DIGITAL ADOPTION OF TELECOMMUNICATION BUSINESSES AND RELATIONSHIP WITH NET SALES PERFORMANCE IN AFRICA: INSIGHTS FROM NIGERIA

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Abstract

The mobile telecoms market in Africa is highly competitive and have significant footprint hence the focus on these sectors. The impact of digital adoption was assessed on the performance of MTN Nigeria Communications Plc and Airtel Africa Plc, which are two mobile communication providers that are listed on the Nigerian Exchange Group as of 2023 an important market in Africa. An Ex Post Facto research design was adopted and secondary data were obtained from official company financial statements, the Nigerian Communications Commission, and another reliable information source for the period of 2018 to 2023. The Pearson's Correlation Coefficient test was used to establish the level of relationship between the independent variable, namely, revenue from digital payment channels, with the dependent variable, namely, net profit. From the above analysis, it can be deduced that the digital payment revenue of MTN Nigeria was on average at ₦44.8 billion while that of Airtel Africa was ₦45 billion with moderate volatilities. However, the net profit for both companies showed much variance due to operational and external influences it was also higher at ₦213.225 billion and ₦226.8 billion respectively. The Pearson coefficient in correlating digital payment revenue and net profit is 0.969 for MTN (signifying significance at a confidence level of 0.031) and 0.859 for Airtel but this is insignificant at a confidence level of 0.141 due to the small sample size. The analyses also highlight the significance of digital payment channels as a key to profitability. It is clear that though net profit was fluctuating more significantly, the increase in digital payment revenue indicated stability and the potential it has for steady income generation. The study suggests more focus on building the infrastructure for digital payments, the use of AI and blockchain, and extending Branchless Banking for bettering revenues and profitability. Other critical factors include operational efficiency and management of strategic actions to changes in economic policies and global markets. This work shows the significance of the research focusing on the impact of digitalization in the telecommunication sector and its implications for the key players

Keywords: *Digital, Adoption, Business Performance, Communication, Mobile*

Introduction

Ever since, the mobile industry of the world has faced many transformations and the outlook of the industry has been made very risky and difficult to attain decent level of profit and growth. As several authors have indicated, this situation can be explained by

low product differentiation, dominance of substitutes, and encroachment on complementary service sectors (Righini, 2020, Ayaga & Nnabuko, 2019). Such factors include; prices have been slashed, the provision of service has been depersonalized, and consumer attributes have transformed over time, which all impact on the realization of higher ARPU and mobile subscriber advances (Gerry & Okeleke, 2016). Even with the high adoption of Smartphone users and broadband subscriptions many mobile communication organizations are facing decreased revenues (Olubiyi, 2022a; Timothy, 2021). This is why most organisations in this sector need revolutionary approaches to come up from stagnation and expand in order to be competitive as observed by Taposh (2014). Of such strategies, the use of technological advancement has been identified as one of the key transformational strategies that has emerged as relevant to fight these challenges. Digital technology is now regarded as strategic for increasing business involvement and leveraging large databases of customer details in enhancing service utility and organizational effectiveness (Nuseir & Aljumah, 2020; Ion & Criveanu, 2016). Its benefits companies by getting market access almost unrestricted, information about customers, customer relations, and improved RoI. Building brand awareness, maintaining reputation, and building clientele relationship have become important imperatives of work and business in the dynamically changing business world (Depino, 2020). It means that firms with immature online presence are severely limited because they cannot leverage the opportunity to boost possible KPIs, or establish business prospects.

The further development of this processes can be observed with the gradual growth to the level of strategic planned investments that mobile communication companies have provided for active implementation of their digitalization programs. These investments mainly concern the management of integration of many approaches to the customer engagement across multiple touch points such as m-commerce, e-communication and marketing, e-payment solutions, and online customer service (Guest et al., 2016; Khairuddin & Olowosuyi, 2020). By such and other digital tools, the consumer behavior can be led, the interactions improved, and the operations accomplished. Over the past decades, firms have moved a significant component of their marketing costs to the web as a defense as well as way of growth since the concept of product differentiation in this economy is almost negligible (Olubiyi, 2022a; Didier, 2002). The growth of the mobile communications industry has continued to be significant for Nigeria because the sector has made tremendous contribution to the country's GDP. Due to liberalization of the telecommunications especially after the start of GSM in 2001 the sector has revealed impressive growth as a result of significant capital inflow (Okonta, 2009; Olumide, 2014). But it is important for one to know that the industry is still flooded and competes keenly even within the African countries only. By competition, in Nigeria it is tackled through the major telecommunication companies; MTN Nigeria Communications Plc or Airtel Africa Plc. These companies are in a quest to reduce their operating expenses and re-invest in other ways to improve net sales, number of subscribers, average revenue per user, overturning churn rates, among others mentioned by Fakoyejo (2019).

However, expansion in the internet connection and increased social networking also supports the requirement for a digital shift in the Nigeria's mobile communications industry. Statista was able to discover that there are 5.5 billion Internet users across the world in the year 2024 making 68 % of global population. Users are still to engage more

