



Technology and Its Role in Product Development: An Empirical Study of Nigerian Banking Industry

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ABSTRACT. This study examined the role technology plays in enhancing product development as part of the intensive growth strategies of banking organisations in Nigeria. Exploratory and empirical survey research design were used to conduct this study. Five leading and major Nigerian commercial banks were chosen as sample for this study from about 25 commercial banks operating in Nigeria. Primary data was employed through scheduled personal interview sessions whilst secondary data was obtained from documentary sources all of which are aimed at finding out how banks use technology to implement product development strategies. The data obtained were analysed and empirically supported by specific instances of banking products developed through the use of technology. The findings of the study confirmed that Nigerian banking organisations use technology as a major means of implementing and achieving product development. Specifically, technology is deployed in the process of introducing new products, developing related products and creating variants and features of existing banking products and services. In conclusion, this study deduces that technology is directly and positively related to improved product development in the Nigerian banking industry. This implies that banking organisations in Nigeria should continue to invest in technology for deployment to adequate product development in order to achieve market growth and remain competitive.

Key Words: Technology, Product Development, New Products, Existing Products.

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I. INTRODUCTION

Technology remains a strategic resource to organisations in various ways. It plays diverse critical roles in the successful management of today's organisations. Technology's role in organisational strategy is even more significant. For Tassey (2012), technology is one primary factor that influences strategy. According to Mahmood, Amir, Javied and Zafar (2013) technology is a key factor in formulating business strategies for organisations to achieve growth and remain competitive. Accordingly, Idigo and Onwudiwe (2023) noted that technology influences the process of strategy formulation, implementation and control; just as Kihara et al. (2016) concluded that technology is a major driver in strategy implementation and also in the control of strategy. Thus, technology remains one of the major determinants of organizational strategy and consequently, many organisations tend to develop their strategies along technology axis (Tassey, 2012).

Besides its role in the entire organisational strategy process, technology has also continued to improve organisational functions. For instance, technology impacts significantly on organisational marketing functions and in enhancing the competitiveness of organisations in the market place. As a catalyst for enhanced competitive profile for organisations. Thus, Cox (2016) argued that technology is used in creating new business models, developing new products and services, enhancing existing offerings and in creating deeper and more rewarding customer experiences in the market place.

In the light of its roles in the organisational strategy process and in the marketing function, technology impacts significantly on organisational product development. Product development is part of an organisation's intensive strategy designed to achieve product improvement and innovation (Johnson, Scholes & Whittington, 2008). It entails the development and selling of new products to existing customers in current markets. Product development aims at the growth of market through substantial modification of existing products or creation of new but related products that can be marketed to current customers through established channels. Technology

also enables organisations to develop products and services needed to provide strategic advantages in the competitive environment (Kihara, Bwisa, and Kihoro, 2016). Resultantly, as technology and the technology environment develop and change rapidly, the deployment of appropriate technology to achieve adequate product development and organisational growth becomes increasingly challenging.

In the banking industry, technology plays even more critical roles in the working of banking institutions and the services provided by them (Thyaga,2016).The impact of the developments and trends in technology have significantly affected the banking industry causing major changes (Campanella et al., 2017). Technology plays significant roles in the corporate strategy process and in the implementation of product development and other intensive strategies of banking organisations to enhance their potentials for growth (Piciu&Chitiga, 2011). According to Nikoloski (2014) technology is used in implementing a variety of competitive strategies ranging from lowering costs, differentiation of products and services, developing alliances, innovation and growth. Furthermore, technology is increasingly driving competition in the banking industry and has indeed also provided banking customers with wide range of choices in the way they access their banking services (Burani, 2012).

Consequently, banking organisations are compelled to adopt and use technology to sustain their competitive position in the market place as well as achieve growth and greater organisational performance. According to Abbey (2010), to be able to survive and grow in the changing market environment, banks are going for the latest technologies, which is being perceived as an enabling resource that can help in developing leaner and more flexible structure that can respond quickly to the dynamics of a fast-changing market scenario. Thus, as the banking industry market grows and becomes increasingly sophisticated due to technology, the need to devise technology-driven innovative product development strategies to achieve market growth and competitive advantage become imperative.

