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The interplay between digital onboarding and customer experience in the Nigerian banking industry: a post-COVID-19 analysis

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The contemporary financial environment has undergone substantial transformation, accelerated by the global COVID-19 pandemic, necessitating replacement of physical banking interactions with digital alternatives. This paper examines relationships between digital onboarding and customer experience in Nigeria's banking sector through a post-COVID-19 lens, investigating how e-banking registration, service integration, and bank notification services impact customer experience. Grounded in the Unified Theory of Acceptance and Use of Technology 2 (UTAUT2), the study employed descriptive survey methodology using structured questionnaires administered to 377 active customers across five major commercial banks (Zenith Bank, Access Bank, First Bank, GTBank, UBA) in Kwara State, Nigeria. Partial Least Squares Structural Equation Modeling (PLS-SEM) analyzed collected data. Results demonstrated that service integration exerted the greatest impact on customer experience ($\beta = 0.375$, $t = 11.341$, $p < 0.001$), followed by e-banking registration ($\beta = 0.340$, $t = 7.023$, $p < 0.001$) and bank notification services ($\beta = 0.245$, $t = 5.785$, $p < 0.001$). Collectively, these digital onboarding constructs explained 69.4% of customer experience variance ($R^2 = 0.694$), highlighting significant predictive power of digital onboarding as a multidimensional strategic resource. The study concludes that digital onboarding critically determines customer experience in Nigerian banking, functioning not merely as operational requirement but as strategic experience catalyst. Nigerian banks should prioritize enhancing digital onboarding through robust service integration infrastructure, simplified e-banking registration procedures, and accurate, timely, personalized notification systems.

Keywords: Digital Onboarding, Customer Experience, Banking Industry, Covid-19, E-Banking Registration, Service Integration, Bank Notification Services, Financial Technology, Digital Transformation, PLS-SEM, Nigeria, UTUAT 2.

Problem statement and analysis of recent research. The modern financial environment has experienced a significant revolution, which was hastened by worldwide health pandemics where physical contacts has to be replaced. The time has also marked the paramount relevance of a strong remote connection to financial services that has pushed institutions to reconsider their service delivery models (Nabi et al., 2025). The necessity to keep the business running and preserving the customer safety neared a radical shift in the digitalisation of the industry that changed the very principles of interaction (Badawy & Radovic, 2020). Such a change has placed the technological adoption as part of the not only convenient but also a foundation of the modern banking viability and competitiveness (Hidayat-ur-Rehman & Hossain, 2024).

In Nigeria, this trend in the world went through the intersection with the unique ecosystem with a huge and young population and fast-growing internet coverage. The enabling policies of Central Bank of Nigeria also ensured that the country was a good place to embrace digital financial solutions with the aim of promoting financial inclusion (Olusanya & Eucharia, 2024). The crossbreeding of regulatory enabling and demographic conditions and technological infrastructure formed an excellent background of revisiting how financial relationships are formed and maintained (Ali Mustafa, 2024). Therefore, the first impression of a bank and its prospective customers has become a kind of a focal point and the impressions, as well as loyalty in the long perspective, are formed in this new reality (Amnas et al., 2024).

It is a strategic focus point because the first point of contact of a customer with a financial institution determines the rest of the further relations with a bank or organization. An effective and smooth initial experience may have a important overall impression and satisfaction on the user, which develops a base of confidence and trust (Purwanto et al., 2020). Effectiveness and intuition of this initial interaction have become the most important factors in an environment where one can easily find an alternative at the fingertips of a customer (Sithipolvanichgul et al., 2021). Consequently, the study of this strategic point of interaction is of invaluable value in the dynamism of service quality and retention of customers in the contemporary age (Rodriguez-Torrico et al., 2020).

First registration process of e-banking is the most important first point of touch, yet it is usually plagued with usability problems that provide strong customer-experience obstacles. One of the main issues is that registration forms may be lengthy and complicated, thus requiring too much information about the user and potentially frustrating him or her, causing them to quit taking them (Gautam & Sah, 2023). Moreover, improper design of user interface and lack of instructions could disorient the customers, especially those with less digital fluency, and thus they will not be able to complete the process (Ayo et al., 2016). Such unpleasant experiences at the very beginning may have a disastrous effect on the perception of a customer towards the digital competence of the bank and prevent further interaction with the online services offered by the bank (Rupal & Singh, 2023). The overall impact of these registration obstacles is an immediate rise in the cost of acquiring our customers and a dead weight on the relationships that might eventually be long term with digital banking.

Although service integration aims at providing a smooth ecosystem, in many cases, it can lead to the lack of continuity in the customer experience in case of its poor implementation. A lack of an integrated platform means that customers frequently experience a disjointed experience of passing between various banking service types, e.g., a module of loan applications to a customer support chat (Kamboj et al., 2021). Such fragmentation causes the users to re-authenticate or re-enter the data, which is frictionary and creates a sense of inefficiency (Dagasaner & Karaatmaca, 2025). Frequently, the core problem can be seen in the legacy back-end systems that cannot be fully compatible with the current Application Programming Interfaces (APIs) and cause delays and errors in the data synchronization between services (Koritala, 2025). In its turn, this would not result in a smooth customer experience, as they would be greeted by a row of dissatisfying interactions that do not rebuild the convenience of digital banking verbalized and spoil the confidence in the technology affordability of the given institution.

Bank notification services are necessary in the context of interaction and security, and their improper administration might result in customer frustration and alert fatigue. Another major issue is that customers cannot do this with a granular level of notification preferences, which leads to receiving too many irrelevant notifications that get used to disregard, even when it has to do with a security issue (Shankar, 2022). Also problematic are the time and regularity of the such automated messages, as non-emergency messages are delivered at the wrong time and disruptive hours that customers consider

intrusive and disruptive (Eren, 2021). In addition, the absence of specificity and practical data in the text of messages may lead to confusion and anxiety instead of any kind of reassurance of information or useful prompts (Besmer et al., 2019). In the event when the notifications do not convey timely, relevant, and helpful information, they become a major touchpoint turning into one of the main irritants, which reduces the value of the service.