in social media platforms, globally the active users will reach 5 billion by 2023, of which China has 1 billion and India 860 million (Statista, 2023). For instance, Facebook and YouTube are some of the most popular platforms worldwide while WhatsApp is for instance in places like the United States where social media is almost indispensable (The Guardian, 2021). As for Nigeria more specifically, the active mobile users engaged in internet activities are 142 million while for broadband it was 40% by early 2022 (Nigerian Communications Commission, 2022). Social media APPs also include WhatsApp, Facebook, and Instagram and X has the most APP activities with 33.9 million APP users in 2021. While comparing the trends in the utilization of technology in teaching and learning a shift in the behavior patterns of people can be defined. For example, a survey conducted in Germany suggests that there is a reduction of weekly time spent on SMS to 5.6 hours among the population of 40 to 49 years old in favour of private messaging and another particular SMS (Welt, 2023). These changes are to support the fact that mobile communication is not an inert activity and that concerning mobile communication, to be efficient and relevant the providers of mobile communication in Nigeria should change their strategic direction (Olubiyi, et al. 2022; Adede, 2017). It will therefore be of strategic importance for organisations involved in this industry to adopt digital management strategies as a means of enhancing performance and sustainability where markets change. With this consideration, this research stands aims at adding to the existing literature by examining the impact of digital on business performances in Nigeria's mobile communication industry. In more detail, the study aims to: Find out the impact of digital adoption on net sales of the mobile communication providers who are listed in Nigeria, Identify the relationship between digital adoption and business performance parameters such as net sales, daily active users and monthly active users, Verify the hypothesis that postulates that, The level of digital adoption does not influence the business performance of the listed mobile communication providers in Nigeria.

In the case of quantitative measures, implications for business will arise in the form of a contrast between daily and monthly active users on one side and net sales on the other side. These research results will help towards arriving at strategic decisions that will allow for investment towards a sustainable future growth in what is very much a competitive market as pointed out by Braggs (2018) and Nuseir & Aljumah (2020). Moreover, knowledge of what could be done to fill the gaps in managing information technologies effectively in order to capture customers' satisfaction and business margins in this fastest growing field is still one of the key aspects which still needs to be addressed, hence the study. A number of previous studies, including a study by Al-Faleh and Khalifa in 2023 have demonstrated how the use of technological innovation is causing changes in business models particularly in telecommunication industries. In similar with this understanding, this study aimed to establish relationship between sides of digital adaptation and purpose of organizational performance indicators of net sales, new subscribers, and ARPU within the Nigerian mobile communications industry. In this regard, this study aims at adding to the existing literature on how the application of information communication technologies can spur improvement in business outcomes especially in developing nations of the poor showing that: The findings will be useful to policymakers, industry stakeholders and practitioners who seek to achieve and orchestrate digital transformation initiatives in integrated and competitive contexts.

Review of Related Literature

Concept of Digital Adoption

Digitalization refers to the processes of implementing and optimizing the use of digital in individuals, organizations and societies to improve the processes, products and services that are on offer. This concept has however received much attention in the recent past, especially because technological advancement has been expanding in the digital discovery at the social, economic, political and cultural developments of societies. Challenged by Campagna and Bhada (2024), it is only possible to achieve strategic digital introduction that brings about the right changes in business by the systematic implementation of various technologies. In its broadest sense, digital adoption is much more than merely the acquisition of new technologies. It defines the adoption of all these tools fully into organizational operations to obtain enhancements. To successfully adopt digital, a number of issues have to be considered.

An important implementing factor is organizational culture, which was an open and embracing to innovations culture facilitates easier implementation and a conservative culture hinders the process. Vimal et al. (2023) also points that out negative perception of technology is a key challenge. Another pertinent determinant is the availability of resources, as Mollet & Kaudela-Baum (2022) pointed out across the SMEs, where generally smaller resources are available in terms of employee count and funds than is the case with large corporations. Furthermore, it requires the existence of sound digital support structures as a prerequisite. However, if the connectively does not exist, or devices are not easily available, then digital transition is not possible especially in the rural areas or any region that is still deemed underdeveloped (Omoyele, et al. 2023; European Investment Bank, 2022). Furthermore, the category of perceived usefulness and ease of use based on Technology Acceptance Model was highlighted to have effect on the adoption of technology as pointed out by Jamalova (2024) in her study of wearable technologies.

Challenges of Digital Adoption

However, there are some challenges that prevent organizations enhance their digital adoption. Lack of awareness as to the benefits that are available from using digital technologies usually results in resistance. Vimal et al., (2023) established that a lack of awareness remains a major issue in many organisations. In the same regard, unfocused goals or doubts about the cost-to-benefit ratio may lead to hesitation, Campagna and Bhada (2024) found in discussing the strategic adoption. Technical issues also act as barriers toward change since it can be difficult for organisations especially when they are unable to afford to employ specialist in specific factors as pointed by Jeleskovic et al. (2023). These are some of the challenges that make it necessary for strategies towards its adoption to be well worked out. These problems have to be addressed by the development of digital skills of personnel by investing in it. The effectiveness of teams to use technologies is promoted by training activities that build digital competency. As for the European Investment Bank (2022) companies across the EU reported that 53 percent of them have already started the process of digitization. The same has some of the following important aspects: It is often influential in establishing tailored purposes, organizing and championing implementations. Campagna and Bhada (2024) highlighted on the strategy of leadership in order to integrate multiple activities towards digital transformation.

Strategic planning on the other hand guarantees that technology adoption is in a right perspective to achieve organizational objectives. Egodawela et al. (2022) present frameworks that help organizations to navigate this transactional change process.

Digitalisation vs Digitalisation Transformation

Today, because of the improvement in the technological software, many organizations associate digitalization, and digital transformations. However, these concepts have entirely different implications and managerial importance within organizational corporations. Digitalization entails conversion of traditional information into digital inputs while digital transformation goes further to capture the utilization of digital tools to reinvent, reconfigure, and develop new organizational strategy, work processes, business setup, and customer-facing technologies to the clients (Hess et al., 2020). Digitalization can be described as the process of changing information from the physical or analog format to digital format. In the broadest sense it is therefore simply about how various tasks that were formerly being completed manually could be automated by purely using technology. For example, converting conventional official papers into electronic forms of documentation is a classic example of digitalization. This process is all about enhancing efficiency, reducing the human interference with such material, and making it easier to share the information (Vial, 2019).In general, the most evident example of how the digitalization is effective can be seen in such sectors as healthcare. Electronic Health Records (EHRs) are the electronic documents that hold information that can be stored, accessed and transferred and this make it possible to access information in regards to time and accuracy according to Parviainen et al. 2017. Likewise, manufacturing digitalization means that it is necessary to use tools, for example, CAD to replace drafts that were made by hand in the past. That said, digitalization is for the most part perceived mainly as a trend towards an increased extent of innovation. It elaborates existing approaches and activities but does not necessarily infer redesign or change to them. This differentiation is important when it considers digital transformation that often reconstitute organizational work arrangements.