This study is relevant as it attempts to underscore the role technology plays in specifically enhancing the intensive strategy of product development as part of the strategy for achieving competitive advantage in the banking industry in Nigeria. This is a distinctive addition to the numerous studies done on the various roles of technology in organisational strategy and performance (Ringim et al., 2015; Durowoju, 2017; and Sibanda and Ramrathan, 2017). The research outcome of this study will provide further insight on the strategic importance and effectiveness of product development in achieving intensive growth strategies especially in a competitive economic environment like Nigerian banking industry. The significance of the banking industry in the Nigerian economy and the indispensable role of technology in the banking sector further justify the relevance of this study at this time.

II. LITERATURE REVIEW

2.1 Technology

Technology is a very broad term and concept with varied interpretations and meanings. It is indeed one of the key concepts in today's contemporary society even as its origin dates back to the early ages (Agar, 2020).Simply, technology can be regarded as the application of scientific knowledge to the practical aims of human life (Britannica, 2023). It can also be explained as the application of scientific knowledge for practical purposes. Technology is used to undertake various tasks, and can thus be seen as the products and processes used to simplify the performance of our tasks (Ramey,2019). In this regard, technology takes various forms in its application in the various areas of human endeavour including communication, transportation, education, health, business, manufacturing etc. Technology is the product of human knowledge which finds expression in the various tools and devices used for performing or completing specific tasks. Thus, technology comprises both theoretical knowledge and practical deployment of relevant devices as well as the methods, systems and processes needed to achieve the performance of a given task or objective.

Technology constitutes a major component of the external environment in which organisations including banking organisations operate. It exerts a lot of impact and causes and creates lots of changes and uncertainties in the business environment. The elements and inherent factors of the technology environment affect and influence organisations. These include computerization, mechanization, internet technology, information and communication technology, cryptography, 3D technology, mobile and telecom technology, artificial intelligence, robotics etc. These variables characterise the technology environment and create both opportunities and threats for organisations in several ways. In consideration of this reality, White and Brutton (2011) recommended that organisations should pay close attention to the new technological developments in their respective industries and incorporate them as part of their strategic plans to ensure their success.

In the light of the foregoing, the importance of technology to organisations cannot be over-stated. Being a strategic resource, Coombs and Bierly (2006) see technology as one of the most important resource elements of organisations in achieving sustainable competitive advantage over competitors. This is so because technology is a major tool in strategy implementation. In fact, technology has become a strong dynamic

capability that is embedded in organisational practices and is essential in determining the competitiveness and performance of organisations in a dynamic and turbulent environment (Zollo & Winter, 2002). In the views of Teece (2014), organisations need to develop resilient dynamic capabilities and robust technological responsiveness to create new technologies, differentiate and maintain superior processes and modify their structures and business models in order to survive and remain competitive.

Abbey (2010) observed that in the banking industry, technology gradually entered into banking operations in the beginning of the 1980s, when banking organisations started globalizing their operations and processes in a limited manner. After about a decade especially in the mid-1990s, the banking industry became revolutionised with globalization and the application of information technology leading to what can be referred to today as total banking automation. According to him, the middle and late 1990s witnessed the tornado of financial reforms, deregulation, globalization etc. coupled with rapid revolution in communication technologies and evolution of novel concept of convergence of communication technologies, like internet, mobile and cellular phones etc.

Presently, technology has continued to play greater roles in the working of banking industry and the services provided by them. Technology has provided altogether new ways of interacting and providing service to bank customers rather than merely replicating activities of the bank employees (Godse, 2005). These are evidenced in this new era of banking technologies and the regime of electronic banking that is being powered by technology. This present technological dispensation in the banking industry has resulted in the conduct of online real-time banking and the technology elements and innovation that have made transformational impact on banking operations, processes and services some of which are witnessed in the introduction of electronic banking, card technology, automated teller machines (ATMs), point of sales (PoS) terminals etc.

2.2 Technology and Product Development

Product development refers to the creation and delivery of new products and services for the existing and current markets of an organisation. It also includes the improvement of existing products for the present markets of an organisation. In line with this, Johnson, Scholes & Whittington (2008) described product development as an organisational strategy for new product creation and product improvement and innovation. It encompasses the entire process of offering new products and the development and improvement of existing products for the present market of an organisation. Kihara et al., (2016), maintain that technology assists organisations to develop products, services and capabilities to give organisations strategic advantages over competitors in the market place. Therefore, for product development to take place, new products must be developed, or improved upon by an organisation and sold to its customers in its current markets.

