assured high-quality products. The capacity to adjust operations and fulfil particular customer needs introduces flexibility (Paula et al., 2018).

Operations of the Nigerian Exchange Limited

The Nigerian Exchange Group acts as the marketplace for trading Nigeria stocks and stands as a prominent integrated financial stock market in Africa.It provides a listing and trading platform for securities, market data solutions, licensing, real estate and long-term financial assets and liabilities. In recent times, the Nigerian Exchange Group was demutualized into three subsidiaries namely; Nigerian Exchange Limited, Regulation Limited, and Real Estate Limited (Jeremiah, 2021; Ayodele, 2021). The Nigerian Exchange Limited, as a subsidiary of

the Nigerian Exchange Group Plc plays a critical role in strengthening the competitiveness of Africa financial capital market and provides services such as listing, licensing, market data solution and investment. It provides a platform for businesses seeking capital and investors seeking for investment opportunities in Nigeria, Africa and across (Nigerian Exchange Group, 2021).

Conceptual Model

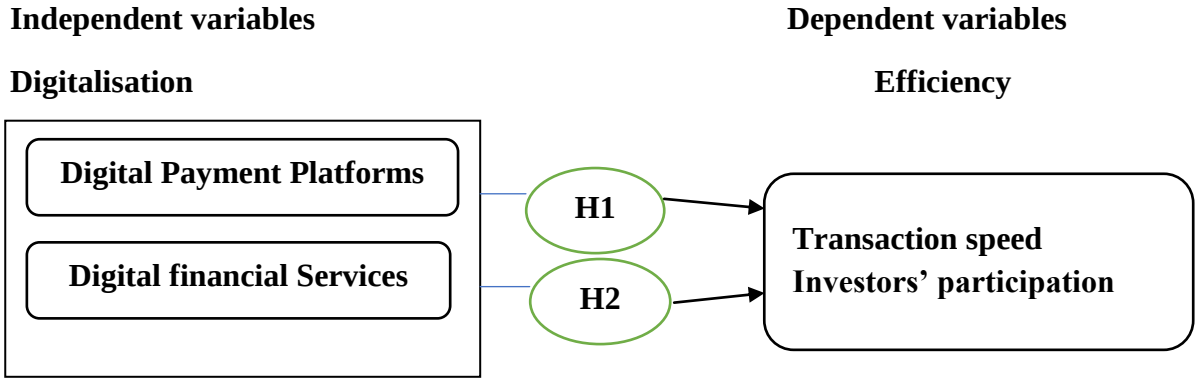


Figure 1. Conceptual Model of Digitalisation and Efficiency of the Nigerian Exchange Limited
Source: The Researchers, 2025

2.2 Theoretical Reviews

The Technology Acceptance Theory

Fred Davis (1989) postulated the technology acceptance theory which states that perceived use of information technology and its usefulness are fundamental beliefs thatdetermine the acceptance of information technology. The perceived ease of use relates to the level of simplicity a person experiences when utilizing a particular system, which includes factors such as adoption, satisfaction, and attitudes toward technology. Consequently, this research will also adopt this model to show how postulated influence affects the adoption of digitization within the Nigerian Exchange Limited, emphasizing on both the perceived benefits and user-friendliness. The theories clarify how digital innovations in Nigerian Exchange Limited, such as digital payment platforms and digital financial services, have demonstrated significant advantages.

TransactionCost Economics Theory
The Transaction Cost Economics (TCE), initially introduced in 1937 by Ronald Coase, posited that firms reduce cost of their economic activity rather than using the open market in order to keep existing. The model examines the expenses linked to carrying out economic transactions and the strategies employed to minimize these costs. Williamson (1975) differentiates between investments specific to transactions and governance mechanisms that help align incentives and lower transaction costs.Transaction cost economics evaluates the efficiency and effectiveness of digital payment systems, emphasizing their ability to reduce transaction costs and improve economic efficiency by enabling faster, cheaper, and more secure transactions (Teece, 2018; Lacity et al., 2020).