Digital business transformation is a broader and more intentional process of applying IT across many fronts of the firm and therefore entails much wider changes in the business value proposition. But it cannot be a mere robotization of an operation or an acceleration of a business process Digital transformation means the transformation of a culture and the ways business is conducted and customers satisfied (Gartner, 2015). The other benefit of digital transformation is that it is customer-centric. For instance, Amazon Sam which revolutionized the retail sector by connecting data analytics, artificial intelligence and the cloud to serve customer focused retail solutions (Kane, et al., 2019). Similarly, the recent EV is not only Tesla's contribution to the automobile sector but also a feasible system that is constructed with software, battery technology, and application of autopilot. Digital transformation has therefore been associated with change disruption of current patterns and changes in the business systems. It may encompass System innovation for instance by changing business organization structures from product centred towards services such as 'per use' or by creating platform business networks platform. For instance, the concept of digital transformation changed Netflix from DVD rental Service Company to a powerful streaming company.

Challenges and Considerations

With reference to the advantages on its part digitalization and digital transformation both have various advantages though it comes with some disadvantages. The challenges include; in area of digitization, they are faced with challenges like archaic system, lack of technical know-how as well as organizational resistance to change as identified by Parviainen et al., (2017). Meanwhile, the digital transformation activities have broader problems like stakeholders' coordination, ways of implementing, and protecting the firm against cyber threats in the digital systems advanced by Kane et al. (2019). Another issue that has to be addressed to the executers is the fact that digital transformation is not a one-time event. And while digitalization is seen as a kind of program where some project is done to its end, digital transformation is seen as an ongoing process that continuously evolves to incorporate new technologies and react to market changes. For instance, the sector, which has effectively implemented the digitalization standards, is still in the process of investigating other methods, such as blockchain and artificial intelligence to meet customer needs (Vial, 2019).

Digital Adoption and Mobile Communication in Nigeria

The general Mobile Communication Technologies together with the qualitative advancement in the decisions of the general Mobile devices' points toward a qualitative change in the adoption in the general digital technologies in Nigeria within the last ten years. In the 2023, the active internet users are more than 90 million and based on the above stated study by Nweke et. al., (2022) mobile communication has become the most popular way of online communication in the country. Some prior works have confirmed that dynamic prices reduction to smart phones and improved accessibility to mobile broadband networks have connected further part of disconnected people online (Adepoju & Olayemi, 2021). Therefore, usage of mobile communication affected the social relationships and altered some sectors such as banking, health and education. (Fadairo et. al., 2023). Similarly, there has been the use of mobile applications in delivering telemedicine especially in the year 2020 due to the role played by mobile communication the extend possibilities of healthcare (Okonkwo & Obioha, 2021). The federal government of Nigeria has also patronized the adoption of the policy and strategies such as National Digital Economy Policy and Strategy (NDEPS) for promoting better socio-economic development (Usoro et. al., 2022). Many communications big shots including MTN Nigeria, Airtel Nigeria, Globacom and 9mobile have in one way or the other played a pivotal role in the digitization process. MTN Nigeria has come up with 5G technology to enhance IPS and connectivity while Airtel Nigeria has also developed mobile financial service technology in the form of SmartCash Payment Service Bank. They have also boosted the general utilization of the different product offers in the form of varied digital tools and platforms including Glo with the unconventional data offers and 9mobile whose major focus is essentially on data (Ogundele et. al., 2022). Nevertheless, there exist some level of pre-judice, for example, costly data, volatile power supply, and low e-skill particularly among the locals (Amankwah-Amoah et. al., 2022). Addressing these barriers is necessary to propel the trends on digital adoption and mobile communication to continue creating the greatest socio-economic value.

It was seen that among all the modern social networks, Instagram and WhatsApp are the most used today by small business owners who advertise their activities and communicate with buyers. Using such platforms to access markets has not only created

new markets for them but has also exposed the conventional opportunities for employment and innovation to a new realm. However, there is empirical evidence that the use of mobile communication enhances civil participation and the working of government in Nigeria. The use of mobile communication has emerged as essential for political activism and call for a right of accountability such as #EndSARS protest in Nigeria (Olorunfemi et. al., 2022). Nevertheless, some of the challenges continue to be felt through poor network coverage and unstable electricity supply among other infrastructural pulls and penalties (Okoro, et. al., 2021). Mobile communication is one of the key prerequisites of development of the rural area; however, it is necessary to make the proper attempts to improve the development of the rural communications and offer affordable telecommunications products. Mobile communication has also advanced self-employment of people in the context of the various gig economy in Nigeria. Social media business application popular today like Uber bolt, and digital service selling platforms like Fiverr has opened more employment opportunity for the youths of Nigeria. All of them incorporate mobile communications to connect the service providers to the purchasers, stressing the importance of connectivity to the economy. However, similar challenges as to job insecurity, income uncertainty, and pardess Workers 'rights also exist with the gig economy and require policy regulation (Egbuniwe, et. al., 2023).