Digital onboarding thus, is a scientific and practical problem of immediate concern. Scientifically, although there is increasing literature on the adoption of digital banking in the world, empirical studies to break down the concept of digital onboarding into three dimensions: e-banking registration, service integration, and bank notification services and test related disaggregated dimensions as well as their combined effects on customer experience in the Nigerian post-COVID-19 environment are still lacking (Shastri and Khandelwal, 2024; Safdar et al., 2025). Practically, there is increasing pressure on Nigerian banks to provide smooth digital experiences with infrastructural limitations and varied digital literacy rates and the dynamic nature of regulatory demands (Olusanya and Eucharia, 2024). It is thus essential to fill this gap both to develop theoretical insights into digital service quality in new market economies as well as to inform industry professionals and policymakers on how to build onboarding models to drive customer satisfaction, financial inclusion, and institutional competitiveness.

The aim of the study. Specifically, the objectives of the study are to determine the effect of e-banking registration on customer experience, to investigate the influence of service integration on customer experience, and to examine the influence of bank notification services on customer experience.

Material and research methods. Digital on-boarding is a technological transformation of the existing customer registration, which formerly happened physically with paper, to an unrestricted online journey. It usually involves a set of digital identity verification (IDV) solutions, such as biometric verification, document verification, alongside data auto-population, to determine the identity of customers at a distance and in a safe way (Castelblanco et al., 2020). This is one of the changes indispensable to financial institutions and other regulatory organizations that need to enhance their ability to meet the requirements of Know Your Customer (KYC) and Anti-Money-Laundering (AML) with increased efficiency. The development of on-boarding moves forward with the new innovations in the field of artificial intelligence and machine learning, which allows detecting fraud and assessing risks in real-time, facilitating compliance procedures (Venkata Raja Ravi Kumar Gelle, 2025). Finally, digital on-boarding provides the key first point of interaction in customer lifecycle, predetermining the rest of the further interaction between the customer and the organization (Herhausen et al., 2020).

Digital on-boarding is not just an automation concept, and its focus is to make an integrated and unified experience that will cause less friction to legitimate customers. It is a strategic undertaking that involves the use of Application Programming Interfaces (APIs) to interlink the verification services and data sources used differently into one flowing process. The integration promotes a more dynamic and responsive system of enrolling the company, the ability of which to adjust to the risk profile of customers and regulatory needs of different jurisdictions (Shastri & Khandelwal, 2024). The first challenge to overcome is being able to digitize the initial hurdle thus enabling businesses to reduce abandonment rates significantly and make more gains in an ever more digital economy. The overall idea is to make the required compliance processes virtually transparent to the user and thus make regulatory necessities a competitive value (Kumar et al., 2024).

Customer experience (CX) is considered a holistic construct, which is an overall summation of cognitive, emotional, sensorial, and behavioral facets of customer responses in all the phases of his interaction with a brand or service. It is no longer limited to a particular transaction but a collection of perceptions developed due to a number of touchpoints, prior and after sale (Lemon & Verhoef, 2016). Positive CX is defined as smooth interactions, emotional involvement, and getting the value in a balanced way, which all bring customer loyalty and satisfaction in the long run. In the digital age, CX is becoming more influenced by digital interface quality, speed of the service delivery, and customization of the interaction, thus becoming the major differentiator in competitive markets (Homburg, Jozic & Kuehnl, 2017). In this regard, CX strategic management is essential to maintain the competitive edge and spur the business development.

The idea of customer experience focuses on its subjective and context specific nature, in which the interior condition of the customer and the exterior environment interplay to create the perception in general. It is a multidimensional phenomenon comprising of functional (easy, convenient),

mechanical (easy to use, design) and humanic (empathy, emotional attachment) indicators (Berry, Wall & Carbone, 2006). The modern CX frameworks have realised the need to develop consistent and positive encounter through all the mediums, both physical and digital, to address the increasing demands of swiftness and topicality by the customer. An excellent CX directly impacts the most critical business indicators by raising customer lifetime value and lowering churn rates because customers who had positive experience deal with the company would become brand ambassadors (Kumar & Pansari, 2019). CX is the basis of achieving long-lasting relationships with a customer in a service-dominant logic.

On its part, digital on-boarding has an immense and direct impact on customer experience, being the experience that creates the platform of initial impressions and credibility on customers. The simplicity, ease, and speed with which a user goes through the on-boarding process, the primary goals of which are the factors of cognitive overload and early frustration, directly decrease cognitive load and the intention to adopt the product (Petrilli et al., 2022). Streamlined process of digital identity verification is an indicator of the technological proficiency and security which in turn, increases the perceived elements of reliability of the service provider initially. On the other hand, when the on-boarding experience is a pain or a breakdown, immediate dropout and unending negative brand perceptions may arise because the first obstacle will already become insurmountable (Komandla, 2018). Thus, effectiveness and ease of use of the digital on-boarding process are directly related to the level of user satisfaction as a starting point of the service relationship and their readiness to continue with the relationship (Aamer & Milani, 2023).

Digital elements of customer experience (NoC) on boarding are long term as they create a source of expectation on the handling of future interactions, as well as an ability of personalization of delivery of services. An effective on-boarding strategy that gathers and authenticates the information about customers sets the stage of an even more personalized and more relevant customer experience further, cultivating a feeling of being known and appreciated (Sani et al., 2022). This favorable first impression has the potential to trigger a virtuous cycle where the level of initial satisfaction will influence the likelihood of further interactions and loyalty of the customer directly affecting the customer lifetime value. The information created in the course of the on-boarding enables the latter to gather valuable data, and organisations can use it to predict the needs and offer a proactive service to their clients, thus improving the entire experience (Grewal et al., 2021). The point is that successful digital on-boarding process is not only a business operation but a business investment in the development of the positive and long-term customer experience trend.