Im and Rai (2008) stressed the importance of product development strategies by organisations in order to survive in the competitive environment. Organisations pursue product development strategies in various ways. One of such ways is the introduction of entirely new products by an organisation to its present customers and markets. Another way product development can be pursued is by the creation and development of new products that are related to and associated with existing ones. Such related new products serve as add-ons and attachments that complement existing products. Finally, product development also involves the creation of different variants of an organisation's products. This can be achieved by developing additional models and sizes of existing product lines to suit the varied preference of the various customers. In other words, organisations can implement product development by introducing new products, developing new but related products and by creating different variants, models and new features of their products and services.

For product development to be successful, Johnson et al (2008) warned that the development of requisite strategic capability and mastering of the new technologies are imperative given the expensive and risky nature of product development. This underscores the role of technology in facilitating organisational product development and in the innovation of products and services for customers. To enhance product development, banks deploy technology to create and sell new products to organisation's existing customers in their current markets. Technology can be used to determine the needs and wants of customers in order to develop products that suit the market. For instance, banks use technology to create new product lines based on the needs and wants of customers of their existing customers. Banking organisations have used technology to create an avalanche of such banking products as internet banking, mobile banking, online banking etc. that allow customers to manage their accounts, make payments and conduct various banking transactions using various technological devices as computers, mobile smart phones, PoS machines and other devices. Essentially, the use of mobile technology to create banking products and render banking services remains one of the biggest product development initiatives in the Nigerian banking sector by not only offering value-added services to their customers but also in reaching the unbanked segments of the society.

In a further development, technology is used to create and sell new but related and associated products to organisation's existing customers in their current markets. The use of technology by banking organisations to develop related products and services enable them to keep up with the rapidly changing

tastes and demands of their customers. For instance, both mobile and internet banking technologies are used to create related products. The contactless payment systems such as near-field communication (NFC) and QR code scanners are new but related mobile banking products that allows customers to make payments using mobile devices or smartwatches.

Similarly, Technology is used by organisations to modify and repackage existing products as well as develop additional models of their products to suit the preferences of their various customers. Several existing banking products have been modified and repackaged by the use of technology. The introduction of cardless withdrawals to access cash from ATMs using mobile banking applications or mobile wallets without the use of cards is a typical technology-enabled modification and variant of existing ATM banking products. Furthermore, many banking organisations use technology to add new features to their existing products to make them more attractive and exciting especially to their various customer segments. The introduction of alerts and notifications to banking transactions are typical example of added features to banking products and services.

III. METHODOLOGY

This research design employed basic empirical approach to explore and find out the how banking organisations use technology to achieve the implementation of product development strategy in the Nigerian banking industry. This study gathered empirical data to ascertain and provide instances of the various ways banks deploy technology in introducing new banking products, developing new but related products and creating different variants, models and new features of their products and services.

Five major Nigerian banks were chosen and used as sample organisations in this study. This represents about 20% of the commercial banking organisations in Nigeria. The banks were judgmentally chosen because they rank amongst the leading and top-tier banking organisations in Nigeria with strong digital and technology banking culture. The banks include Access Bank; Fidelity Bank; First bank; Guaranty Trust Bank and Zenith Bank. Data generated from these major banks can be generalised and applied to the entire target market (Dixon-Ogbechie, 2002) and which in this case is the Nigerian banking industry.

This empirical study used both primary and secondary data. The primary data source consists of personal interviews. Personal interviews were conducted to gather first-hand and experiential information on how Nigerian banks deploy technology to achieve product development. At least two officers were interviewed in each of the five banks with one officer coming from information technology, electronic banking or related department. Secondary data for this study were sourced from the annual reports of the selected banks, academic and professional journals, journals and publications of the Central Bank of Nigeria (CBN), Nigeria Deposit Insurance Corporation (NDIC), Chartered Institute of Bankers of Nigeria (CIBN), research reports, seminar papers, text books, the internet and other relevant materials.