Business Performance

Business performance comprises the assessment and appraisal of the success of organizational operations in the achievement of stated goals and objectives, common to which are; profitability, customer satisfaction levels market share and operational productivity. Social and sustainability performance indicators have emerged as being increasingly relevant in recent years because of changes in stakeholders' expectations (Kaplan & Norton, 2021). Balanced scorecards have assisted organisations in the achievement of strategic management by incorporating a number of factors alongside the financial aspects of an organisation thereby enhancing the assessment of organizational performance (Olubiyi, et al., 2023; Neely et. al., 2020). Furthermore, digital change has become an essential driver of business outcomes, where data analysis Artificial Intelligence, and cloud solutions as key enablers of automating and improving organizational performance (Olubiyi 2024c; Olubiyi, Lawal, & Adeoye, 2022; Olubiyi, 2023; Chui et. al., 2022). Human capital is the other driver of business performance since it involves human resources that can make huge differences through inventiveness, productivity and positive impact to clients. Appraisal studies have revealed that training, proscribing of measures, and employee engagement affiliated movements influence organizational performance (Avolio et al., 2020). Moreover, leadership gives critical leverage with regard to achieving business goals. Leaders who apply the transformational leadership behaviors associated with vision, flexibility as well as employee enablement are known to deliver higher employee performance and organizational results (Bass & Riggio, 2021). There have also been acknowledgements of how technology has helped to support another important facet of business performance, namely process improvements. Organizations that implement digital tools like ERP and CRM have improved the communication of data across their departments and improved organizational performance and decision-making (Davenport & Ronanki, 2022). Likewise, flexibility to adapt to market changes has risen as a key determinant of maintaining business rates of performance. Companies that embrace and encourage agile and perpetually iterated approaches for managing change initiatives are in a much better

place to cope and capitalize on emerging risks and opportunities (Rigby et al., 2021; Olowoporoku, & Olubiyi, 2023).

Net Sales

Net sales are the total sales revenue of a company excluding returns, allowances and discounts on sales. This metric is another crucial characteristic of an organization's financial stability and business performance, which shows the efficiency of the sales and customers' service management (Mankins et al., 2021). While gross sales may present an overall picture regarding the total revenues, net sales give a clearer picture of the actual revenues that this company earns allowing for the fact that certain deductions affect the overall profit on sales (Grant et al., 2022). The increasing trend in e-commerce and digital marketing has also affected the trend in net sales to the extent that many companies are now able to increase their standings and operational efficiency when it comes to sales (Chen et al., 2021). For instance, businesses that utilize data analysis to optimize customer experience always record high net sales (Smith et al., 2022). Further, the retail and consumer goods industries in particular have also included omnichannel, which involves the management of both online and offline sales, to contribute to the net sales of businesses, as these channels the convenience factor in customer purchase (Johnson et al. 2022). Nonetheless, factors like competition, market conditions, and shift in consumers' buying behaviour may affect the net sales, which makes organisations to always evolve their ways of selling (Taylor et al., 2021).

Subscriber Growth and Active Users

This subscriber growth of MTN and Airtel in the Nigeria depicts the ever-growing mobile communication in the region which is fueled by connectivity. MTN Nigeria Communications Limited is absolutely the leading telecoms firm in the country; it has more than seventy-five million subscribers at the moment which gives it nearly 39 percent of the market share (Olowe et al., 2022). Airtel Nigeria comes next with 60,000, 000 subscribers being nearly 31percent of the market (Adeyemi et al., 2022). These figures have been attained through strategic investment in networks and qualitative customer solutions by both firms. The number of DAUs for MTN and Airtel have risen because of the increased mobile app and platforms usage, where MTN users are over 40 million and Airtel has over 35 million. Other metrics, such as Monthly Active Users (MAUs), which capture a more diverse interaction, have also surged; MTN boasted 60 million MAUs along with Airtel's 50 million (Folarin et al., 2023). 5G networks and Airtel and MTN's attempt to provide connectivity to the rural areas has also supported its market standing. Nonetheless, the two providers stay & grow apace in Nigeria's dynamically challenging economic environment, including inflated rates & oscillating exchange, to constantly evolve their business models as key drivers of the nation's telecommunication industry (Chukwu et al., 2022; Eze, et. al., 2023).

Churn Rate

Churn rate which is the customer relationship or access subscription/service cancellation rate in a period is another essential measure for monitoring and analyzing business continuity. The churn rates currently average 15-20% in Nigeria depending on the quality of the network, price war and adequacy of customer service. High churn rates can show that customers are not happy or maybe competitors are mandating extra attention hence a high importance to companies that need to have lasting positive profit margins. Other

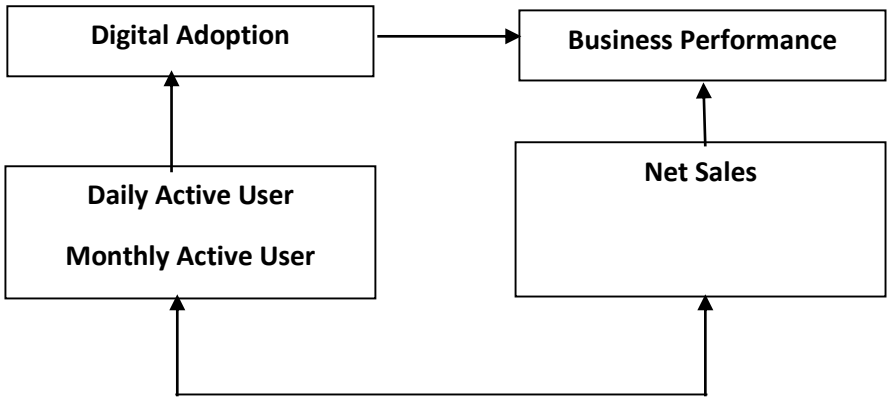
measures which have been used include creating customer segmentation, enhancing the quality of the network, and launching loyalty programs all of which have ensured low churn rates (Anderson et al., 2021). Still, on customer privacy, MTN and Airtel have also used predictive measures to capture clients at the edge of churn and then attempt to solve them and retain their business as has been explained by Ibrahim et al. (2022). In the same way, the use of artificial intelligence in the provision of customer service has helped telecom providers to improve the delivery of responses to questions, increase utility and reduce churn (Smith et al., 2021). Other non-service attributes service providers need to consider include: Cost related drivers like inflation and currency devaluation affect churn since the customer will look for cheaper substitutes during turbulent times (Taylor et al., 2021). But, in the long run, telecom providers that catalogue a user's requirements and work assiduously to enhance the firm's service offerings have comparatively less churn and increased customer retention (Chen et al., 2023; Rigby et al., 2023; Ukabi, et. al. 2022: Uwem, et al., 2023).