E-banking registration process is the most important first contact in the online banking relationship experience with an extensive impact on the customer future experience and view of the organization. An easy, convenient, fast registration process creates a welcoming impression of the bank, small and medium enhance the attitudes to its technological capabilities and customer focus, which ultimately promotes greater use of the online channel. On the other hand, the compliance of a cumbersome procedure reeking with friction like complicated passwords, multiple data capital, or malfunction can instantly destroy belief and fulfilment and could result in its graveyard and adverse word-of-mouth advertising. A study conducted by Zhang et al. (2021) is affirmative that simplicity and the perception of being secure upon initial sign-up is the most significant factor in assessing further use. Digital onboarding is not a simple process but a building block of the whole customer experience as it determines future loyalty and the activity of the customer. The latter is justified by the results that a favorable first experience with the digital platforms will contribute immensely to the lifetime value of the customer and the decreased chances of churn (Daradkeh et al., 2023). Thus, it can be concluded that the e-banking registration process optimization is a strategic need of banks that want to gain a competitive advantage in the digital environment as it directly influences the cognitive and affective level of the customer, determining his or her general experience in the digital realm (Romagia et al., 2025). Thus, we propose the first hypothesis as follows:

H1: *E-banking registration has a positive influence on customer experience*

Effect of Service Integration on Customer Experience. Service integration, an integration of different channels of the bank, and third-party services in the seamless ecosystem is transformatively influencing customer experience by making it essentially more convenient and less frictional. Having a mobile app that allows customers to make a transaction and adjust it on a chatbot and request further clarification as a video link with a teller without repeating information provided is what has developed a smooth and efficient experience that redeems

current expectations of omnichannel service. This combined strategy does not separate departments and channels as before which would present the customer relationship as a single, holistic view which can be used to provide more personalised and proactive service. Ayinaddis et al. (2023) established that service integration is another factor that determines the perceived quality of service and customer satisfaction in digital banking. The integrated services that result in a synergy on the part of the customer only enhance easier complex financial management and the branding of reliability and sophistication regarding the banking brand. According to the reports of customers of banks with highly integrated systems, levels of effort are lower, and emotional connection is high, which are defining factors of loyalty (Kumar & Reinartz, 2018). Successful service integration transforms the customer experience of a first and second, third, etc transaction to a cyclic, contextual and fulfiling treatise that entrenches the bank as a seamless financially.

Thus, we propose the second hypothesis as follows:

H2: *Service integration has a positive influence on customer experience*

Effect of Bank Notification Services on Customer Experience. Bank notification services (including real-time notifications about the transactions, balance limits, and security warnings) have an effective impact on the customer experience as they help to generate the feeling of control and security and interaction. These more proactive communications are observed to keep the customers updated and engaged in their financial life, and do not demand active account logging in by the customer, which is lowering the cognitive load and making them more financially mindful. The real-time notification about transactions that push users receive through notifications or SMS alerts is a highly important security aspect, since it enables clients to promptly identify any fraudulent activity and report it, which contributes to a significant degree of enhanced customer satisfaction and confidence in the bank (Mohammed Amin Almaiah et al., 2023). In addition, timely updates are found to be helpful not only in terms of security but also assist customers in preventing overdraft costs and be better budgeters, which has a direct impact on a financial well-being. According to empirical studies, perceived usefulness and relevance of such notifications are the most important predictors of customer satisfaction and the use of digital banking platforms in the future (Talwar et al., 2020). The notification services transform the customer into an account holder who is not only active, as a customer, but an active informed manager of his/her finances, as they deliver the appropriate, relevant and useful information in time, thus establishing a stronger relationship with the bank. This non-contact connection makes the bank an influential and useful part of the everyday life of the customer and guarantees enhancement of positive experiences and generation of lasting loyalty (Wang & Huang, 2023).

Thus, we propose the third hypothesis as follows:

H3: *Bank notification services has a positive influence on customer experience*

Theoretical Framework: The Unified Theory of Acceptance and Use of Technology 2 (UTAUT2). The Unified Theory of Acceptance and Use of Technology 2 (UTAUT2), proposed by Venkatesh Thong and Xu. (2012), provides appropriate theoretical grounding for consumer technology adoption analysis. UTAUT2 posits that performance expectancy, effort expectancy, social influence, facilitating conditions, hedonic motivation, price value, and habit influence behavioral intentions and technology use, with relationships moderated by age, gender, and experience. While empirical validation in post-COVID-19 Nigerian digital banking remains limited, and criticisms identify trust and perceived risk omissions (Tamilmani et al., 2021), the model effectively examines digital onboarding-customer experience relationships since ease of use, usefulness, and enjoyment perceptions strongly influence satisfaction, repeat use, and retention (Tandon, Kiran, and Sah, 2016; Apaua & Lallie, 2022). Combining behavioral and contextual determinants, UTAUT2 offers a versatile analytical framework for evaluating digital onboarding's influence on Nigerian banking customer experience.

Empirical Review. The study by Safdar et al. (2025) has been conducted recently and is titled Does customer experience and digital competency matter online brand advocacy with mediation? A TAM extension study, examined the influence of customer experience and online digital competency with regard to online brand advocacy of Foodpanda apps users. The scholars have used a quantitative methodology as primary data has been used in the form of 273 structured questionnaires. Every research was performed within the framework of online delivery of food, although no specific country is mentioned. Results showed customer experience and digital competency have a significant effect on online brand advocacy, in which customer values and

brand reputation of such a brand act as mediators. The experiment realized that the improvement of the digital onboarding and customer experience will enable developing parent brand advocacy among the users of the digital platform.

The other empirical study, impact of Digital On-Boarding Quality on Customer Satisfaction: The Moderating Role of Perceived Risk conducted by Shastri and Khandelwal (2024) was carried out in the Indian banking industry. The quantitative method was the one applied in this study and the primary data was the 1,019 respondents answering a survey questionnaire. Analysis of data was done using SMARTPLS 4 software. The findings showed that the quality of digital onboarding has a positive impact on customer satisfaction and experience, and perceived risk mediate the relationships. The authors came to a conclusion that the enhancement of customer satisfaction depends on the improvement of digital onboarding processes; however, the perceived risks need to be tackled to achieve as many positive results as possible.