IV. PRESENTATION AND DISCUSSION OF FINDINGS

4.1 Technology and New Product Development

It is the finding of this study that technology facilitates product development in the banking industry. Specifically, this study finds out that banking organisations use technology to introduce entirely new products and services to its present customers and markets. The interviewees strongly confirm that their banks use technology to create new products. This is supported by some of the documentary evidences including the Annual Financial Statements which detail how technology is deployed by banks to enhance the creation of new technology-based products to grow their markets. Empirically, it is also observed that the e-products launched by Nigerian banking organisations marked a new era in the technology-driven product development strides. For instance, in 2006, Zenith Bank introduced four new e-products including Alert3, Automated Direct Payment System (ADPS), (Automated Payroll Systems and Service Payroll) and 1-Bank to launch its e-banking products. These products driven by technology enhanced the banking product development of the bank (Ovia, 2006). For Fidelity Bank, it leveraged technology in line with its digital retail strategy through innovative products, services and solutions to serve its customers. Some of the products include the newly upgraded Fidelity Online Banking; the USSD *770# Instant Banking; and Flashkey (Okonkwo, 2018). First Bank also leveraged on technology to create cellular banking products as part of its strategy to deepen financial inclusion in the Nigerian economy. Some of these products include the *894 USSD banking, its First-Mobile self-service phone banking, and the Direct Sales Executive (DSE) App which is an encrypted cellular application on phones to permit account opening for customers (Ezirim, 2020). Thus, all the banking organisations have continually been improving on their technology in order to improve its new products development and service offerings. These findings that banks use technologies to develop new banking products find support in the works of Thyaga (2016) that information technology provides creative support for new products development for banks. It is also supported by the works of Fong et al. (2014) that new product development plays important roles in organisations and in organisational overall performance.

4.2 Technology and Related Product Development

Furthermore, this study's findings also indicate that banks deploy technology to create and develop new products that are related to and associated with existing ones. This was confirmed by both interview sessions and documentary sources to the effect banking organisations use similar technologies to create many new but related banking products to provide added value to customers and achieve market growth. Empirical evidence can easily be found in the use of Unstructured Supplementary Service Data (USSD) technology to create instant banking products and services that are similar and related to internet and mobile banking products and services. This enables low-income customers who do not own a smartphone and internet data connection to undertake a wide variety of internet-related and mobile banking services as new account opening, funds transfers, checking of account balance, generating account statement etc. Ordinarily, these banking products are the usual product offerings of internet and mobile banking applications. This finding is in line with the position of Thanvi (2017) that through the prologue of information technology related products like online banking, mobile banking, automated teller machines (ATMs), fund transfers, automated clearing services etc., banks now can provide more related services to their increasing customers even with less manpower. The implication of this finding is that there are always cheaper technological alternatives that banks can exploit to deliver related products to their customers.

4.3 Technology and Variant Products Development

Finally, this study finds that banks utilize technology to create different variants of their banking products as part of their product development strategies. Banking organisations achieve this by developing and innovating additional models, sizes and features of their existing banking product lines to suit the varied preference of their various customers. This fact was established from the information and clarifications provided during the interview sessions as well as the evidences found in the documentary sources. Typically, banking organisations employ various technology to differentiate their products and services to make them distinctively attractive to their numerous customers. Empirically, there are lots of innovative product development initiatives by Nigerian banking organisations that have provided varieties and new features in existing banking products and services. For instance, First Bank of Nigeria has a digital laboratory that has the agility to swiftly develop and roll out innovative financial products and services (Ani-Mumuney, 2018). For Access Bank, technology has enabled innovative ways of using mobile technology to help Nigeria's largely unbanked population access financial services. These findings agree with the views of Gupta (2008) that information technology through electronic banking is changing the banking and financial sector in terms of the nature of core products or services and the way these are packaged, suggested, delivered and consumed, also support this finding. This implies that banks need to continuously invest in innovative technology to enable constant innovative product development.

V. SUMMARY AND RECOMMENDATION

The outcome and findings of this study confirm that technology impacts and enhances the strategy of product development in the Nigerian banking industry. Technology has greatly enabled Nigerian banks to implement and achieve product development strategies by introducing new products, developing new but related products and by creating different variants and features of existing products and services in their present markets. This implies that increased application of technology will lead to adequate development of products and services in the Nigerian banking industry.

In conclusion, this study deduces that technology is directly and positively related to improved product development in the Nigerian banking industry. Finally, this study recommends that banking organisations in Nigeria should continue to invest in technology to embark on adequate product development in order to achieve market growth and remain competitive.

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