Theoretical Review

There are quite a number of theoretical frameworks that can help us analyse the relationship between the level of digital adoption and business performance of the listed mobile communication provider firms in Nigeria. Perceived usefulness and ease of use discussed in the technology acceptance model, determines the level of acceptance of digital systems by individuals (Venkatesh and Bala, 2008). This model is most suite to explain how the mobile providers are using tools like digital payment systems and customer service platforms in order to increase operational effectiveness and customer satisfaction. Likewise, the diffusion of innovation theory enlightens concerning the selection, implementation and spread of innovations such as mobile application and artificial intelligence services within the industry, where elements such as the relative advantage and compatibility are valued extensively (Straub, 2009). Another related theory is the dynamic capabilities theory which look at the capability of a firm to configure, integrate, and reconfigure organizational and environmental resources with the purpose of creating new competencies to address the demands of a shifting technological and market environment (Eisenhardt et al, 2000). This is even more important in a dynamic area such as telecommunications industry.

Of all these frameworks, the Resource-Based View is the best suited for this study. This theory is centered on ability of firms to acquire, deploy and transform their internal resources such as digital network, information technology and analytics in order to gain and maintain competitive advantage (Olubiyi, 2024a; Olubiyi 2024b; Grant, 2020). This view is immensely relevant to the study since it aims to analyse how mobile communication providers in Nigeria create value by managing its digital resources for business performance enhancement. From the studies, Resource-based view theory is most useful as it links digital adoption to outcomes such as profitability, customer-retention, and market share. Also, it also makes a point to manage the resources carefully because the competitiveness of different industries determines the use of resources. With reference to the resource-based view, this work develops an effective model for studying the importance of digitalization for restructuring business activities and sustaining competitive advantage in the telecommunications industry.

Conceptual Framework



Researchers' Conceptualization (2024)

Empirical Review

Some prior research work has investigated the effect of digital on the business performance of enterprises in various settings, which is relevant to the present research investigating Nigeria's listed mobile communication providers. Silva et al. (2019) consolidates digital transformation with firm performance measurement in the European Telecommunication sector by employing sampled firms of 150 organizations adopted through the structured random sampling technique. The survey revealed that use of sophisticated solutions like cloud solutions and artificial intelligence enhanced operations by 25 percent and revenues by fifteen percent. The authors reaffirmed that the integration of digital strategies and organizational goals plays an important role in enhancing benefits and this study also endorses that strategic alignment should be considered as high priority during implementation. While the current study is being conducted on a developing economy, this research was conducted in an area where there was a strong advanced digitization. Kamau and Wanjiru (2020) investigated the effects of digital technologies with 200 SMEs in Kenya through purposive sampling. According to the outcomes of their study, the introduced elements of digital marketing technologies, mobile payment systems, and online platforms helped to raise customer appeal and sales by 30%. Therefore, they affirmed that digital adoption is crucial to SME development in developing countries, although there are hindrances including cost, and a shortage of technological talent. To further the adoption, they suggested things like subsidies and training programs supported by the government. This study is nevertheless different from the present one in terms of its population of interest: SMEs are targeted instead of large, listed mobile communication firms.

In Nigeria, Adebayo and Yusuf (2020) adopted systematic sampling to establish the application of mobile applications in enhancing the profitability of 50 telecommunications firms. From the research, it was revealed that firms that used mobile apps in engaging their customers realized increased revenue by 15% and improved customer loyalty. They established that; mobile applications are an essential strategic enabler of organisational performance in the telecommunications industry and called for enhanced investment in application and customer interface. Although related, this study puts its emphasis on mobile apps while the present investigation has a wider perspective on digital technologies. Another study by Adeniyi et. al., (2022) on Nigerian digital infrastructure and business performance of the telecom firms adopted convenience

sampling to select 60 firms. The research also discovered that giving more funds to digital networks led to enhanced network reliability and customers' satisfaction by 35%. The authors took the conclusion that such external environment factors are critical for maintaining the business performance in the telecommunications industry and called for ramping up the collaborations across the private sector and with the government to fill gaps in the digital infrastructure. Several similar works for the present research exists; however, this work emphasizes infrastructure's use, whereas the current study takes a wider view of digital adoption.

Lastly, Souza and Pereira (2021) assessed the casual relationship between digital adoption and financial performance in the telecom industry of Brazil using systematic sampling of 50 firms. According to their analysis, they noticed significant enhancements in profitability and return on investment by 18% with digital solutions yet the regulations slowed down the adoption rate. For the same, they unveiled that regulating structures play a crucial role in determining digital uptake and called for the reduction of these regulations. Though this study compares Brazil and Nigeria's environments as two developing economic systems, this work is mostly convergent on regulatory inhibitors compared to the present work, which takes into account other factors such as infrastructural and adoption considerations.