The third study by Rahman et al. (2023), titled The new wave of AI -based luxury brands online shopping experience: The role of digital multisensory cues and customers engagement, used multi -method research design in the framework of luxury brand online shopping. The study was done in some of the institutions such as North South University and University of Johannesburg. The research design was a semi-structured interview and survey (semi-structured, qualitative and quantitative, respectively; primary data) form of research, which was analysed using PLS-SEM and fsQCA. The researchers established that AI-enabled digital assistance provides better customer engagement, which is an intermediary between digital onboarding and customer experience. It was also discovered that additional relationship was moderated by digital multisensory cues. The authors concluded that in the luxury e-commerce, customer experience can be greatly enhanced with the inclusion of sophisticated digital onboarding experience.

Gaps in Existing Literature. Though the available literature has contributed to the research of digital onboarding and consumer experience, there are still a number of critical gaps. Safdar et al. (2025) and Rahman et al. (2023) evaluated the concept of digital experience and brand advocacy but addressed the conditions of food delivery and luxury e-commerce respectively, which does not mean that they are applicable to the banking industry in Sub-Saharan Africa. The article by Shastri and Khandelwal (2024) is a good study of the quality of the digital onboarding process in the Indian banking sector, but the situation in the Nigerian banking and regulation context remained uninvestigated. In their study, Ayinaddis et al. (2023) did not identify the quality of electronic banking services and customer satisfaction as a multidimensional construct when concentrating on the digital onboarding aspect. On the same note, Ayo et al. (2016) and Gautam and Sah (2023) also covered the e-banking usability but have failed to identify service integration and notification services as separate dimensions of onboarding. Almaiah et al. (2023) and Talwar et al. (2020) examined the mobile banking confidence and customer resistance but failed to empirically test the combination of onboarding constructs on customer experience through PLS-SEM in an African market. Petrilli et al. (2022) studied the subject of digital onboarding in workplace contexts and not in the banking setting. Besides, Rodriguez-Torrico et al. (2020) and Kamboj et al. (2021) briefly mentioned omnichannel experience and mobile banking failure, respectively, but not in a systematic manner and the digital Nigeria transformation of post-COVID-19 onboarding. Their combined incompleteness, namely, in the context, decomposition of constructs, and the approach to understanding service delivery, demonstrates that the current study is warranted as it will examine the disaggregated impact of e-banking registration, service integration, and the bank notification services on customer experience in commercial banks in Nigeria uniquely in the post-COVID-19 era in a validated PLS-SEM framework.

Methodology. The study employed a descriptive design and employ the survey methodology. This is due to the fact that the goal of descriptive research is to accurately depict a person, event, or circumstance. Since it contributes to the explanation of present practices related to the topic issue, descriptive research design is deemed suitable to examine the impacts of digital on-boarding on customer experience within Nigeria's banking industry. The study focuses on five major commercial banks in Nigeria Zenith Bank, Access Bank, First Bank, GTBank, and UBA due to their e-banking registration, high levels of service integration, and early integration of digital onboarding in bank notification services. These banks represent a balanced mix of innovation leadership, customer interaction points, and nationwide presence, making them suitable proxies for assessing digital on-boarding role in enhancing customer experience.

Population of interest are principal branches' active customers of the above five banks in Kwara State, and their estimated customer base is 20,000

in principal branches in Ilorin, Offa, and Omu-Aran. 377 respondents sample size was adopted using Taro Yamane's (1967) formula when utilizing known population with less than 5% margin error to provide statistical representation and generalizability of results. The study adhered to established ethical standards including informed consent from all participants, voluntary participation with no coercion, confidentiality and anonymity of respondents' data, and approval from relevant institutional review boards to ensure ethical compliance throughout the data collection process.

Participants were identified using purposive-proportional sampling, where there was equal representation in the chosen banks relative to customer population size and digital service usage. A structured questionnaire was used to gather replies from the respondents which served as the primary source of data. The questionnaire had four major sections. The first one covered three structure items on e-banking registration, second sections had three items on service integration, third sections covered two structured items on bank notification services, while the fourth sections covered three structure items on customer experience. Five-point Likert scale was adopted as the scale of measurement for the questionnaire. The instrument was validated through face and content validity which was done by some lecturers and professors in the field of business administration and management while the reliability of the study was assess through Cronbach alpha and Composite Reliability (CR) using SmartPLS version 3.2.9, with thresholds of 0.7 and above. For analytical purposes, descriptive statistics (mean and standard deviation) and inferential statistics were employed, with the utilization of Partial Least Squares Structural Equation Modeling (PLS-SEM) in the study of the structural relationship between artificial intelligence deployment and customer satisfaction among the sample banks. PLS-SEM was selected over covariance-based SEM for five reasons: firstly, predictive focus on variance maximization rather than theory confirmation (Sarstedt et al., 2017), secondly, accommodation of formative constructs where indicators cause the construct (Hair et al., 2019), thirdly, robustness with non-normal data distributions (Hair et al., 2017), fourthly, efficiency with moderate sample sizes (Chin & Newsted, 1999), and fifthly, suitability for exploratory theory development in under-researched African contexts (Richter et al., 2016). Sample size (n=321) exceeds the minimum PLS-SEM requirement of 10 observations per predictor (30 minimum for three predictors), ensuring adequate statistical power for detecting medium effects ($f^2 \geq 0.15$) at 80% power and $\alpha = 0.05$ (Cohen, 1988).

Research results and discussion. In this research report, digital onboarding is the independent variable and customers' experience is the dependent variable. The following model will be utilized since the report will make use of structural equation modeling (SEM):

Econometric Model:

IC= f (E-Banking Registration [CI+ PDP +UF] +
+ Service Integration [SS+ SA + SD] +
+ Bank Notification Services [NA+ RN+TN]) (1)

Where:

CE= Customers' Experience
CI = Clear Instructions
PDP = Personal Data-Protects
UF = User Friendly
SS = Seamless Services
SA= Service Access
SD= Service Delays
NA = Notification Accuracy
RN = Relevant Notifiactions
TN = Timely Notifiactions

Response Rate. The data needed for this investigation was gathered using a questionnaire. A total of 321 responses have been captured, which is 85.14% of the expected sample size. To meet the expected sample size, fifteen replies are required. Thus, the actual responses make up the data used in this study.

Table 1 presents the descriptive statistics and the results of the normality tests for the variables under study.