2.3 Empirical Review

The study by Iwedi et al. (2022) determined the impact of digitalisation of banking services on Nigerian economy. The research focused on the influence of digital banking channels including web pay and mobile pay on Nigeria's macroeconomic viability. This work used secondary data which were sourced from the Central Bank of Nigeria (CBN) Statistical Bulletin which runs for twelve years (2007-2018) as such was a window of twelve years for the study on digital banking services. They conducted a multiple regression analysis with the number of web pay and mobile pay transactions as the predictor variables and Nigeria's economic performance as the criterion variable. The results indicated a positive and significant relationship between web pay, mobile pay and Nigerian economic growth. This indicates that the digitalisation of banking services is significant for the promotion of the economy. The result of the study implies that more Nigerian consumers are now embracing the use of digital banking services.

Iwedi (2024) investigated the effect of the adoption of digital banking technologies on the operational effectiveness of commercial banks in Nigeria. The findings indicate a significant positive impact of digital banking services on the performance of commercial banks. Panel unit root tests show that all the variables are non-stationary at levels but become stationary at their first differences. Co-integration test results indicate that a long-run equilibrium relationship exists between the uptake of digital banking solutions and banking efficiency. The study recommends that policy makers and other key players in the banking sector should concentrate on formulating and implementing policies that will encourage the diffusion of digital banking technology so as to enhance the productivity and performance of commercial banks in Nigeria.

Isa-Olatinwo et al.(2022) examined the role of digital financial services in the financial performance of Nigeria's commercial banks listed on the stock exchange, using annual financial reports as secondary data from 2012-2020. Descriptive and inferential statistics were employed to analyze the data. The findings revealed that digital financial services significantly influence earning per share in the banking sector of Nigeria. As such, a bank's financial performance and the technology-based financial services are positively correlated. In conclusion, online banking contributed to increased penetration of banking services as a result of their greater availability to the clients, which positively affected the performance of the banking sector. Thus, it is advised from the findings of the study that the management of the banks should pursue digital banking strategies to enhance financial performance in commercial banks.

Mayowa et al. (2019) examined how digitalisation affects commercial bank performance inNigeria. The paper covered 370 rural non-managerial banking officers who were purposively and simple randomly sampled. Data were obtained from a self-developed questionnaire and processed using SPSS version 25. The study revealed a weak but statistically significant positive relationship between digitisation and bank performance ($r = 0.114$; $p < 0.05$) and a stronger positive correlation between product innovation and performance ($r = 0.186$; $p < 0.001$). The research concludes that the straight line projection of the process of digitalisation will considerably enhance the performance of commercial banks, ceteris paribus, provided the process is taken to the logical conclusion.

It can be inferred from the reviewed literature that most existing literature has linked digitalisation predominately to manufacturing, education and banking sectors (Bousrih, 2023; Foluso, 2023; Luiz et al., 2024). Conversely, there still exists a dearth of empirical studies on

the impact of digitalisation on the efficiency of Nigerian Exchange Limited in the Nigerian context. It is on this backdrop that this study seeks to investigate the impact of digitalisation on the efficiency of Nigerian Exchange Limited.

3.0 Methodology

A descriptive survey design was adopted, which objectively sought to examine the extent to which digitalisation affects the operational efficiency of the Nigerian Exchange Limited. The study's population was made up of the stockbrokers from the ninety-eight (98) registered stockbroking firms in Nigeria registered with the Debt Management Office (DMO) for marketing and distribution of the FGN savings bonds. The simple random sampling method was used to obtain a sample size of three hundred and ninety-two (392) respondents, four (4) from each Stockbroking firm. Primary data was collected from the respondents by means of a structured self-administered questionnaire. Out of the total three hundred and ninety-two (392) questionnaires circulated, three hundred and forty-seven (347) questionnaires were received back without any omission and were accepted as valid for the study. The hypotheses were tested with linear regression. The data collected from the questionnaire were analyzed using Statistical Package for Social Science (SPSS) version 22.