Methodology

This research employed Ex Post Facto research design, as the researcher used secondary data only in this study. Akinlua, (2019) define Ex Post Facto research design as one in which the researcher does not interfere with the independent variables. The rationale for this design is based on cost and time efficiency, relation to the overall study aim, and impossibility to control variables. The target population of this studies comprises MTN Nigeria and Airtel Africa PLC (Airtel Nigeria Limited) which are the only mobile communication providers listed on the Nigerian Stock Exchange as at the time of this research in 2023. Polit and Hungler (1993) pointed out that a population is a total number of subjects or elements possessing certain characteristics, while a sample is a portion of the total population. For the purpose of generalizing the results with high probability, a sample size of four years from 2018 to 2021 was chosen. This period was chosen to examine the data pre listing (2019), at listing (2020), post-listing (2021) and during the easing of COVID-19 health restrictions (2022) as all the Companies' annual reports were complete.

To gather data only from these companies a purposive non-probability sampling technique was adopted in this study. At the time of writing this paper in July 2023, MTN and Airtel were the only mobile communication providers that were listed on the Nigerian stock exchange to justify this sampling approach. Data was collected through official records of MTN Communications Plc and Airtel Africa Plc Company financial statements combined with data from the Nigerian Communication Commission through the firms' official websites and other online resources such as news articles, journals, etc. The design of Ex Post Facto used in this study allowed the researcher to obtain data prior to and after the COVID-19 crisis, in addition to what Jurd de Girancourt et. al. (2020) proposed, to provide a more inclusive investigation of the digital adoption. According to Biddex (2019), validity is specially singled out to show the extent with which instrument functions the way it was intended to. Validity considerations of the instrument did not

arise for the study because, it was based on secondary sources such as financial statements and regulatory publications (Vangala, 2020). In the same manner, when applied, reliability or the ability to obtain similar and repeatable results (Biddex, 2019) was established through the adoption of accredited secondary data sources. The independent Variable X was operationalized as total income received from digital payment channels while the dependent Variable Y was operationalized as net sales. The research data was gathered through an annual report from the official website of the companies under consideration and the Nigerian Communications Commission. These reports were compiled in a Microsoft EXCEL database and analyzed by Statistical Package for Social Science (SPSS). In analyzing the relationship between variables, the Pearson Correlation Coefficient technique was applied. This method was justified because the variables measured were quantitative, had different units of measurement and showed a linear relationship.

Result and Discussion

Table 1: MTNN Communication Plc, Revenue from Digital Payment Channels Vs Net Profit

Descriptive Statistics

	Mean	Std. Deviation	N
Revenue from digital payment chanel (Billion NGN)	44.800	18.4413	4
Net profit (Billion NGN)	213.225	63.3206	4

Correlations

		Revenue from digital payment chanel (Billion NGN)	Net profit (Billion NGN)
Revenue from digital payment chanel (Billion NGN)	Pearson Correlation	1	.969*
	Sig. (2-tailed)		.031
	N	4	4
Net profit (Billion NGN)	Pearson Correlation	.969*	1
	Sig. (2-tailed)	.031	
	N	4	4

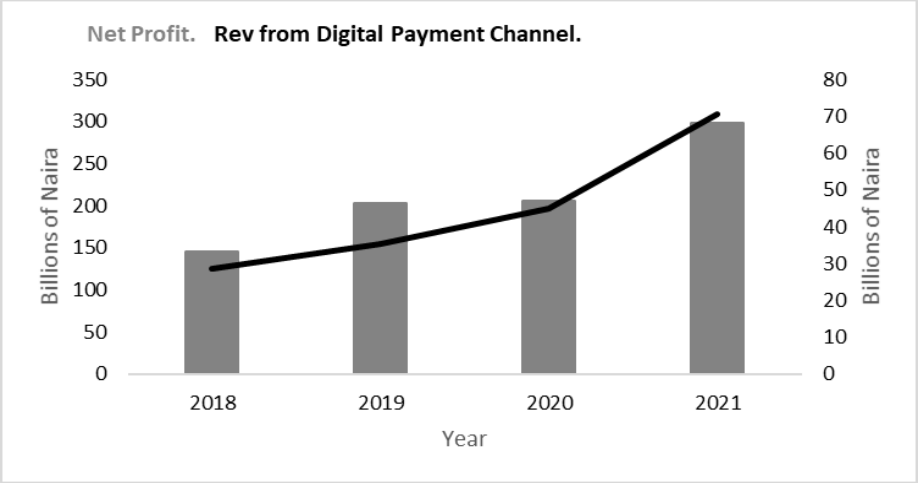
*. Correlation is significant at the 0.05 level (2-tailed).

Source: Researchers' computation (2024)

As reflected in Table 1, the descriptive statistics imply that the mean revenue obtained from digital payment channels stands at ₦44.8 billion with standard deviation of ₦18.44 billion meaning that there is moderate variation in revenue across the year. This underlines a gradual, yet incessant and stable, growth of the digital payment revenue as a source of income in the period under analysis. However, the average net profit is higher at ₦213.225 billion and this denotes higher volatility from year to year as the standard deviation is at ₦63.32 billion. These figures present a picture indicating that revenue via digital payment channels is less volatile than net profit, which can be a measure influenced by a number of factors including operating efficiency and market productivity and may be subjected to external factors such as new economic policies. To further understand the nature of this relationship, a correlation analysis of these two variables is done. It reveals that the value of Pearson correlation coefficient = 0.969 which signifies a very strong positive relationship between the amount of revenue generated by digital

payment channel and its net profit. This shows that if there is an increase in the revenue from digital payment channels, the net profit will increase sharply. The extent of this relationship illustrates the importance of the digital payment channels that drive the profitability of businesses within this sector. Moreover, the calculated p-value of 0.031 indicates that this link is statistically significant at the 395 level, which means that positive relations are not random fluctuation but actual business reality. Thus, this statistically significant correlation supports the idea of further investment in digital payment technologies to improve financial results. Furthermore, the fact that a small sample size (N = 4) was used in all the analyses provides reliability in the conclusions drawn from the study. This is systematic and reflection of a strong relationship between the two variables; net profit and digital payment revenue across this four-year period. The strong positive relationship also indicates that digital payment revenue is an important revenue that companies can leverage to sustain profitability. They are therefore key in supporting this sort of growth trajectory especially in terms of investments in digital technologies and payment infrastructure.