Table 1 presents the descriptive statistics and normality test results for variables related to digital onboarding and customer experience. The mean values range from 2.607 to 3.402, with «Clear Instructions» showing the highest mean (3.402), indicating that respondents generally find instructions clear and helpful, a key aspect of digital onboarding. The lowest means, Service Delays 2 (2.607), points to delays being a notable customer pain point. Standard deviations are all below 1.2, signifying moderate variability in responses. Skewness values near zero indicate a balanced distribution; however, the value for 'Notification Accuracy' (-0.311) suggests a slight negative skew. Kurtosis values, mostly negative, confirm data distributions are relatively flat without significant outliers. These results indicate that while many aspects of digital onboarding enhance customer experience, inefficiencies like service delays need to be addressed. The findings imply that digital onboarding can significantly improve customer experience if optimized.

Table 1 – **Descriptive Analysis and Normality Test**

	Mean	Standard Deviation	Excess Kurtosis	Skewness	Number of Observations Used
Clear Instructions	3.402	1.043	-0.697	-0.002	321.000
Network Signal Quality	3.221	0.909	-0.778	0.248	321.000
Notification Accuracy	3.196	0.942	-0.485	-0.311	321.000
Personal Data Protects	3.262	0.995	-0.556	-0.239	321.000
Relevant Notifications	2.810	1.073	-0.849	-0.041	321.000
Seamless Services	2.782	1.036	-0.678	0.025	321.000
Service Access	2.835	1.187	-1.055	-0.037	321.000
Service Delays	2.607	1.045	-0.754	0.099	321.000
Service Variety	3.121	1.077	-0.862	-0.003	321.000
Timely Notifications	3.006	1.082	-0.687	-0.324	321.000
Transaction Processing Efficiency	3.280	1.169	-0.831	-0.290	321.000
User-Friendly	2.888	0.973	-0.092	0.145	321.000

Source: SmartPLS Output, 2025.

The structural relationships between the core dimensions of digital onboarding and customer experience are visually represented in the path model shown in figure 1.

Figure 1 shows the structural model which illustrates the significant impact of digital onboarding on customers' experience in the Nigerian banking industry, as assessed through Zenith Bank. The model explains 69.4% of the variance in customers' experience ($R^2 = 0.694$), showcasing that digital onboarding contributes substantially to this construct. E-Banking Registration plays a notable role ($\beta = 0.340$), with high factor loadings on components such as clear instructions (0.840), personal data protection (0.843), and user-friendliness (0.775), indicating that a seamless registration process directly enhances customer experience. Service Integration contributes the most ($\beta = 0.375$), reflecting the critical importance of seamless services (0.888), effective service access (0.874), and reduced service delays (0.856) in shaping a positive experience. Bank Notification Services have a smaller but significant impact ($\beta = 0.245$), emphasizing the role of timely (0.757), relevant (0.842), and accurate (0.835) notifications in ensuring customer satisfaction. The dimensions of customers' experience—network signal quality (0.797), service variety (0.887), and transaction processing efficiency (0.835)—are strongly influenced by these digital onboarding practices, highlighting the critical role of efficient, accessible, and timely digital services in improving the banking experience. The implications suggest that digital onboarding practices, especially robust service integration and secure registration systems, are pivotal in enhancing customer experiences, driving satisfaction, and improving organizational performance in the Nigerian banking industry. Table 2 presents the construct reliability and validity metrics, confirming the quality of the measurement model.

Table 2 evaluates the reliability and validity of constructs related to digital onboarding. Cronbach's Alpha values range from 0.741 to 0.844, above the minimum threshold of 0.7, confirming internal consistency. Composite reliability values (0.853 to 0.906) exceed 0.7, further supporting the constructs' reliability. Average Variance Extracted (AVE) values are above 0.5 (0.660 to 0.762), indicating sufficient convergent validity. These results demonstrate that constructs such as «Bank Notification Services», «E-Banking Registration», «Service Integration», and «Customers' Experience» effectively measure the variables of interest. The robust reliability and validity of these constructs confirm their relevance in assessing how digital onboarding impacts customer experience. The discriminant validity of the model, evaluated via the Fornell-Larcker criterion, is detailed in table 3.