4.0 Results Presentation

Hypothesis Testing

H0i: Digital payment platforms do not affect the transaction speed in the Nigerian Exchange Limited

Table 1: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.717[a]	.514	.512	2.52938

a. Predictors: (Constant), Transaction_speed

Based on Table 1 shown above, the R^2 value is .514. This indicates that the influence of digital payment platforms on transaction speed in the Nigeria Limited is explained by 51.4% andthe rest influence can be explained by other variables not included in the equation model.

Table 2: ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	2337.925	1	2337.925	365.430	.000[b]
	Residual	2213.618	346	6.398		
	Total	4551.543	347			

a. Dependent Variable: Digital_payment_platforms
b. Predictors: (Constant), Transaction_speed

Table 2 indicates the value of F-calculated is 365.430 which is greater than the value of F-tabulated at 3.868 at 5% level of significance (p-value=0.000 ($p<0.05$). Hence, the null hypothesis was rejected. Hence digital payment platforms had impacted the transaction speed of the Nigerian Exchange Limited.

H0ii: Digital finance services do not influence investors' participation in the Nigerian Exchange Limited

Table 3: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.579[a]	.336	.334	3.19189

a. Predictors: (Constant), investors_participation

Based on Table 3 shown above, the R^2 value of .336. This indicates that the influence of digital financial services on investors' participation in the Nigeria Limited is explained by 33.6% and the rest influence can be explained by other variables not included in the equation model.

Table 4: ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1781.636	1	1781.636	174.873	.000[b]
	Residual	3525.107	346	10.188		
	Total	5306.743	347			

a. Dependent Variable: Digital_financial_services
b. Predictors: (Constant), investors_participation

Table 4 above, shows that the F-calculated value of 174.873 is greater than the F-tabulated value of 3.868 at a significance level less than 0.05 with a p-value=0.000 ($p<0.05$). Therefore, the null hypothesis was rejected, which states that digital financial services had no significant influence on investor's participation in the Nigerian Exchange Limited.

5.0 Discussion of Findings

The result of the study demonstrated that digital payment system significantly enhanced transaction speed at the Nigerian Exchange Limited. This was the conclusion from the regression test conducted on the two variables. The findings were similar to Rabiu, et al., (2019) in that it was concluded that the digital payment platforms positively and significantly influence operational efficiency of banks. The findings were also corroborated by Haopeng and Aldy (2022) when they stated in their study that digital payments had positive effects on the income and productivity of financial institutions. This is in line with the finding of Babarınde et al. (2024) which states that digital payment channels (automated teller machine, point of sale, mobile payment and web-based payment) and digital finance transactions have a significant influence on stock market capitalization. It further established that digital financial services significantly positively affect the participation of investors in Nigerian Exchange Limited. This is consistent with the findings of Aljanabi (2025), Mona (2024), which show that investors' behaviour is significantly influenced by dfs through making them more knowledgeable and aware via media about how-to gar financial investments. They further revealed that dfis and investors' activities, saving, and investment management were enhanced by the previous variables.

6.0 Conclusion

The adoption of digital technology is crucial in improving the operational efficiency of the Nigerian Exchange Limited and adapting to global capital market trends and competitiveness.Hence, this result leads to the conclusion that Nigerian Exchange Limited efficiency is positively and significantly influenced by digitalisation. Hence, digitalisation is

crucial in the levelling up and participation in the capital market and financial inclusion, as well as in enhancing market accessibility to users and investors. In addition, the provision of financial services via digital channels, especially digital payment platforms and financial information services, is key to enabling transaction speed and attracting investors.

7.0 Recommendations

The study therefore, recommends that the Nigerian Exchange Limited should make more investment in digital infrastructure and adopt more innovative payment solutions such as real-time gross settlement system and block-chain based settlement to reduce processing time. In addition, Nigerian Exchange Limited should embark on a strong digital literacy campaign on the need to create awareness, and train market players especially retail investors and brokers to effectively adopt and utilize the digital platform.

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