These results stress the need for an enhanced focus on digital pay infrastructure within the scope of organizational initiatives. While net profit is more variable, the focus of digital payment revenue ensures that relying on digital systems is an important and correct direction toward stable, predictable growth. Organizations that do not embrace the digital change interface risk being left out from the gains that digital payments have to offer. On the other hand, the organizations that integrate their functions with the perspective of digital transformation not only enhance the rate of net profit but also obtain the prospects of gaining a competitive advantage in a highly dynamic environment. ***Chart I:*** Chart showing the relationship between adoption of digital payment channels and net profit of MTN Nigeria Communications Plc



Source: Researchers' computation (2024)

This chart analyzes the correlation between net profit, shown on the left-hand side, in billions of Naira, and revenue from the chosen digital payment channels shown on the right-hand side, also in billions of Naira, in the period of four years from 2018 to 2021. The green bars are net profit while the black line is the digital payment channels' revenue, and with this GDS developed a method of presenting the two in relation to each other over time.

As it can be observed from the data, there is a rising trend in both net profit and revenue derived from the digital payment channel in the observed period. For 2018, net profit remained comparatively small, below ₦150 billion, and revenue through digital payments stand at below ₦30 billion. It is important to get the baseline period during which growth starts and show the first level of digitization. This force speaks that the relatively low amount of digital payment revenues that during that period indicates that businesses were still in the process of experimenting with different methods of going digital. This year sets the benchmark of the subsequent growth of the New Year.

By 2019, there is a considerable relative increase in the two indicators: while net profit tops over ₦200 billion, the digital payment revenue increases to almost ₦40 billion. This improvement also shows that the choice and usage of digital payment channels is slowly increasing and these results are positive on the overall profitability. This impressive rise between 2018 and 2019 indicates that initial investments in digital platforms started paying off and represents a positive trend in the degree of digitisation. The growth path slows down in 2020, but net profit continues to grow steadily and crosses ₦250 billion; while digital payment revenue is over ₦50 billion. This year is characterized by continued expansion of digital payment platforms as a vital factor to financial performance. However, the COVID 19 crisis seemed to have hit the global economy and businesses look to have used the digital payment channels to sustain the profitability of their firms. This implies that the pandemic had an era to digital since firms adjust to consumer trends and operations disruptions. The revenue results show that the growth highest by 2021 reaching a net profit of approximately ₦300 billion and digital payment channel revenue exceeding ₦70 billion. The steep rise seen in this final year underlines the growth in the dependency of these players to digital payments to improve profitability. That is why the rapid growth of these activities fully speaks about the need for the further development of digital channels because business depends on them to optimize revenues and improve efficiency. The trends of the changes of both these measures over the years also support the positive relationship between the digital payment channel revenue and the net profit proved by earlier statistical analysis and stress on the role of digital in the current day financial process.

Table 2: Airtel Africa Plc, Revenue from Digital Payment Channels Vs Net Profit

Descriptive Statistics

	Mean	Std. Deviation	N
Revenue from digital payment channel (Billion NGN)	45.000	16.3562	4
Net profit (Billion NGN)	226.800	106.8252	4

Correlations

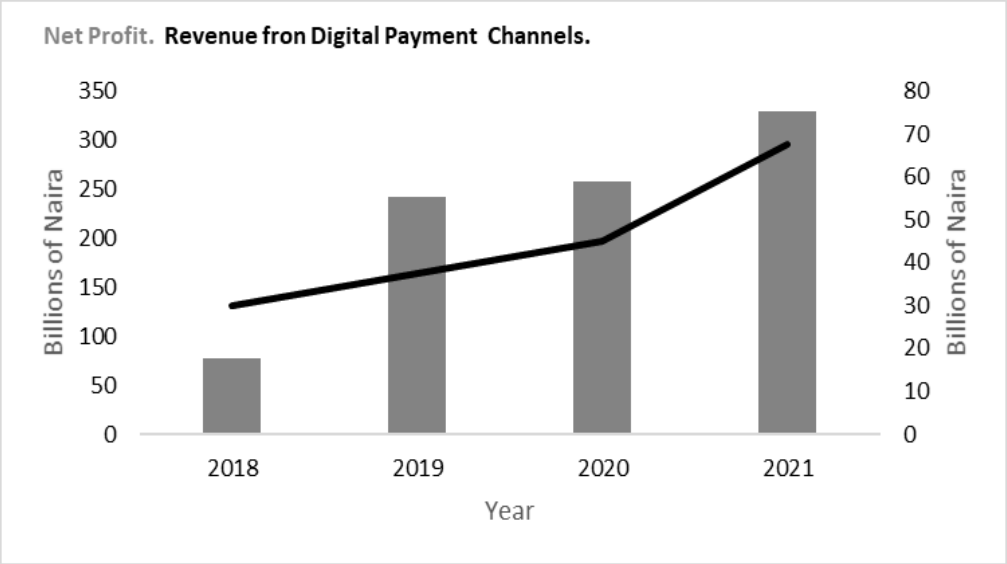
		Revenue from digital payment channel (Billion NGN)	Net profit (Billion NGN)
Revenue from digital payment channel (Billion NGN)	Pearson Correlation	1	.859
	Sig. (2-tailed)		.141
	N	4	4
Net profit (Billion NGN)	Pearson Correlation	.859	1
	Sig. (2-tailed)	.141	
	N	4	4

Source: Researchers' computation (2024)