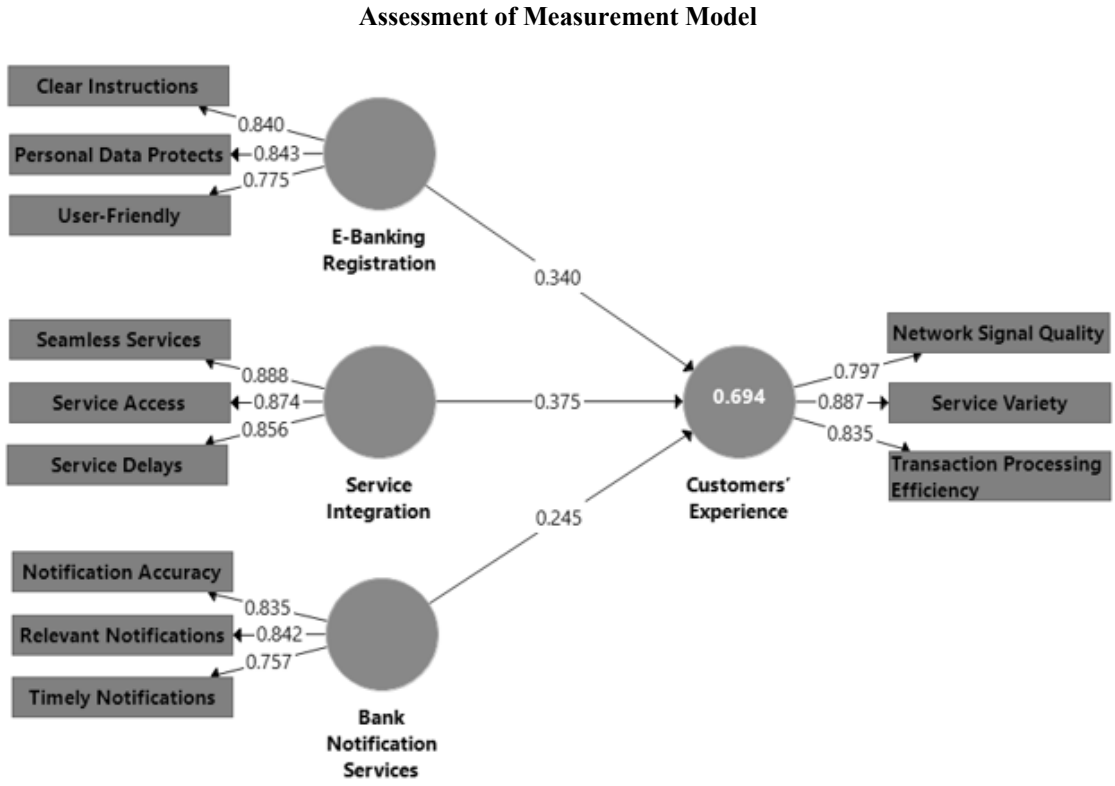

Figure 1. **A path model of Digital Onboarding and Customers' Experience**

Source: SmartPLS Output, 2025.

Note: All path coefficients are statistically significant at $p < 0.001$. Factor loadings are shown on indicator arrows. $R^2 = 0.694$.

Table 2 – **Construct Reliability and Validity**

	Cronbach's Alpha	**Composite Reliability**	**Average Variance Extracted (AVE)**
Bank Notification Services	0.741	0.853	0.660
Customers' Experience	0.792	0.878	0.706
E-Banking Registration	0.756	0.860	0.673
Service Integration	0.844	0.906	0.762

Source: SmartPLS Output, 2025.

Table 3 – **Discriminant Validity**

	Bank Notification Services	**Customers' Experience**	**E-Banking Registration**	**Service Integration**
Bank Notification Services	0.812			
Customers' Experience	0.694	0.840		
E-Banking Registration	0.693	0.741	0.820	
Service Integration	0.569	0.724	0.616	0.873

Source: SmartPLS Output, 2025.

Table 3 assesses discriminant validity by comparing correlations between constructs. Each construct's square root of AVE (on the diagonal) exceeds its correlation with other constructs. For example, «Service Integration» (0.873) shows a higher self-correlation than its correlation with «Customers' Experience» (0.724) or «E-Banking Registration» (0.616). This indicates that the constructs are distinct and non-overlapping. These results confirm that the digital onboarding aspects are unique and independently influence customer experience. This differentiation validates that digital onboarding elements can be independently optimized to enhance the overall customer experience.

Multicollinearity was assessed to ensure that the independent variables are not highly correlated, which would otherwise distort the results. To evaluate the potential correlation between these variables, the Variance Inflation Factor (VIF) was calculated for this study. Table 4 presents the Inner VIF values, which confirm that the independent constructs are sufficiently distinct, as all values fall within the acceptable threshold.

Table 4 – **Inner VIF Values**

	Bank Notification Services	**Customers' Experience**	**E-Banking Registration**	**Service Integration**
Bank Notification Services		2.053		
Customers' Experience				
E-Banking Registration		2.238		
Service Integration		1.719		

Source: SmartPLS Output, 2025.

Table 5 – **Bootstrapping Results Showing Path Coefficient for Structural Model**

	Original Sample (O)	**Sample Mean (M)**	**Standard Deviation (STDEV)**	**T Statistics (|O/STDEV|)**	**P Values**
Bank Notification Services -> Customers' Experience	0.245	0.246	0.042	5.785	**0.001**
E-Banking Registration -> Customers' Experience	0.340	0.337	0.048	7.023	**0.001**
Service Integration -> Customers' Experience	0.375	0.379	0.033	11.341	**0.001**

Source: SmartPLS Output, 2025.

Table 4 evaluates multicollinearity among independent variables using Variance Inflation Factor (VIF). Values for «Bank Notification Services» (2.053), «E-Banking Registration» (2.238), and «Service Integration» (1.719) are all below the threshold of 5, indicating no significant multicollinearity. This ensures that each independent variable uniquely contributes to the model. The lack of multicollinearity implies that the constructs of digital onboarding function independently in influencing customer experience, which affirms the model's robustness. Having established the measurement quality, the next step involves evaluating the structural relationships between the constructs. Table 5 presents the bootstrapping results, including path coefficients (β), T-statistics, and P-values, which serve to test the hypothesized impacts of digital onboarding components on customer experience.

Table 5 demonstrates the effects of digital onboarding constructs on customer experience. «Service Integration» (β = 0.375, t = 11.341, p = 0.001) shows the strongest and most significant impact, reflecting its critical role in improving seamless service delivery. «E-Banking Registration» (β=0.340, t = 7.023, p = 0.001) also significantly enhances customer experience by simplifying account setup processes. «Bank Notification Services» (β=0.245, t = 5.785, p = 0.001) significantly contributes to customer engagement and satisfaction. The p-values confirm that all relationships are statistically significant. These findings lead to the rejection of the null hypothesis, demonstrating that digital onboarding significantly impacts

customer experience. The results underscore the importance of comprehensive integration, accurate notifications, and user-friendly registration processes in achieving superior customer experiences. Beyond the significance of individual paths, it is essential to assess the model's predictive accuracy. Table 6 presents the Coefficient of Determination (R^2) scores, which indicate the proportion of variance in customer experience that is explained by the digital onboarding constructs.

Table 6 – **Coefficient of Determination Score**

	R Square	R Square Adjusted
Customers' Experience	0.694	0.691

Source: SmartPLS Output, 2025.

Table 6 reports an R-Square value of 0.694, indicating that 69.4% of the variability in customer experience is explained by digital onboarding constructs. The Adjusted R-Square (0.691) confirms the model's high explanatory power. These values highlight the substantial influence of digital onboarding on customer experience, emphasizing its strategic importance for achieving customer satisfaction goals. This showcase the profound impact of digital onboarding on enhancing customer interactions.

This showcases the profound impact of digital onboarding on enhancing customer interactions. To determine the relative importance of each independent variable, the effect size was calculated. Table 7 presents the assessment of the effect size (f^2), illustrating the substantive impact of «Bank Notification Services», «E-Banking Registration», and «Service Integration» on customer experience.