The Table 2 above shows the summary statistics followed by correlation statistics of the digital payment channels as a revenue (in Billion NGN) and net profit (in Billion NGN) with a sample size of 4 observations. The results on the descriptive analysis of the variables show that the mean of the revenues from digital payment channel is 45000,000, 000 NGN with the standard deviation of 165.362 NGN. This shows moderate volatility in the sample regarding revenue thereby improving digital payment channel earnings. By contrast, there is a much higher mean of net profit amounting to 226.800 Billion NGN though, which shows much variability in the mean as indicated by the calculated standard deviation of 106.8252 Billion NGN. Looking at the nature of net profit above the line revenue we can see that it has reasonably higher variation compared to the variation in the revenue and this variation above the line or other factors that affect profit or profitability may include operational cost, market condition or other streams of revenue. The cross-correlation analysis also gives further light into the nature of these relationships. The analysis of revenue through digital payment channels suggests the positive Pearson coefficient of correlation equal to 0.859, which means that there is a strong positive relationship between the revenues through the digital payment channels, including the net profit. This thus implies that even as the amount of revenue earned through the digital payment channels goes up, so does the net profit, which may further underline the revamped role of the digital payment channels as the key driver of profitability. However, this correlation is not very strong due to the fact that the $p = 0.141$ (Sig. 2-tailed) which is greater than the criterion level of 0.05. This means that the considerable level of correlation, which may be achieved, still is not sufficient to indicate the presence of a causative association in the overall population. Many of the differences could be due to the small number of subjects (N=4) because there is often low statistical power when the group size is small. Since such a small amount of data is collected, conclusions cannot be made or results extrapolated to the sample population. This is because in the cases of retesting and when we use a small sample size, we are at a higher

risks of type II errors which undermines the confidence on the observed results given it might produce results with no relationships where in real sense they exist.

Chart II: Chart showing the relationship between adoption of digital payment channels and net profit of Airtel Africa Plc (Nigeria)



Source: Researcher's computation (2024)

The chart above shows the monthly net profit (displayed in green bar) and the revenue through the digital payment channel (black line) for the fiscal year 2018 to 2021. This analysis shows fluctuations and trends over the years in both the variables and shows a positive relationship between the two. Looking at chart, there is a consistent progression in both net profit from the digital payment channel and the revenue from 2018 to 2021. The green bars that represent the net profit in the scale of billion naira also revealed an increasing trend. In year 2018, the net profit starts at a much lower figure, below 100 billion of naira and then has been increasing every year to a figure much above 300 billion of naira in the year 2021. This is the continuation of an upward trend that points to improved performance in total profitability during this period. Likewise, one gets a positive slope on the horizontal axis representing revenue through digital payment channels, which is depicted in the black line. The revenue increases annually, beginning at a value of 50 billion naira in 2018, and reaching an amount above 70 billion naira by 2021. The progressive rise in digital payment revenues also indicate the growing role and usage of digital payment solutions throughout the period under consideration. The fact that both the net profit and the total digital payment revenues show an increasing trend, the two values may be connected. The rise in digital payment revenue also correlates, and seems to proportionately aid net profit, possibly pointing to how digital payment channels could be a driver of profitability. This is in line with the hypothesis that investment in Digital Payment Systems may be one of the drivers to financial performance. Performance chart also indicates that net profit increases at a higher rate than the revenue for digital payment. As they both increase over the same period, net profit shows a steeper slope, especially between the periods of 2020 and 2021. This might suggest the presence of other factors that would affect profitability, for instance effects

from other cost efficiencies, revenue diversification or higher market shares in other segments.

Conclusion and Recommendations

This paper examines the impact of digital adoption on business performance of the selected mobile communication providers listed on the Nigerian stock exchange, specifically MTN Nigeria Communications Plc and Airtel Africa Plc. Nonetheless, the digital payments revenue and net profit of the two firms improved consistently during the period covered, which confirmed the role of digitalization in the telecommunication sector. Digitized payment revenues for MTN Nigeria on average was ₦44,800,000, 000 with moderate fluctuation while Airtel Africa on average recorded ₦45, 000, 000,000. Nonetheless, the net profit by both companies showed more likely higher averagely; ₦213.225 billion by MTN and ₦226.8 billion by Airtel but has more fluctuations showing external and operational factors much more. The results of Pearson correlation coefficients depicted few positive courses between digital payment revenue and net profit, which were 0.969 for MTN and 0.859 for Airtel. Though the estimates for MTN were statistically significant at 0.031, estimates from Airtel were insignificant at 0.141, thanks to the small cross-sectional observation of four. Nevertheless, these observable trends clearly show that digital payment channels are central to driving profitability. Notably, both firms had the improved net profit in between the two stated years; however, other factors, inclusive of cost efficiencies and market adaptations, must have equally influenced this rate in the two companies. In general, therefore, a call is made toward acknowledging that the adoption of digital payments is a valuable business agenda that should be incorporated optimally since it can substantially boost profitability. Even though net profit was much more volatile, the progressive increase in the revenue from electronic payment points to the stability of this revenue-stream. Therefore, the following recommendations are made. The investment in digital payment system has to be pursued effectively by both the companies to support more platforms and create longer and broader access point that should increase the company's revenues. AI and Blockchain are two modern advancements that can redesign payment methods and promote secured processes for payment. Firms should also collaborate with other agencies or players in the markets in order to include the financially excluded population in their market as a source of revenue. One of the company's key concerns should be the management of operations, where costs savings and efficiency improvements should also assist in lowering profit fluctuations and thus improving business results. The movement of economic policies as well as the global market requires periodically analysing its effects in the promotion of duality of payments and position competitiveness. Moreover, a focused campaign for the promotion of adoption of the digital payment platforms together with friendly user interfaces will enhance their adoption and usage further still.

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