Table 7 assesses the effect size (f^2) of digital onboarding constructs. «Service Integration» (0.267) exhibits the largest effect, reflecting its pivotal role in transforming customer experiences. «E-Banking Registration» (0.169) and «Bank Notification Services» (0.095) show moderate and small effects, respectively, indicating their supporting roles. These findings suggest prioritizing service integration efforts while maintaining effective registration and notification services. This identifies critical areas of digital onboarding that drive customer satisfaction.

The results of the analysis of the first goal show that the goal of registering e-banking has a statistically significant and practically significant impact on the customer experience, and the simplified digital registration procedures are the key components of the positive interaction between the users. The high impact that this construct has on the overall explained power ($R^2 = 0.694$) provides the prominence of this construct in defining perception of convenience, accessibility, and efficiency by customers. It is not an isolated discovery because Safdar et al. (2025) revealed that an effective onboarding interface leads to a positive customer experience and creates digital advocacy, and Shastri and Khandelwal (2024) found that a good set of onboarding processes would considerably improve customer satisfaction in the Indian banking industry. Esseminately, Rahman et al. (2023) noted that interactive and explicit onboarding processes in AI-enabled setting enhance customer interaction on the platform. To sum up, the findings of the paper prove that e-banking registration is not merely an administrative matter but a strategic experience precursor, which promotes digital satisfaction, and thus validates Hypothesis One (H_1).

Table 7 – **Assessment of the Effect Size (f^2)**

	Bank Notification Services	Customers' Experience	E-Banking Registration	Service Integration
Bank Notification Services		0.095		
Customers' Experience				
E-Banking Registration		0.169		
Service Integration		0.267		

Source: SmartPLS Output, 2025.

The results concerning the second aim also show that the most effective digital onboarding construct that predicts customer experience is service integration that should focus on uninterrupted coordination of banking platforms and services. This dimension plays an essential role in the explanatory capability of this model, as the $R^2 = 0.694$ value demonstrates the fact that customers are placing an increasing importance on the digitized incorporation of seamless customer dealings, notices and functions which function in tandem. These findings support empirical findings of Safdar et al. (2025), who stated that the strong integration leads to better customer experience and online interaction, Shastri and Khandelwal (2024), who mentioned that reducing fragmentation of the processes directly increases the level of satisfaction. Also, Rahman et al. (2023) affirmed that digital systems and AI-based cues facilitate improved emotional and cognitive involvement of systems in online service settings. What was proved is that service integration as a key experiential process enhances trust, friction and amplifies user satisfaction as a form of support to Hypothesis Two (H_2).

The results of the analysis of the third goal show that the bank notification services can positively affect customer experience, and the consideration is significant, which proves that prompt, effective, and correct communications increase customer trust, interest, and perceptions of responsiveness in the service. The statistical significance of the construct also plays the beneficial role towards the high explanatory power of the model ($R^2= 0.694$), which shows that customers view real-time updates as a critical component of the digital service quality. Such results are consistent with the findings about effective notification systems help establish trust and real-time interaction (Talwar et al., 2020) and with the study by Shastri and Khadkelwal (2024), who claimed that digital communication is a part of the need to build onboarding satisfaction. Responsive digital interactions were also identified by Safdar et al. (2025) as one of the key elements of establishing positive experiential results. A combination of the results confirms that notification services are psychological assurance services which increase user confidence and positive engagement patterns which reinforce each other and thus supports Hypothesis 3 (H_3).

In general, the three constructs, which are e-banking registration, service integration, and bank notification services, jointly provide 69.4% of the variance in customer experience, pointing to the strong predictive ability and demonstrating provision of digital onboarding as a multidimensional strategic resource in the banking sector of Nigeria. The large value of the R square value refers to the overall relevance of the onboarding processes to the development of the cognitive and emotional aspects of the customer experience. Such findings not only confirm the current body of empirical literature but also expand the insights on digital onboarding and prove it to be exceptionally powerful in determining customer satisfaction in a developing financial landscape. The combined implication is that efficient digital onboarding is not limited to operational need, but an extremely potent experience trigger, and can lead to the improvement of service perception, customer-relation, and organizational competitiveness.

This study makes four distinct contributions: First systematic decomposition of digital onboarding into three empirically validated dimensions (e-banking registration, service integration, bank notification services) within African banking contexts, revealing differential effect magnitudes enabling precise intervention targeting. Also, the combined model explains over two-third of customer experience variance, substantially exceeding variance explained in comparable studies: Shastri and Khandelwal (2024) reported slightly over half mark of hundred in Indian banking while Rahman et al. (2023) achieved a bit more in luxury e-commerce. This suggests digital onboarding exerts relatively stronger influence in emerging African markets where infrastructure disparities amplify seamless digital process impacts.

Furthermore, analysis in Nigeria's post-COVID-19 environment (2024-2025 data) reveals that service integration exceeds e-banking registration contrasting pre-pandemic patterns where registration simplicity dominated (Ayo et al., 2016; Gautam & Sah, 2023). This shift suggests pandemic-induced digital adoption created customer expectations emphasizing ecosystem coherence over entry simplicity. The study also contributes be demonstrating that technology acceptance constructs manifest distinctly across digital onboarding sub-dimensions. Service integration reflects performance expectancy, e-banking registration embodies effort expectancy, while bank notification represents facilitating conditions. Differential effect sizes (f^2) of service integration, e-banking registration, bank notification all empirically validate UTAUT2's proposition that performance expectancy exerts stronger influence than effort expectancy and facilitating conditions.

Conclusion. This paper offers convincing empirical results that digital onboarding has a positive and statistically significant customer experience impact in the Nigerian banks. The findings indicate that the digital onboarding ingredients service integration, e-banking registration, and bank notification are interconnected mechanisms that increase the quality, fluidity and reliability of the customer interactions. Service integration has become a defining element of the structure which now guarantees that customers experience a consistent and smooth service environment where processes, platforms, and touchpoints are integrated. This integration efficiency is able to reduce operational friction, enhance the pace of transactions as well as strengthened the perception of institutional competence among customers.

In the same vein, the findings prove that the registration of e-banking does not just act as a technical requirement rather, it is a facilitating access point to democratize the banking services. Banks simplify enrolment procedures and minimise traditional barriers of entry to create user-friendly digital channels which make accessibility increased with expansion of overall engagement. Bank communications were also cited as one of the strategic communication tools, which maintains real-time communication, builds transparency, and engages customers more in financial activities, thus increasing trust and customer satisfaction with the services.

Combined, these constructs disclose that digital onboarding cannot be regarded as an additional innovation, in the form of service, but as a strong determinant of customer experience in modern banking settings. It does not just make customers cognitively, emotionally and behaviorally responsive to service encounters, but also may do so beyond the convenience of the transactions. The merge of non-interrupted integration, easy access, and ongoing communication fact states that the strategic investment banks in digital onboarding develop an increased level of customer satisfaction, competitive advantage, and relational value in the long term. Finally, this research highlights that digital onboarding is a key contributor to the banking excellence of the modern world, and a long-term avenue of achievements of the Nigerian banks aiming at achieving stronger customer experience in the further digitalized financial environment.

In accordance with the results of the conducted research, the following recommendations can be made:

As part of the strategy to enhance the customer experience, it is prudent that the banks in Nigeria focus strategically on the improvement of digital onboarding by ensured seamless integration of services. This necessitates the implementation of end-to-end digital processes that are supported by AI-inspired operations that ease the process of accounts set-up, minimize process delays and increase efficiency of service delivery. The training of the staff to be able to effectively cope with and maintain these AI-enabled systems is as well crucial to get the smooth operations and the constant communication with the customers.

To further enhance the adoption of e-banking, there is need to redesign registration interfaces into more user-friendly format, reachable to more customers and further responsive to various segments of customers, including those who have never had any experience with digital technology. Prompts, simplified authentication procedures, and multilinguistic support are features that can contribute a lot to usability and help increase its adoption. Also, the notification systems should be optimized to guarantee high accuracy, timeliness, and personalization because these factors are central in preserving the user following the service, as well as ensuring consumer interest throughout the service process.

These implementations need to start with urban and digitally active areas, in which the early cases can be taken and adjusted. The information presented through customer reviews, usage statistics, and customer satisfaction indicators must then be used to implement a gradual nationwide advertisement. Arguably, constant adaptation to customer requirements and expectations by the technological improvements can help the banks create the next level of satisfaction in customers and build the long-term loyalty.

This study provides innovative empirical evidence by offering the first systematic study of the digital onboarding dimensions, that is, e-banking registration, service integration, as well as bank notification service, and their combined impact on customer experience in the field of banking in Nigeria in the post-COVID-19 era, specifically. Unlike the previous analytical research on the digital bank adoption that have used endogenous variables, the study is unique in disaggregating digital onboarding into three constructs of critical outcomes and proving their significant overall prediction ability (R^2 = 0.694), which is greater than the variance that has been explained within similar studies on developed financial markets. The findings show that digital onboarding is not only an operation

such a requirement but a multi-faceted strategic resource that could lead to cognitive and affective customer experience within the emerging financial ecosystems in Africa; integration of services in particular, proves to be the strongest predictor of customer experience. Context-specific insights make the digital experience theories more relevant to Sub-Saharan Africa contexts and also provide the replicable PLS-SEM approach to the investigation of digital service quality dimensions in different banking contexts in developing economies. Moreover, the post-COVID-19 analytical approach provides the basis of understanding the increased impact of the digital transformation on the customer experience in the largest African economy in due time.

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Взаємозв'язок між цифровим онбордингом та клієнтським досвідом у банківській галузі Нігерії: аналіз у постковідний період

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Сучасне фінансове середовище зазнало суттєвих трансформацій, прискорених глобальною пандемією COVID-19, що зумовило необхідність заміни фізичних банківських взаємодій цифровими альтернативами. У цій статті, крізь призму постпандемічного періоду, досліджуються взаємозв'язки між цифровим онбордингом та клієнтським досвідом у банківському секторі Нігерії.

Особливу увагу приділено аналізу впливу реєстрації в системах електронного банкінгу, інтеграції банківських сервісів та систем банківських сповіщень на якість клієнтського досвіду. Теоретичною основою дослідження стала Уніфікована теорія прийняття та використання технологій 2 (UTAUT2). Для збору емпіричних даних застосовано метод описового опитування із використанням структурованих анкет, які було запропоновано 377 активним клієнтам п'яти провідних комерційних банків Нігерії (Zenith Bank, Access Bank, First Bank, GTBank, UBA) у штаті Квара. Аналіз отриманих даних здійснювався за допомогою моделювання структурними рівняннями методом часткових найменших квадратів (PLS-SEM). Результати дослідження засвідчили, що найбільший вплив на клієнтський досвід має інтеграція сервісів ($\beta = 0{,}375$; $t = 11{,}341$; $p < 0{,}001$), далі - реєстрація в системах електронного банкінгу ($\beta = 0{,}340$; $t = 7{,}023$; $p < 0{,}001$) та банківські сповіщення ($\beta = 0{,}245$; $t = 5{,}785$;

$p < 0,001$). Сукупно зазначені складові цифрового онбордингу пояснюють 69,4 % варіацій клієнтського досвіду ($R^2 = 0,694$), що свідчить про високий прогностичний потенціал цифрового онбордингу як багатовимірного стратегічного ресурсу. Зроблено висновок, що цифровий онбординг є одним з ключових чинників формування позитивного клієнтського досвіду в банківській сфері Нігерії, виконуючи не лише операційну функцію, а й роль стратегічного каталізатора клієнтської взаємодії. Нігерійським банкам рекомендовано приділяти пріоритетну увагу вдосконаленню цифрового онбордингу шляхом розвитку інфраструктури інтеграції сервісів, спрощення процедур реєстрації в електронному банкінгу, а також упровадження точних, вчасних і персоналізованих систем сповіщення клієнтів.

Ключові слова: цифровий онбординг, клієнтський досвід, банківська галузь, COVID-19, реєстрація в електронному банкінгу, інтеграція сервісів, банківські сповіщення, фінансові технології, цифрова трансформація, PLS-SEM, Нігерія, UTAUT2.

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